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State Water Resources Control Board

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, ORDER NO. R4-2010-0108, 11-TC-01: COMMENTS OF STATE WATER RESOURCES CONTROL BOARD AND LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD ON TEST CLAIM

Dear Ms. Halsey:

The State Water Resources Control Board (State Water Board) and the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) (collectively, Water Boards) jointly file this opposition to Test Claim 11-TC-01 filed by the Ventura County Watershed Protection District and the County of Ventura (collectively, Claimants). This Test Claim arises from a federal permit issued by the Los Angeles Water Board in 2010 as Order No. R4-2010-0108, *Waste Discharge Requirements for Storm Water (Wet Weather) and Non-Storm Water (Dry Weather) Discharges From the Municipal Separate Storm Sewer Systems Within the Ventura County Watershed Protection District, County of Ventura and the Incorporated Cities Therein* (National Pollutant Discharge Elimination System (NPDES) Permit No. CAS004002) (hereinafter the 2010 Permit). Through the Test Claim filed with the Commission on State Mandates (Commission), Claimants seek reimbursement of estimated and other unspecified costs of implementing or complying with multiple requirements in the Permit.

I. INTRODUCTION

The Los Angeles Water Board issued the 2010 Permit pursuant to requirements in the federal Clean Water Act (CWA),¹ its implementing regulations, and guidance from the United States Environmental Protection Agency (U.S. EPA). The CWA prohibits discharges of pollutants to waters of the United States except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit.² In the CWA, Congress mandated that local agencies that discharge

¹ Federal Water Pollution Control Act (FWPCA; 33 U.S.C. §§ 1251 et seq.) The federal Act is referred to herein by its popular name, the Clean Water Act (CWA) and the code sections used are those for the CWA.

² See generally CWA § 402.

pollutants from their municipal separate storm sewer systems (MS4s)³ to waters of the United States apply for and receive NPDES permits regulating these discharges.⁴ Congress also mandated that local agencies prohibit discharges of most non-stormwater discharges through their MS4s to receiving waters.⁵ The non-stormwater prohibition is not subject to the maximum extent practicable (MEP) technical standard for stormwater discharges. Local agencies generally obtain a single system-wide MS4 permit for each inter-connected MS4.⁶ The U.S. EPA has authorized the State Water Board, including its nine regional water boards, to issue NPDES permits in lieu of issuance of these permits by U.S. EPA itself.

The Los Angeles Water Board issued Order No. R4-2010-0108 on July 8, 2010. The Permit regulates stormwater (wet weather) and non-stormwater (dry weather) discharges from the MS4s within the Ventura County Watershed Protection District, the County of Ventura, and the 10 incorporated cities within the County of Ventura (collectively, Permittees) to waters of the United States.⁷ The Permit includes prohibitions on discharges of non-stormwater into the Permittees' MS4s pursuant to the independent federal laws in the Clean Water Act.⁸ As required by federal statute and regulations, the Permit contains numerous requirements for the Permittees to take actions, known as Best Management Practices (BMPs), to reduce the flow of pollutants into surface waters within the Los Angeles Region in order to improve water quality. When it considered the Permit, the Los Angeles Water Board found that the requirements were necessary to meet the requirements of federal law and are based exclusively on federal law.⁹

³ Pursuant to 40 C.F.R. § 122.26(b)(8), “[a] municipal separate storm sewer system (MS4) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.”

⁴ CWA § 402(p); *NRDC. v. U.S. EPA* (9th Cir. 1992) 966 F.2d 1292, 1295-96.

⁵ CWA § 402(p)(3)(B)(ii).

⁶ *Id.*, subd. (p)(3)(B)(i).

⁷ These incorporated cities include Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura (Ventura), Santa Paula, Simi Valley, and Thousand Oaks.

⁸ CWA § 402(p)(3)(B)(ii).

⁹ See, e.g., 2010 Permit, Finding C.4 and Fact Sheet (Administrative Record for Order No. R4-2010-0108 (hereafter, “AR”), pp. F0001367-68, F0003240) (“The Regional Board has prepared this Order so that implementation of provisions contained in this Order by Permittees will meet the requirements of the federal NPDES regulations at 40 CFR 122.26”), Finding E.7 (AR, pp. F0001371-73) (“This Order implements federally mandated requirements under CWA § 402, and subdivisions (p)(3)(B) (33 U.S.C. § 1342(p)(3)(B))...To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions.”), Finding E.25 (AR, p. F0001380) (“Therefore, a 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4, or for practicable controls to reduce the discharge of pollutants to the maximum extent, as those requirements are mandated by federal law.”), Finding E.26 (AR, p. F0001380) (“The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in U.S. EPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA § 402(p)(3)(B)(ii) and (iii) and the related federal regulations. Consistent with federal law, all of the conditions in this permit could have been included in a permit adopted by U.S. EPA in the absence of the in lieu authority of California to issue NPDES permits.”), Finding E.27 (AR, p. F0001380) (“The Board finds that all requirements in this order are practicable.”); and Provision 4.A.1 (AR, p. F0001396) (“This Order and the provisions herein are intended to develop, achieve, and implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the

Article XIII B, Section 6 of the California Constitution provides, “[w]henver the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service.” In order to obtain reimbursement, the Claimants must show as a threshold matter that the state has imposed new programs or higher levels of service.¹⁰ They must prove either that: (1) the program must carry out a governmental function of providing services to the public, or (2) the requirements, to implement a state policy, impose unique requirements on local governments and do not apply generally to all residents and entities in the state.¹¹ The Claimants are not entitled to subvention if the costs are imposed as a result of federal mandates rather than state mandates, if they proposed the permit provisions, or if any additional costs beyond a federal mandate are *de minimis*. Finally, Claimants must establish that they are required to use tax monies to pay for implementation of Permit provisions.¹²

As explained in detail below, the Claimants are not entitled to subvention of costs for the provisions challenged through their Test Claim. They have not shown that the challenged provisions constitute new programs or higher levels of service or are unique to local agencies and one or more exceptions under mandates law applies to each challenged provision, precluding a finding that subvention of funds is required.

Since the Test Claim was originally filed in August 2011, the California Supreme Court decided *Department of Finance v. Comm’n on State Mandates* (2016) 1 Cal.5th 749, as modified on denial of rehearing (Nov. 16, 2016) (*Department of Finance*). The Supreme Court’s opinion was limited to a narrow issue: whether four conditions concerning trash receptacles and inspections in the 2001 Los Angeles County MS4 Permit (2001 LA MS4 Permit) required controls that would reduce the discharge of pollutants to the MEP, as required by the Clean Water Act.¹³

By contrast, the 2010 Permit reflects the Los Angeles Water Board’s findings and determinations that requirements in the Permit, including each of the challenged terms, were necessary to comply with the CWA and its implementing regulations and thus was based entirely on federal authority.¹⁴ The Supreme Court noted the absence of these findings in the 2001 LA MS4 Permit and further opined that such findings would be entitled to deference.¹⁵ In addition, the Supreme Court’s primary focus was the construction of MEP. This Test Claim raises the following legal questions or factually distinct circumstances that the Supreme Court did not address:

1. The Los Angeles Water Board found the permit requirements at issue in this Test Claim were federal mandates. “Had the Regional Board found when imposing the disputed permit conditions, that those conditions were the only means by which the maximum

discharge of pollutants in storm water to the MEP and not cause or contribute to exceedances of water quality standards for the permitted areas in the County of Ventura.”).

¹⁰ Cal. Const., Art. XIII B, § 6, subd. (a).

¹¹ *Ibid.*

¹² See Gov. Code, § 17556.

¹³ *Department of Finance v. Comm’n on State Mandates* (2016) 1 Cal.5th 749, 757, as modified on denial of rehearing (Nov. 16, 2016) (*Department of Finance*), citing CWA § 402(p)(3)(B).

¹⁴ See, *supra*, footnote 9.

¹⁵ *Department of Finance, supra*, 1 Cal.5th at p. 768.

extent practicable standard could be implemented, deference to the board's expertise in reaching that finding would be appropriate."¹⁶ Such findings are "case specific, based among other things on factual circumstances."¹⁷

2. The LA MS4 permittees and Los Angeles Water Board did not dispute that each of the four challenged requirements were a new program or higher level of service¹⁸ and none were contained in previous permits.¹⁹ That is not the case in this Test Claim as the Los Angeles Water Board contends that none of the challenged requirements is a new program or higher level of service.
3. There was no evaluation of whether the contested provisions were required by another independent federal mandate such as the mandate to effectively prohibit non-stormwater discharges into their MS4s or required by a total maximum daily load.
4. Unlike here, none of the four requirements evaluated by the Supreme Court were terms U.S. EPA included in any EPA-issued MS4 NPDES permits.²⁰
5. The Supreme Court did not evaluate whether the local government had the authority to levy fees or assessments pursuant to Government Code section 17556, subdivision (d).²¹
6. The Supreme Court did not consider the exception to unfunded state mandates for generally applicable requirements. The Permit's discharge requirements are generally applicable and do not impose "unique" obligations on municipal entities.²²
7. The Supreme Court did not evaluate the permittees' voluntary participation in the NPDES program.

As discussed below, the Supreme Court's November 16, 2016, modifications to its opinion underscore that the determination of whether a particular requirement exceeds the federal standards is a case-specific, factual determination.

¹⁶ *Ibid.*

¹⁷ *Ibid.*, fn. 15.

¹⁸ *Id.*, at p. 762.

¹⁹ *Id.* at pp. 760-61.

²⁰ *Id.* at pp. 761 and 771-72.

²¹ *Id.* at p. 761 [acknowledging that the Commission found that the local governments were not entitled to reimbursement because they had authority to levy fees to pay for the required inspections, an issue the Supreme Court did not review].

²² The Water Boards note that in several instances Claimants rely upon the Commission's prior findings in Statement of Decisions in *In re Test Claim on: Los Angeles Regional Water Quality Control Board Order No. 01-182, Case Nos. 03-TC-04, 03-TC-19, 03-TC-20, 03-TC-21* (July 31, 2009) and *In re Test Claim on San Diego Regional Water Quality Control Board Order No. R9-2007-0001, Case No. 07-TC-09* (March 26, 2010) as support for the arguments in the Test Claim. In considering the challenged Permit provisions, the Water Boards urge the Commission to recognize factual distinctions between the permits and the fact that challenges to the Commission's findings on mandates law matters in the Statement of Decisions have not yet been resolved by the courts. Specifically, the courts have not yet determined how, if at all, the *Department of Finance* decision affects that matter and numerous other issues were raised but not addressed by *Department of Finance*.

II. BACKGROUND

The Water Boards contend that the challenged provisions impose neither new programs nor higher levels of service on local governments. Should the Commission disagree, the Water Boards urge the Commission to find that one or more of the legislative or judicially recognized unfunded state mandates exceptions apply to preclude any findings of subvention. The Water Boards discuss all of the provisions and applicable exceptions below. In light of the Los Angeles Water Board's findings that permit provisions are necessary for the Claimants to meet the standards and requirements of the CWA and its implementing regulations and thus are based entirely on federal authority,²³ the principal question at issue will be to evaluate, with appropriate deference, whether the challenged provisions are federal mandates, as the Los Angeles Water Board determined when it adopted the Permit. The Water Boards elaborate on these issues below in both general and provision-specific discussions, but here provide some additional legal context for the Water Boards' decisions and issuance of MS4 permits under federal law.

A. Regulatory Overview of the Clean Water Act MS4 Program

In 1972, Congress extensively amended the federal Clean Water Act to implement a permitting system for all discharges of pollutants from "point sources" to waters of the United States.²⁴ The permits are issued pursuant to the National Pollutant Discharge Elimination System, and are known as "NPDES permits." The 1972 amendments allowed U.S. EPA to authorize states to issue these permits.²⁵ California was the first state in the nation to obtain such authorization.²⁶ In order to obtain this authorization, the California Legislature amended the Water Code, finding that the state should implement the federal law in order to avoid direct regulation by the federal government.²⁷ The California legislature mandated that California's permit program must ensure consistency with federal law.²⁸

The State Water Board and the nine regional water boards are the state agencies charged with implementing the federal NPDES program.²⁹ The State Water Board's regulations incorporate the U.S. EPA regulations implementing the federal permit program.³⁰ Therefore, both the CWA and U.S. EPA regulations are applicable to the permit program in California.³¹ In California, permits to

²³ See, *supra*, footnote 9.

²⁴ CWA §§ 301 and 402. "The term 'point source' means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return from irrigated agriculture." (CWA § 502(14).) The Claimants' MS4 is a point source. (40 C.F.R. § 122.26(b)(4).)

²⁵ CWA § 402(b).

²⁶ Since that time, forty-six other states have received U.S. EPA's approval to issue NPDES permits. The list of states with the U.S. EPA's approval to issue NPDES permits can be found at <https://www.epa.gov/npdes/npdes-state-program-information>. Idaho, Massachusetts, New Hampshire, New Mexico, the District of Columbia, and many U.S. territories do not have approved NPDES programs.

²⁷ Wat. Code, § 13370 *et seq.*, adding Chapter 5.5 to the Porter-Cologne Water Quality Control Act.

²⁸ *Id.*, § 13372.

²⁹ *Id.*, § 13370.

³⁰ Cal. Code Regs., tit. 23, § 2235.2.

³¹ The permits *may* also include additional state requirements. (Cal. Code Regs., tit. 23, § 2235.3; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.)

allow discharges into state waters are termed “waste discharge requirements.”³² When issuing permits for discharges to waters of the United States, the term “waste discharge requirements” is equivalent to the term “permit” in the CWA.³³ Thus, waste discharge requirements that the Water Boards issue for discharges to waters of the United States are NPDES permits under federal law. When the Los Angeles Water Board, a state agency, issues an NPDES permit in lieu of U.S. EPA, it must adopt as stringent a permit as the federal agency would have.³⁴

To ensure that state-authorized programs comply with the U.S. EPA’s mandates and federal law, the U.S. EPA maintains oversight and supervision of these programs. The state must provide the U.S. EPA with proposed permits and notice of any action related to a discharger’s permit application.³⁵ The U.S. EPA may object to a permit, finding that it violates the Clean Water Act’s requirements.³⁶ Should the U.S. EPA determine that a state program does not comply with federal NPDES program guidelines, it may withdraw approval for the state program.³⁷

The Clean Water Act prohibits the discharge of pollutants from point sources to waters of the United States, except in compliance with an NPDES permit.³⁸ In 1973, U.S. EPA issued regulations that exempted certain types of discharges from NPDES permit requirements that it determined at that time were administratively difficult to regulate, including stormwater runoff. The reason that such regulation was deemed difficult is that stormwater runoff is much more diffuse, discharging at numerous points across the landscape. It runs off urban streets, into gutters and drainage ways, and flows directly into streams, lakes, and the ocean.³⁹ This exemption was overruled in *Natural Resources Defense Council v. Costle* (1977),⁴⁰ which held that the exemption was illegal, and ordered U.S. EPA to require NPDES permits for stormwater discharges. In *Costle*, the court suggested innovative methods for permitting, including using general permits for numerous sources and issuing permits that “proscribe industry practices that aggravate the problem of point source pollution.”⁴¹ Where permits prescribe actions that dischargers must implement to prevent or reduce pollutant discharges, these requirements are commonly called “best management practices” (BMPs).⁴²

³² Wat. Code, § 13263.

³³ *Id.*, § 13374.

³⁴ CWA § 402(b).

³⁵ *Id.*, subd. (d)(1).

³⁶ *Id.*, subd. (d)(2).

³⁷ *Id.*, subd. (c)(3).

³⁸ CWA § 301(a). In general, “navigable waters” or “waters of the United States,” includes all surface waters, such as rivers, lakes, bays and the ocean. (CWA § 502.)

³⁹ The chief traditional categories of discharges subject to NPDES permits are industrial process wastewater and sanitary sewer effluent. Both of these discharges are typically processed in a treatment plant before they are discharged to surface waters.

⁴⁰ *Natural Resources Defense Council v. Costle* (1977) 568 F.2d 1369.

⁴¹ *Id.*, at 1380.

⁴² 40 C.F.R. § 122.2 (“Best management practices (“BMPs”) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of “waters of the United States.” BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.”).

Controlling MS4 discharges is important, because stormwater and non-stormwater discharges are one of the most significant sources of water pollution in the nation.⁴³ When stormwater flows over urban environs, it collects heavy metals, sediments, nutrients (nitrogen and phosphorus), trash and debris, petroleum products, untreated sewage, pesticides, and other toxic pollutants, which are then discharged to creeks, rivers, estuaries, and oceans.⁴⁴ In addition to stormwater, the MS4 collects non-stormwater runoff from urban activities such as street and vehicle washing, potable water system testing, and discharges from groundwater treatment programs. In addition to urban activities, illicit discharges and connections to MS4 are another source of non-stormwater discharges.⁴⁵ These non-stormwater discharges can also contain pollutants that impair the beneficial uses (e.g., recreation, habitat protection, etc.) of the nation's waters. While non-stormwater discharges are most obvious during dry periods and are seen as the water flowing in the gutters, they can and do occur year round.

Despite the *Costle* decision, U.S. EPA had not adopted regulations implementing a permitting program for stormwater runoff by 1987. That year, Congress amended the CWA, specifically requiring stormwater permits for industrial and municipal stormwater runoff.⁴⁶ The amendments require NPDES permits for a discharge from a MS4 serving a population of 100,000 or more.⁴⁷

The Clean Water Act contains three provisions specific to permits for MS4s: (1) permits may be issued on a system- or jurisdiction-wide basis; (2) permits must include a requirement to effectively prohibit non-stormwater discharges into storm sewers; and (3) permits must require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP), including management practices, control techniques and system, design and engineering methods, and such other provisions as the [permitting agency] determines appropriate for the control of such pollutants.⁴⁸ The state is required, by federal law, to select the BMPs.⁴⁹

On November 16, 1990, U.S. EPA published regulations addressing discharges of stormwater and non-stormwater from MS4s.⁵⁰ The regulations establish minimum requirements for MS4 permits and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in stormwater discharges to the MEP. However, the regulations also require the MS4's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer.⁵¹ "Illicit discharges" defined in the regulations is the most closely applicable definition of "non-storm water" contained in federal law, and the terms are often used interchangeably. The State Water Board has concluded that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's

⁴³ *Environmental Defense Center, Inc. v. EPA* (9th Cir. 2003) 344 F.3d 832, 840.

⁴⁴ *Id.* at pp. 840-841.

⁴⁵ *Ibid.*

⁴⁶ CWA § 402(p).

⁴⁷ *Id.*, subd. (p)(2)(C). U.S. EPA defines MS4s that serve a population over 250,000 as "large" MS4s. U.S. EPA issued regulations in 1999 extending permit requirements to small MS4s (those serving a population of less than 100,000).

⁴⁸ *Id.*, subd. (p)(3)(B).

⁴⁹ *NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292.

⁵⁰ 55 Fed. Reg. 47990 *et seq.* (Nov. 16, 1990).

⁵¹ 40 C.F.R. § 122.26(d)(2)(iv)(B).

provision requiring permits to ‘effectively prohibit non-storm water discharges.’⁵² The importance of this history is to emphasize that the starting point for the discussion of MS4 permits is that *all discharges of any substance other than stormwater are prohibited - completely.*

B. Overview of Legal Standards for MS4 Permits

The Clean Water Act does not provide a specific set of permit terms that the permitting agency must include in each MS4 permit. Rather, the CWA and U.S. EPA’s regulations require a permitting agency to determine what controls are necessary to meet federal requirements in a particular MS4 permit. The applicable legal standards that permitting authorities must meet when issuing MS4 permits are set forth in Clean Water Act section 402(p)(3)(B)(ii) and (iii) and require that MS4 permits:

(ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers, and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

Federal and state permitting agencies must comply with these legal standards.⁵³

To obtain coverage under an NPDES permit, federal regulations specify the information that applicants for MS4 permits must include in their applications that the permitting agency will be considering in issuing the permit.⁵⁴ For the large and medium MS4s, the application requirements are extensive. Applications:

shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. Separate proposed programs may be submitted by each coapplicant. Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. Proposed programs will be considered by the Director when

⁵² State Board Order WQ 2009-0008, p. 4 (withdrawn on other grounds); see also State Water Board Order WQ 2015-0075, p. 63 (“the illicit connection and illicit discharge elimination program is a means to implement the non-storm water prohibition and [is] independently implementable and enforceable”).

⁵³ CWA § 402(b). Included in this federal standard is the requirement that MS4 permits “shall . . . includ[e] . . . such other provisions as the Administrator or the State determines appropriate for the control of pollutants.” (CWA § 402(p)(3)(B)(iii).) The word “shall” modifies compliance with MEP as well as this latter clause. Thus, in addition to requiring controls to reduce the discharge of pollutants to the MEP, this provision requires the Los Angeles Water Board, when appropriate, to include provisions that go beyond MEP. The provisions contested in this Test Claim, however, concern only the non-stormwater discharge prohibition and the MEP standard.

⁵⁴ 40 C.F.R. § 122.26(a)(4). U.S. EPA regulations have varied requirements depending on the size of the population served by the MS4. A “large” MS4 serves a population of 250,000 or more. (40 C.F.R. § 122.26(b)(4).) Collectively, Claimants and the 10 cities regulated by the Permit exceed the minimum population for a large MS4.

developing permit conditions to reduce pollutants in discharges to the maximum extent practicable.⁵⁵

The federal regulations also require, among other elements, that a proposed management program must address oversight of discharges into the MS4 from the general population, and from industrial and construction activities within its jurisdiction and shall include “[a] description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls.”⁵⁶ Permit applications must also describe programs for education and outreach to the general public, and to certain categories of municipal workers.⁵⁷ U.S. EPA has made clear that permit terms must be “clear, specific, and measurable.”⁵⁸

The Federal MEP Standard

The maximum extent practicable or “MEP” standard is akin to a technology-based standard and was first established in the Clean Water Act in 1987. The fundamental requirement that municipalities reduce pollutants in MS4s to the MEP remains a cornerstone of the mandate imposed on municipalities by the federal Clean Water Act and implementing NPDES regulations. Meeting the MEP standard is generally a result of emphasizing robust pollution prevention through various programs and structural measures, with treatment methods serving as additional lines of defense. These pollution prevention methods require municipalities take actions that will lessen the incidence of pollutants entering the storm drains by regulating the behavior and practices of the municipalities, their residents, and their businesses.⁵⁹

The MEP approach is an ever evolving, flexible and advancing concept, which considers technical and economic feasibility. As knowledge and technology regarding controlling stormwater runoff continues to evolve, so too must the actions that are taken to comply with the standard. In addition to regulations, U.S. EPA has issued guidance documents that discuss the type of BMPs that should be included in MS4 permits in order to reduce the discharge of pollutants in stormwater to the MEP.⁶⁰ Successive permits issued to MS4 dischargers thus require greater levels of specificity over time in defining what constitutes MEP. This is consistent with Congress’ intent that state management programs evolve based on changing conditions from program development and

⁵⁵ *Id.*, subd. (d)(2)(iv).

⁵⁶ *Id.*, subd. (d)(2)(iv)(A).

⁵⁷ *Id.*, subds. (v)(A)(6), (B)(6), (C)(4); see also, 40 C.F.R. § 122.34(b)(1), establishing public education and outreach as a minimum control measure for small MS4s. The initial requirements for small MS4s were considered to be less stringent than those for Phase I MS4s, such as Permittees. (64 Fed. Reg. 68722 (Dec. 8, 1999).)

⁵⁸ See generally 81 Fed. Reg. 89320 (Dec. 9, 2016).

⁵⁹ There may also be engineered solutions, and there are some in Ventura County, but it is important to keep in mind that there is no single engineered storm sewer treatment plant as there is for other types of discharges such as sanitary sewage.

⁶⁰ See, e.g., MS4 Permit Improvement Guide (Apr. 2010) (AR, pp. F004439-557). Prior to issuance of the MS4 Permit Improvement Guide, U.S. EPA provided BMP “menus” for the required elements of a MS4 permittee’s stormwater management program as required by 40 C.F.R. § 122.26(d)(2)(iv).

implementation and corresponding improvements in water quality.⁶¹ This is also consistent with the U.S. EPA's guidance that successive permits for the same MS4 must become more refined and detailed. The MEP standard, which the Los Angeles Water Board found the permit provisions necessary to meet in this case, is discussed in more detail below as relevant to challenged permit provisions.

The Federal Prohibition on Non-Stormwater Discharges

Wholly independent from the MEP standard is the Clean Water Act requirement that MS4 permittees effectively prohibit non-stormwater discharges to their MS4s.⁶² Under Clean Water Act section 402(p)(3)(B)(ii), permitting agencies must ensure that permits for MS4 discharges include requirements necessary to "effectively prohibit non-stormwater discharges into the storm sewers." U.S. EPA has defined "storm water" to mean "stormwater runoff, snow melt runoff and surface runoff and drainage."⁶³ While "non-stormwater" is not defined in the CWA or federal regulations, the federal regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from firefighting activities)."⁶⁴ This definition is the most closely applicable definition of "non-stormwater" contained in federal law. Non-stormwater discharges are generally considered dry weather discharges. In general, the requirement to "effectively prohibit" non-stormwater discharges requires MS4 owners and operators to prohibit flows to the MS4s by implementing a program to detect and remove illicit discharges, or by requiring a discharger to obtain a separate NPDES permit for the non-stormwater discharge into the storm sewer.⁶⁵

C. Overview of Ventura County MS4 Permit Development

As described in detail below, the Los Angeles Water Board first issued a permit to Claimants and the other Ventura County MS4 Permittees in 1994 ("1994 Permit"). The Board modified and reissued the permit in 2000 ("2000 Permit"), 2009 ("2009 Permit"), and 2010 ("2010 Permit"). The 2010 Permit is the subject of the Test Claim filed by the Claimants.

⁶¹ Federal regulations and companion U.S. EPA guidance convey the expectation that the level of specificity in a permit reconsidered and reissued every five years will increase over time whereby each successive permit becomes more refined, detailed, and expanded as needed, based on experience under the previous permit. (See, Letter from U.S. EPA, Alexis Strauss, to State Water Board, April 10, 2008, concerning Los Angeles County Copermittee Test Claims Nos. 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (AR, pp. A003789-91), citing 55 Fed. Reg. 47990, 48052 ("EPA anticipates that storm water management programs will evolve and mature over time."); 64 Fed. Reg. 68722, 68754; Dec. 8, 1999) ("EPA envisions application of the MEP standard as an iterative process."); and Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits (Sept. 1, 1996) ("The interim permitting approach uses BMPs in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards."))

⁶² State Water Board Order WQ 2015-0075 (2012 LA County MS4 Permit), pp. 62-63, confirming that non-stormwater discharges through the MS4s under the Clean Water Act are not subject to the MEP standard applicable to stormwater discharges.

⁶³ 40 C.F.R. § 122.26(b)(13).

⁶⁴ *Id.*, subd. (b)(2).

⁶⁵ *Id.*, subd. (d)(2)(iv)(B). See also 55 Fed. Reg. 47990, 47995 ["Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."].

In 1994, pursuant to the CWA amendments of 1987, the Los Angeles Water Board issued the first term system-wide MS4 permit for Ventura County to the Claimants and the 10 incorporated cities within Ventura County.⁶⁶ The Permittees' joint application for a MS4 permit had proposed program work plans for the initial implementation phase of their Countywide Stormwater Quality Management Program (SWMP) and a monitoring program.⁶⁷ The Claimants and the cities chose to collaborate in a countywide group, to pool resources and expertise, and share information, public outreach and monitoring costs, among other tasks.⁶⁸ The focus of the 1994 Permit was to require Ventura County municipalities to develop and implement a SWMP in the areas of public involvement/education; business/industry outreach; development planning; development construction; public agency activities; and illicit connection/discharge elimination in order to ensure the prohibition on non-stormwater discharges entering the MS4 and the reduction of pollutant discharges in stormwater to the maximum extent practicable. In addition, the 1994 Permit required Permittees to implement a basic monitoring program to characterize the quality of MS4 discharges.

The Los Angeles Water Board issued the second-term MS4 permit in 2000.⁶⁹ The focus of the 2000 Permit was the continued prohibition of non-stormwater discharges and the implementation of a comprehensive stormwater management program with the dual objectives of reducing pollutant discharges in stormwater to the maximum extent practicable and ensuring that pollutant discharges in stormwater did not cause or contribute to an exceedance of water quality standards. The 2000 Permit also expanded the monitoring program to assess mass emissions of pollutants from the rivers in Ventura County to coastal waters and to understand better the quality of MS4 discharges and their adverse impacts.

Yet, more than a decade after the first permit was issued, water quality impacts from MS4 discharges remained. While Ventura County municipalities made significant strides in implementing programs to reduce stormwater pollution, exceedances of water quality standards for stormwater pollutants such as bacteria and heavy metals continued. As required by federal law, the Permittees submitted a reapplication package for the third-term permit in January 2005.⁷⁰ The Permittees' 2005 reapplication package contained a proposed Storm Water Management Program and a Monitoring Program for the Board to consider for incorporation into the 2009 Permit as permit conditions and to demonstrate compliance with federal law.

⁶⁶ Order No. 94-082 (AR, pp. F003456-70.)

⁶⁷ See AR, pp. F003326-F003455.

⁶⁸ The Ventura County Board of Supervisors approved the concept of a countywide NPDES permit program and the use of the Flood Management District (presently the Watershed Protection District) benefit assessment authority to finance it on April 14, 1992. On June 30, 1992, the Ventura County Board of Supervisors adopted a benefit assessment levy for stormwater and flood management in the unincorporated areas of Ventura County and the cities within the County, to be used in part to finance the implementation of a countywide NPDES municipal storm sewer permit program. The Ventura County MS4 Permittees have entered into an agreement with the Watershed Protection District to finance the activities related to the Ventura County MS4 permit for shared and district wide expenses. The Permittees are also given the option to use the Benefit Assessment Program to finance their respective activities related to reducing the discharge of stormwater pollutants under the MS4 permit. (2010 Permit, Finding A.4 (AR, p. F0001357).)

⁶⁹ Order No. 00-108 (AR, pp. F004036-4119.)

⁷⁰ See Report of Waste Discharge (AR, pp. A17840-913).

On May 7, 2009, the Los Angeles Water Board issued Order No. 09-0057 (2009 Permit), which became effective on August 5, 2009.⁷¹ The 2009 Permit was based on the Permittees' application and the 2000 Permit, with revisions and additions necessary to meet minimum federal requirements. The 2009 Permit identified a more refined and detailed set of specific stormwater BMPs that MS4 permittees must implement in six categories to reduce the discharge of pollutants from their MS4s. The 2009 Permit promoted the implementation of low impact development ("LID") strategies for new development and redevelopment, which have the objective of maintaining pre-development hydrology and utilizing natural controls to reduce stormwater pollutants. For the first time, the permit also included additional requirements to implement wasteload allocations identified in Total Maximum Daily Loads (TMDLs) for impaired waterbodies, as required by federal regulations. Additionally, during the drafting of the 2009 Permit, the Permittees along with Heal the Bay and the Natural Resources Defense Council came to consensus regarding certain provisions of the permit, namely those related to the Planning and Land Development program, Municipal Action Levels (MALs), and shoreline monitoring. The Permittees and environmental organizations presented proposed language consistent with their agreement to the Board and requested it be included in the permit.⁷² At the Los Angeles Water Board hearing on May 7, 2009, the Permittees, NRDC, and Heal the Bay reiterated their support for the agreement and advocated that it be incorporated into the permit in its entirety, which the Board did.

On June 8, 2009, several building association entities petitioned the State Water Board for review of the 2009 Permit alleging procedural deficiencies in the process by which the Los Angeles Water Board issued the 2009 Permit.⁷³ On March 10, 2010, the State Water Board requested that the Los Angeles Water Board agree to a voluntary remand of the 2009 Permit in order to address the perceived procedural issues.⁷⁴ The State Water Board also requested that the building association entities agree to place their petition in abeyance.⁷⁵ On March 11, 2010, the Los Angeles Water Board agreed to a voluntary remand and stated its intent to hold a hearing to reconsider the permit in July 2010.⁷⁶ On March 15, 2010, the Ventura County MS4 permittees requested that the Los Angeles Water Board enter into a stipulated stay of the 2009 Permit, in particular Part 4.E. (Planning and Land Development Program), which required submittal of an update to the Technical Guidance Manual by May 7, 2010.⁷⁷ The building association entities also stated that they would be willing to withdraw their petition with the State Water Board if the Los Angeles Water Board would stipulate to a stay of Part 4.E.⁷⁸ NRDC and Heal the Bay opposed any stay of the provisions.⁷⁹ On March 25, 2010, the Los Angeles Water Board declined to enter into a stipulated stay of any provisions of the 2009 Permit, including Part 4.E., stating "until the

⁷¹ Order No. 09-0057 (See AR, pp. E0001834-2054). The 2009 Permit took effect 90 days from adoption. (Finding G.4., AR, p. E001879.)

⁷² See April 10, 2009 Letter from the Ventura County MS4 Permittees, Heal the Bay, and NRDC to Chair Lutz and Board Members (AR, pp. E0001229-35); see also 2010 Permit, Finding B.28 (AR, pp. F0001364-65).

⁷³ SWRCB Administrative Record, pp. SB-AR-001 to 032.

⁷⁴ SWRCB Administrative Record, pp. SB-AR-589 to 592.

⁷⁵ *Ibid.*

⁷⁶ SWRCB Administrative Record, p. SB-AR-593.

⁷⁷ AR, pp. F003318-19.

⁷⁸ SWRCB Administrative Record, pp. SB-AR-601 to 602.

⁷⁹ AR, pp. F003320-23.

Los Angeles Water Board takes further action on the Ventura County MS4 Permit (which is currently scheduled for July 8, 2010), *the existing permit, including all of its provisions, remain in full force and effect.*⁸⁰ Further, since the building association entities declined to place their petition in abeyance and it was dismissed by operation of law on March 29, 2010.⁸¹

On May 5, 2010, the Los Angeles Water Board issued a Notice of Public Hearing to “consider whether to affirm Order No. 09-0057 that was previously adopted on May 7, 2009.”⁸² The Board indicated the scope of the hearing was narrow and that it would accept comments and evidence only on the portions of the permit that related to the agreement that the Permittees, NRDC, and Heal the Bay advocated for, as well as minor changes to correct typographical errors or to provide greater clarity on non-agreement related provisions.⁸³

After a public hearing on July 8, 2010, the Los Angeles Water Board issued Order No. R4-2010-0108 (2010 Permit).⁸⁴ The requirements in the 2010 Permit are virtually the same as those in the 2009 Permit.⁸⁵ While most of the contested provisions are identical, the only difference in the other provisions was extending the applicable deadline to provide additional time for the Permittees to comply.⁸⁶ The 2010 Permit became effective immediately upon adoption by the Los Angeles Water Board.⁸⁷ No petition was filed with the State Water Board challenging the 2010 Permit.

On August 26, 2011, over 13 months after the 2010 Permit took effect, Claimants filed this Test Claim.

III. OVERVIEW OF MANDATES LAW

Article XIII B, Section 6, of the California Constitution requires subvention of funds to reimburse local governments for state-mandated programs in specified situations. There are several exceptions and limitations to the subvention requirements that provide bases for the Commission to determine that the Test Claim is not subject to subvention. Article XIII B, Section 6 provides, “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service.” Implementing statutes clarify that no subvention of funds is required if: (1) the mandate imposes a requirement that is mandated by a federal law or regulation and results in costs mandated by the federal government, unless the statute or executive order mandates costs that exceed the mandate in that federal law

⁸⁰ AR, p. F003324 (Emphasis added.)

⁸¹ SWRCB Administrative Record, p. SB-AR-609.

⁸² AR, pp. F000001-03.

⁸³ *Ibid.*

⁸⁴ Order No. R4-2010-0108 (AR, pp. F0001349-548).

⁸⁵ See AR, pp. F000290-423. The addition of the language shown on pp. F000354-356 reflects the agreement made among the Ventura County MS4 Permittees, Heal the Bay, and NRDC in 2009.

⁸⁶ In one case, the provision was simply moved from one location to another within the Permit.

⁸⁷ 2010 Permit, Finding G.4 (AR, p. F0001387) (“This Order...shall take effect on (Order adoption date) provided the Regional Administrator of the U.S. EPA has no objections.”).

or regulation;⁸⁸ or (2) the local agency proposed the mandate;⁸⁹ or (3) the local agency has the authority to levy service charges, fees, or assessments sufficient to pay.⁹⁰

Numerous judicial decisions have further defined limitations on the requirements for subvention of funds. Specifically, subvention is only required if expenditure of tax monies is required, and not if the costs can be reallocated or paid for with fees.⁹¹ In addition, reimbursement to local agencies is required only for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. Laws of general application are not entitled to subvention.⁹² The fact that a requirement may single out local governments is not dispositive; where local agencies are required to perform the same functions as private industry, no subvention is required.⁹³

IV. The Commission Lacks Jurisdiction Over This Test Claim Because It Was Not Timely Filed

As a threshold matter, the Commission lacks jurisdiction over this Test Claim because it was not timely filed by Claimants within 12 months of the effective date of the 2010 Permit. The 2010 Permit took effect on July 8, 2010 and Claimants filed this Test Claim over 13 months later on August 26, 2011. The Claimants have the burden of demonstrating the timeliness of any test claim it files with the Commission. Claimants have not met that burden here.

In its letter dated March 3, 2017, the Commission notified the Claimants that the joint test claim filed on August 26, 2011 was incomplete. The Commission correctly stated the filing was incomplete, in part, as it “was filed beyond the statute of limitation because it was filed more than 12 months beyond the effective date of the Order.” Government Code section 17551(c) requires a local agency to file a test claim “not later than 12 months following the effective date of a statute or executive order, or within 12 months of incurring increased costs as a result of a statute or executive order, whichever is later.” The Claimants were, however, provided an opportunity to cure their filing, which they attempted to do in a revised filing on May 17, 2017.

In their revised filing, Claimants continue to rely on an incorrect assertion that the effective date of the 2010 Permit is “on or about August 27, 2010,” citing the NPDES Memorandum of Agreement (“MOA”) between the U.S. Environmental Protection Agency (U.S. EPA) and the California State Water Resources Control Board.⁹⁴ Claimants use this assertion for its sole basis as having met the 12-month requirement. Claimants, however, ignore the fact that the 2010 Permit clearly states that it “shall take effect on (Order adoption date) provided the Regional

⁸⁸ Govt. Code, § 17556, subd. (c).

⁸⁹ *Id.*, subd. (a).

⁹⁰ *Id.*, subd. (d).

⁹¹ *County of Los Angeles v. Commission on State Mandates* (2003) 110 Cal.App.4th 1176; *Redevelopment Agency v. Commission on State Mandates* (1997) 55 Cal.App.4th 976.

⁹² *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46.

⁹³ *City of Richmond v. Commission on State Mandates* (1998) 64 Cal.App.4th 1190.

⁹⁴ Test Claim, p. 1, fn 2. In their Test Claim, Claimants do not allege timeliness on the basis of it being filed within 12 months of incurring increased costs. In the event Claimants attempt to revise their filing to raise this claim, the Commission should reject such attempts. Claimants have already been provided with one opportunity to revise its filings on this issue and chose to ignore the clear language in the Permit concerning the effective date.

Administrator of the U.S. EPA has no objections.”⁹⁵ There is no dispute that the 2010 Permit was adopted by the Los Angeles Water Board on July 8, 2010.⁹⁶ And, as Claimants correctly note, U.S. EPA did not object to the Permit. Thus, the effective date of the 2010 Permit was July 8, 2010.⁹⁷

The Los Angeles Water Board’s decision to have the 2010 Permit take effect immediately upon adoption was intentional. Claimants’ reliance on the NPDES MOA between U.S. EPA and the State Water Board is also entirely misplaced as it ignores the context in which the Order was adopted. As described in Section II.C., above, the Los Angeles Water Board specifically declined to stay certain provisions of the 2009 Permit, stating “until the Los Angeles Water Board takes further action on the Ventura County MS4 Permit (which is currently scheduled for July 8, 2010), *the existing permit, including all of its provisions, remain in full force and effect.*”⁹⁸ It was not necessary for the Board to delay the effective date of the 2010 Permit as the requirements in the 2010 Permit are virtually the same as those in the 2009 Permit. Thus, the Permittees had been subject to those same provisions since the effective date of the 2009 Permit and had already been implementing the provisions and, notably, incurring costs to implement those provisions. Moreover, the reconsideration of the permit in 2010 was to allow public comment on the very language that the Permittees, NRDC, and Heal the Bay proposed and advocated for.

As the Commission correctly noted in its March 3, 2017 letter to the Claimants, “there is nothing in the record to support a finding of a delayed effective date” and neither Claimants nor the Commission can legally ignore the effective date established by the Los Angeles Water Board in the Permit it adopted. To the extent that Claimants believe the Los Angeles Water Board’s established effective date was contrary to the NPDES MOA with U.S. EPA, Claimants could have raised this issue before the Los Angeles Water Board and, if dissatisfied with the response, filed a petition with the State Water Board challenging the effective date.⁹⁹ It did neither. The Commission is not the proper forum for Claimants to challenge the effective date.

State law is clear that the Commission may only review a test claim if the test claim is timely filed.¹⁰⁰ Here, the Test Claim was not timely filed because it was filed on August 26, 2011, which is beyond the statute of limitations in Government Code section 17551. Therefore, the Commission, by statute, does not have jurisdiction over this Test Claim.

⁹⁵ 2010 Permit, Finding G.4 (AR, p. F0001387).

⁹⁶ 2010 Permit, Certification (AR, p. F0001480).

⁹⁷ The District has even acknowledged that the 2010 Permit became effectively immediately upon adoption. See Ventura County Watershed Protection District, Report on Benefit Assessment Program for Watershed Protection: Fiscal Year 2010/2011, p. 4 (“The LA Water Board Permit voluntarily remanded and reissued the Permit on July 8, 2010 as NPDES Permit No. CAS004002/Order No. 10-108 (Permit). This Permit became immediately effective upon adoption and is also considered the third term Permit.”).

⁹⁸ AR, p. F003324 (Emphasis added.)

⁹⁹ Wat. Code, § 13320.

¹⁰⁰ Gov. Code, § 17551(b).

V. THE CHALLENGED PERMIT PROVISIONS DO NOT IMPOSE NEW PROGRAMS OR REQUIRE HIGHER LEVELS OF SERVICE AND APPLICABLE MANDATES EXCEPTIONS PRECLUDE SUBVENTION—GENERAL RESPONSES

Claimants contend that the 2010 Permit imposes numerous new programs or requires higher levels of service than previously required and that all of the activities for which they seek reimbursement exceed federal law. They also assert that the provisions are uniquely imposed on local government and they are unable to assess a fee to recover the costs of the mandated activities. As a threshold matter, no appellate court has determined that the Test Claim provisions, or similar provisions in other permits, impose new programs or higher levels of service within the context of mandates law.¹⁰¹ Because many of the Water Boards' responses concerning applicable mandates law apply to all of the challenged provisions, the Los Angeles Water Board has endeavored to avoid repetition by responding generally to these assertions below. If the Commission finds the Test Claim timely filed, these general responses alone support denial of each of Claimants' challenges. Where appropriate, the Water Boards provide additional support for the conclusion that exceptions apply to specific challenged provisions, in Section VI, below.

Even if the Commission finds that some of the challenged provisions do impose a new program or higher level of service, as explained below, the challenged provisions are nonreimbursable because of applicable mandates exceptions. The Claimants, as well as the other Ventura MS4 permittees, proposed concepts on which many of the challenged permit requirements are based in their permit application, or report of waste discharge (ROWD) or in the permitting process for their requested permit. The Los Angeles Water Board found that the challenged provisions were adopted entirely under federal law and are necessary to implement the MEP standard and other independent federal law requirements. Therefore none of the costs are for activities exceeding federal requirements. Claimants are not *required* to use taxes to pay for the costs for the programs. They can be paid for by levying fees especially enacted for stormwater programs. The local agencies have not established that tax monies are required.¹⁰²

Additionally, compliance with NPDES permits, and specifically permits regulating stormwater discharges, is required of private industry as well as state and federal government agencies. Local government is not singled out. And, in fact, the requirements for industrial entities are more stringent than for local government dischargers because industrial entities are required to strictly comply with water quality standards. Similarly, private industry and governmental agencies, like municipalities, are required to control non-stormwater discharges from their facilities. Finally, if the Commission determines that a portion of the MS4 operators' activities exceed federal law

¹⁰¹ No appellate court has addressed what constitutes a new program or higher level of service in the context of MS4 permits. The issue was raised in the State Water Board, San Diego Regional Water Quality Control Board, and Department of Finance's Petition for Writ of Mandate regarding the Commission's Statement of Decision in Test Claim No. 07-TC-09 (re: San Diego Regional Water Quality Control Board Order No. R9-2007-0001), which is currently on appeal. The Court of Appeal has set oral argument in that matter for November 20, 2017.

¹⁰² As mentioned in the Introduction, no appellate court has addressed what constitutes fee authority in the context of MS4 permits, particularly with consideration of Proposition 218. The Commission has not considered the later approved Proposition 26. In their petition for writ of mandate in *State of California, Department of Finance, et al., v. Commission on State Mandates*, Sacramento County Superior Court, Case No. 34-2010-80000604, the State Water Board, San Diego Regional Water Quality Control Board, and Department of Finance challenged the Commission's conclusion in the underlying Statement of Decision on Test Claim No. 07-TC-09 that the requirement for voter approval as prerequisite to raising fees precluded finding that a local agency has fee authority to pay for some permit-related activities. Likewise, the claimants in that matter filed a cross-petition challenging the sufficiency of the evidence supporting the Commission's underlying determination that local agencies have authority to fund hydromodification and low impact development programs through their land development programs. The Court of Appeal has set oral argument in that matter for November 20, 2017.

requirements and would otherwise qualify for subvention, the costs are *de minimis* and therefore not reimbursable.

A. The Contested Provisions Do Not Impose New Programs or Higher Levels of Service

Claimants have not established that the contested provisions impose a new program or higher level of service.

1. The “Prior Permit” is the 2009 Permit, Not the 2000 Permit

In an effort to demonstrate that the 2010 Permit imposes new programs or higher levels of service, Claimants compare the requirements of the 2010 Permit to the 2000 Permit. In so doing, Claimants assume that the 2000 Permit is the “prior permit.” Claimants, however, completely ignore the fundamental fact that it was the 2009 Permit that was the prior permit. Therefore, Claimants’ comparison of the 2010 Permit against the 2000 Permit is the incorrect comparison. The proper comparison for the Test Claim is to compare the 2010 Permit to the 2009 Permit.

From August 25, 2009 to July 7, 2010, the 2009 Permit was the effective MS4 permit for Ventura County.¹⁰³ Thus, when the Board adopted the 2010 Permit on July 8, 2010, the Permittees had already been subject to the requirements of the 2009 Permit for over 10 months (and in many cases already implementing its terms).¹⁰⁴ Despite any claims Claimants may try to make, the Los Angeles Water Board never voided the 2009 Permit or any of its provisions. And, prior to adoption of the 2010 Permit, and in response to requests made by the Permittees (including Claimants), the Board specifically refused to stay any of the provisions of the 2009 Permit, stating “until the Los Angeles Water Board takes further action on the Ventura County MS4 Permit (which is currently scheduled for July 8, 2010), *the existing permit, including all of its provisions, remain in full force and effect.*”¹⁰⁵ Further, when it adopted the 2010 Permit, the Board made clear that “[e]xcept for enforcement purposes, Regional Water Board Order No. 09-0057 is hereby terminated.”¹⁰⁶ If Claimants believed that any of the provisions in the 2009 Permit constituted unfunded state mandates, it was required to file a test claim on the 2009 Permit. It did not. Rather, Claimants’ Test Claim solely concerns the 2010 Permit.

As previously explained, the requirements in the 2010 Permit are virtually the same as those in the 2009 Permit, including each of the contested provisions.¹⁰⁷

¹⁰³ As previously noted, the 2009 Permit took effect 90 days from adoption. (2010 Permit, Finding G.4., AR, p. E001879. (See also Letter from Ventura Countywide Stormwater Management Program to the Los Angeles Water Board, dated June 4, 2010, expressing appreciation to Board staff for efforts over the prior year meeting and discussing “the currently effective permit, Order No. 09-0057.” (AR, pp. F000785.)

¹⁰⁴ See, e.g., Letter from Ventura Countywide Stormwater Management Program to the Los Angeles Water Board, dated June 4, 2010, noting that since adoption of the 2009 Permit, the Permittees have accomplished many tasks, including submittal of the Revised Technical Guidance Manual for New and Re-Developments and submittal and implementation of a Youth Outreach Plan. (AR, pp. F000785.)

¹⁰⁵ AR, p. F003324 (Emphasis added.)

¹⁰⁶ 2010 Permit, Part 7.R.1. (AR, p. F0001479.)

¹⁰⁷ See AR, pp. F000290-423. The addition of the language shown on pp. F000354-356 reflects the agreement made among the Ventura County MS4 Permittees, Heal the Bay, and NRDC in 2009. Compare the contested provisions in the 2009 Permit to the 2010 Permit: AR pp. E001892 to F0001398 (Part 4.C.2(c)(1)(C)); E001893 to F0001398 (Part 4.C.2(c)(2)); E001893 to F0001399 (Part 4.C.2(c)(6)); E001894 to F0001399 (Part 4.C.2(c)(8)); E001894 to F0001399 (Part 4.C.2(d)); E001894 to F0001399-400 (Part 4.C.3(a)(1)); E001895 to F0001400 (Part 4.C.3(b)(1)); E001938 to

Thus, when properly comparing the contested provisions in the 2010 Permit to the 2009 Permit, it is clear that the 2010 Permit does not impose new programs or higher levels of service. On this basis alone, the Commission should deny the Test Claim in its entirety.

2. The 2010 Permit Does Not Impose a New Program

Under mandates law, a program is defined as “a program which carries out the ‘governmental function of providing services to the public, or laws which, to implement a state policy, impose unique requirements on local governments and do not apply generally to all residents and entities in the state.’”¹⁰⁸ A program is “new” if the local government had not previously been required to institute it.¹⁰⁹ Here, even if each of the challenged provisions could be considered a “program,” none meets the definition of “new.” Claimants had been permitted under the NPDES program implementing MS4 programs for 16 years, since 1994, at the time the 2010 Permit was adopted. Like the 2010 Permit, prior MS4 permits included management program requirements, monitoring programs, annual reporting requirements, land development requirements, enforcement obligations, discharge prohibitions, and the requirement to comply with receiving water limitations through an iterative process.¹¹⁰

3. The 2010 Permit Does Not Impose Higher Levels of Service

The changes to the requirements of prior permits (e.g., increased detail or specificity) also do not amount to a higher level of service, both because equivalent changes are applicable to non-municipal permittees, discussed in Section VI, below, and because they are merely refinements of existing requirements.¹¹¹ A higher level of service is not simply any increase in costs. “If the Legislature had intended to continue to equate ‘increased level of service’ with ‘additional costs,’ then the provision would be circular: ‘costs mandate by the state’ are defined as ‘increased costs’ due to an increased level of service, which, in turn would be defined as ‘additional costs.’”¹¹² Costs for purposes of Article XIII B, Section 6 do “not equal every increase in a locality’s budget resulting from compliance with a new state directive.”¹¹³

Nor does every increase in specificity about where to direct costs amount to a higher level of service.¹¹⁴ That the level of specificity in a permit reconsidered and reissued every five years may have changed over time is consistent with U.S. EPA’s guidance that MS4 permitting follow an

F0001442 (Part 4.I.1); E001889 to F0001395 (Part 3.E.1(e)); E002048-49 to F0001509-510 (Attachment F, Part F.1-2); E001916-17 to F0001421-22 (Part 4.E.IV.4); E001911-12 to F0001413-14 (Part 4.E.III.2(c)(3)-(4)); E001890-91 to F0001396-97 (Part 4.B); E001930 to F0001434 (Part 4.G.I.3(a)); and E001936 to F0001441 (Part 4.H.I.3(a)(1)(A)).

¹⁰⁸ *County of Los Angeles v. Comm’n on State Mandates* (2003) 110 Cal.App.4th 1176, 1189 [citing *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 56].

¹⁰⁹ *Ibid.*

¹¹⁰ See, Los Angeles Water Board Order Nos. 94-082 (AR, pp. F003456-73), 00-108 (AR, pp. F004036-119), and 09-0057 (AR, pp. E001834-977), all issued to Ventura County MS4 Permittees in the Los Angeles Region.

¹¹¹ See *County of Los Angeles v. Comm’n on State Mandates*, *supra*, 110 Cal.App.4th at pp. 1189-1190.

¹¹² *Id.*, at p. 1191.

¹¹³ *Id.*, at p. 1194; accord *San Diego Unified School Dist. v. Comm’n on State Mandates* (2004) 33 Cal.4th 859, 876-877.

¹¹⁴ See *Id.*, at p. 1194 [requiring local law enforcement agencies devote some of their training budgets to domestic violence training was not a higher level of service].

iterative process whereby each successive permit becomes more refined, detailed, and expanded as needed, based on experience under the previous permit.¹¹⁵

Rather, the costs incurred must involve programs previously funded exclusively by the state.¹¹⁶ The “state must be attempting to divest itself of its responsibility to provide fiscal support for a program, or forcing a new program on a locality for which it is ill equipped to allocate funding.”¹¹⁷

Claimants do not contend that the state has shifted any costs to local government or that they have been saddled with entirely new obligations to control pollution in MS4 stormwater and non-stormwater discharges. Without any burden shifting from the state to municipalities, mere direction from the Los Angeles Water Board that the municipalities reallocate some of their resources in a particular way does not amount to a higher level of service.¹¹⁸ “Loss of flexibility does not, in and of itself, require the [local agencies] to expend funds that previously had been expended by the State.”¹¹⁹

In this case, any costs arising from the 2010 Permit’s requirements do not result from a “new” program. Nor do they result from a “higher level of service,” because the state has not shifted its own responsibilities to local agencies and the Permittees are not “ill-equipped” to allocate funding to control MS4 discharges. And, as explained below, Claimants have been subject to the same federal standards (the requirement to effectively prohibit non-stormwater discharges into the MS4 and implement controls to reduce the discharge of pollutants in stormwater to the MEP, and other controls determined appropriate by the permitting agency) for decades. Whether Claimants must implement different approaches in an effort to achieve the required federal standards does not mean the state has imposed a new program or required performance of a higher level of service.

B. Mandates Exceptions Preclude Finding Subvention is Required

The following mandates exceptions apply to the contested provisions such that subvention is not required.

1. The Los Angeles Water Board Determined the Permit Provisions Were Required by Federal Law

¹¹⁵ See, Letter from U.S. EPA, Alexis Strauss, to State Water Board, April 10, 2008, concerning Los Angeles County Copermittee Test Claims Nos. 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (AR, pp. A003789-91), citing 55 Fed. Reg. 47990, 48052 (“EPA anticipates that storm water management programs will evolve and mature over time.”); 64 Fed. Reg. 68722, 68754; Dec. 8, 1999 (“EPA envisions application of the MEP standard as an iterative process.”); and Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits (Sept. 1, 1996) (“The interim permitting approach uses BMPs in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards.”).

¹¹⁶ See *City of San Jose v. State of California* (1996) 45 Cal. App.4th 1802, 1812 [citing *Lucia Mar Unified School Dist. v. Honig* (1988) 44 Cal.3d 830, 836]; see also *County of Sonoma v. Comm’n on State Mandates* (2000) 84 Cal. App.4th 1264, 1288 [state law requiring reallocation of school funds from one local government entity to another, where local government generally had always had a substantial role in funding schools, did not impose a higher level of service].

¹¹⁷ See *County of Los Angeles v. Comm’n on State Mandates*, *supra*, 110 Cal.App.4th at p. 1194; accord *Dept. of Finance v. Comm’n on State Mandates*, *supra*, 1 Cal.5th at p. 771 [agreeing that state had shifted responsibility for some industrial inspections to local government agency].

¹¹⁸ See *County of Los Angeles v. Comm’n on State Mandates*, *supra*, 110 Cal.App.4th at p. 1194.

¹¹⁹ *Ibid.*; accord *Department of Finance v. Comm’n on State Mandates* (2003) 30 Cal.4th 727, 748 [requirement that school districts allocate some of their grant funds in a particular way did not transform those costs into a reimbursable state mandate].

a) Under *Department of Finance*, the Los Angeles Water Board's federal law findings are entitled to deference

Federal law specifically requires that permits be issued to the local governments that operate MS4s and that permits effectively prohibit non-stormwater discharges to the MS4, include controls to reduce the discharge of pollutants in stormwater to the maximum extent practicable, and include other provisions the permitting agency determines appropriate for the control of such pollutants. If the Water Boards had not been authorized to issue the NPDES permit in lieu of U.S. EPA, the MS4 discharges would be prohibited unless U.S. EPA itself issued a similar permit directly to the local governments. Therefore, in issuing the permit provisions necessary to comply with federal law, the Los Angeles Water Board exercised its duty under federal law. As the Ninth Circuit Court of Appeals held in *Natural Resources Defense Council v. U.S. EPA*, "Congress did not mandate a minimum standards approach."¹²⁰ Rather, Congress mandated that the permitting entity, here the Los Angeles Water Board, determine appropriate provisions designed to control pollutants.¹²¹

The Court of Appeal in *Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region*, succinctly addressed the federal mandate on the regional water boards to prescribe requirements that meet the CWA standard:¹²²

In creating a permit system for dischargers from municipal storm sewers, Congress intended to implement actual programs. (*Natural Resources Defense Council, Inc. v. Costle* (D.C.Cir.1977) 568 F.2d 1369, 1375.) The Clean Water Act authorizes the imposition of permit conditions, including: "management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." (33 U.S.C. § 1342, subd. (p)(3)(B)(iii).) The Act authorizes states to issue permits with conditions necessary to carry out its provisions. (33 U.S.C. § 1342, subd. (a)(1).) The permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants. (*NRDC v. EPA* (9th Cir.1992) 966 F.2d 1292, 1308.) That is what the Regional Board has created in the 2002 permit.¹²³

As in *Rancho Cucamonga*, the 2010 Permit includes requirements to implement BMPs to meet the MEP standard for stormwater discharges. The CWA mandates that permits issued to MS4s shall require controls to reduce the discharge of pollutants to the MEP, including management practices, control techniques and system, design and engineering methods, and other provisions determined appropriate for the control of such pollutants. Similarly, the Los Angeles Water Board exercised its duty under federal law and adopted the Permit provisions requiring compliance with non-stormwater discharge prohibitions, which is an independent federal law mandate. The fact that the Los Angeles Water Board exercised its discretion, as required by federal law, to impose requirements that it determined were necessary to implement federal law and meet the CWA

¹²⁰ *NRDC v. U.S. EPA*, *supra*, 966 F.2d at 1308.

¹²¹ *Ibid.*

¹²² *City of Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region* (2002) 135 Cal.App.4th 1377.

¹²³ *Id.*, at 1389.

standards in the Permit supports the conclusion that the permit provisions are federal, not state mandates. Under the factual circumstances here, *Department of Finance* does not require a different result.

An essential underpinning of *Department of Finance* is the Supreme Court's determination that the 2001 LA County MS4 Permit had as its roots both federal and State law. The Los Angeles Water Board made no finding that the permit requirements were necessary to implement the MEP standard.¹²⁴ Instead, the Los Angeles Water Board found only that the permit was consistent with or within the federal standard.

In contrast, when issuing this Permit, the Los Angeles Water Board implemented *only federal law*. The Los Angeles Water Board found the following:

- “This Order implements federally mandated requirements under CWA § 402, subdivision (p)(3)(B) (33 U.S.C. § 1342(p)(3)(B)). This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.”¹²⁵
- “[I]t is entirely federal authority that forms the legal basis to establish the permit provisions.”¹²⁶
- “The Regional Board has prepared this Order so that implementation of provisions contained in this Order by Permittees will meet the requirements of the federal NPDES regulations at 40 CFR 122.26.”¹²⁷
- “The Board finds that all requirements in this order are practicable.”¹²⁸
- “This Order and the provisions herein are intended to develop, achieve, and implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water to the MEP and not cause or contribute to exceedances of water quality standards for the permitted areas in the County of Ventura.”¹²⁹

¹²⁴ *Department of Finance v. Comm'n on State Mandates*, *supra*, 1 Cal.5th at p. 768.

¹²⁵ 2010 Permit, Finding E.7 (AR, pp. F0001371).

¹²⁶ *Ibid.*

¹²⁷ 2010 Permit, Finding C.4 and Fact Sheet (AR, pp. F0001367-68, F003240).

¹²⁸ 2010 Permit, Finding E.27 (AR, p. F0001380).

¹²⁹ 2010 Permit, Provision 4.A.1 (AR, p. F0001396). In 1999, U.S. EPA required California to include receiving water limitations in MS4 permits. (State Water Board Order WQ 99-05 [*Petition of Environmental Health Coalition to Review Waste Discharge Requirements for Storm Water and Urban Runoff from the Orange County Flood Control District et al.*]; see also, State Water Board Order WQ 2015-0075 [*Waste Discharge Requirements For Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except those Discharges Originating from the City of Long Beach MS4*], pp. 9-16.) Receiving water limitations prohibit permittees from causing or contributing to an exceedance of a water quality standard in receiving waters.

Findings in Section E of the Permit and the Fact Sheet set forth the Board's regulatory basis for issuing the Permit. Collectively, these findings make it clear that the Board intended to and did rely solely on federal law in issuing the Permit.¹³⁰

The discussion herein describes how the contested provisions meet the MEP standard. In *Department of Finance*, the Supreme Court held that, "Had the Regional Board found when imposing the disputed permit conditions, that those conditions were the only means by which the maximum extent practicable standard could be implemented, deference to the board's expertise in reaching that finding would be appropriate."¹³¹ Unlike the 2001 LA County MS4 Permit, the Los Angeles Water Board made findings in connection with the specific challenged provisions in Part 4 of the Permit that such provisions were necessary to implement the MEP standard.¹³² The Los Angeles Water Board also found:

The authority exercised under this Order is not reserved state authority under the Clean Water Act's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not 'less stringent' than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, *it is entirely federal authority that forms the legal basis to establish the permit provisions.* (See, *City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)¹³³

As the Supreme Court held, "deference to the board's expertise in reaching that finding would be appropriate."¹³⁴

The Water Boards understand the Supreme Court to mean that, to be entitled to deference, the regional water boards must make an express finding that the particular set of permit conditions finally embodied in a given permit is required to meet that federal standard, and must support that finding with evidence. The opinion is consistent with the Boards' reading of the Clean Water Act: where a regional water board has devised a set of conditions necessary to ensure local governments' compliance with federal law (that is, a set of conditions that is federally mandated), the regional water board does not have a choice to impose some other, less rigorous, set of conditions.

¹³⁰ The finding that the permit terms are necessary to satisfy the federal MEP standard under the factual circumstances presented means the Los Angeles Water Board did not impose more stringent terms under the Porter-Cologne Water Quality Control Act, which it is authorized to do. (See *City of Burbank v. State Water Resources Control Board* (2005) 35 Cal.4th 613, 626-629.)

¹³¹ *Department of Finance v. Comm'n on State Mandates, supra*, 1 Cal.5th at p. 768.

¹³² See 2010 Permit, Provision 4.A.1 (AR, p. F0001396), stating: "This Order and the provisions herein are intended to develop, achieve, and implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water to the MEP and not cause or contribute to exceedances of water quality standards for the permitted areas in the County of Ventura."

¹³³ 2010 Permit, Finding E.7 (AR, pp. F0001371) (emphasis added).

¹³⁴ *Department of Finance v. Comm'n on State Mandates, supra*, 1 Cal.5th at p. 768.

As the legal standard is the “maximum extent practicable,” determining whether it has been exceeded necessarily rests on whether the Permit includes requirements which are impracticable. Practicability is a matter squarely within the Los Angeles Water Board’s jurisdiction and technical expertise. The Los Angeles Water Board found that “while commenters have alleged that the permit requirements are ‘beyond MEP,’ no commenter has presented evidence that demonstrates that any particular permit requirements is not actually practicable.”¹³⁵ In the Test Claim, Claimants continue to present no evidence that any of the contested provisions are impracticable. Accordingly, absent any evidence that any of the contested provisions are impracticable, the Commission cannot find these provisions subject to subvention. The Commission must defer to the board’s findings.¹³⁶

Additionally, the Permit, like its predecessors, implements the wholly separate Clean Water Act requirement that local agencies effectively prohibit non-stormwater discharges through their storm sewers. Specifically, the Clean Water Act provides that permits for discharges from MS4s “shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers.”¹³⁷ Permit provisions crafted to compel compliance with this federal mandate have been applicable since the first MS4 permit for Ventura County in 1994 and do not constitute imposition of a new program or require that Claimants perform a higher level of service.

Department of Finance addressed the narrow question of whether the federal MEP standard and certain implementing regulations¹³⁸ mandated both the trash can and inspection requirements contained in the 2001 LA County MS4 Permit. In reaching its decision, the Supreme Court’s analysis necessarily turned on whether, and to what extent, the MEP standard and the specific implementing regulations compelled the Los Angeles Water Board to impose the challenged permit conditions.¹³⁹ The non-stormwater discharge provisions are authorized by an independent federal requirement not analyzed by the Supreme Court in the *Department of Finance* decision. Consequently, the Supreme Court decision has limited application when the federal standard compelling a challenged permit provision is wholly separate from the MEP standard and those specific implementing regulations. One of the exceptions to the subvention requirements is if the mandate imposes a requirement that is mandated by a federal law or regulation and results in costs mandated by the federal government, unless the statute or executive order mandates costs that exceed the mandate in that federal law or regulation.¹⁴⁰

b) U.S. EPA Has Required Similar Provisions in Permits it Has Issued

The Supreme Court in *Department of Finance* observed that U.S. EPA-issued permits did not contain requirements to place trash receptacles at transit stops (a requirement of the 2001 LA County MS4 Permit), and found that the absence of such conditions in EPA-issued permits

¹³⁵ 2010 Permit, Finding E.27 (AR, p. F0001380).

¹³⁶ *Department of Finance*, *supra*, 1 Cal.5th at 768-769.

¹³⁷ CWA § 402(p)(3)(B)(ii).

¹³⁸ The Supreme Court considered Title 40 of the Code of Federal Regulations, parts 122.26(d)(2)(iv)(A)(3), (B)(1), (C)(1), and (D)(3) in reaching its decision. (*Department of Finance v. Comm’n on State Mandates*, *supra*, 1 Cal.5th at p. 749.)

¹³⁹ *Id.* at p. 767 (“The federal CWA broadly directed the board to issue permits...designed to reduce the pollutant discharges to the maximum extent practicable”).

¹⁴⁰ Gov. Code, § 17556, subd. (c).

“undermines the argument that the requirement was federally mandated.”¹⁴¹ The Court’s modifications to its original opinion underscore that determining what constitutes MEP is a case-specific, factual determination and the absence of similar conditions in U.S. EPA-issued permits is not fatal to the argument that a particular requirement is necessary to meet the federal standard.¹⁴² U.S. EPA has, however, issued permits requiring either equivalent or substantially similar provisions to the contested provisions of this Permit. If the State had not issued the Permit, the U.S. EPA would have done so. The inclusion of equivalent or substantially similar provisions by U.S. EPA in other permits demonstrates that the Los Angeles Water Board effectively administered federal requirements concerning permit requirements.

To the extent the provisions are more detailed or provide more specificity than past iterations of the Permit, this is consistent with U.S. EPA’s guidance that successive permits for the same MS4 must become more refined and detailed:

The EPA also expects stormwater permits to follow an iterative process whereby each successive permit becomes more refined, detailed, and expanded as needed, based on experience under the previous permit. See, 55 Fed. Reg. 47990, 48052 (“EPA anticipates that storm water management programs will evolve and mature over time.”); 64 Fed. Reg. 67722, 68754 (Dec. 8, 1999 (“EPA envisions application of the MEP as an iterative process.”) Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits (Sept. 1, 1996) (“The interim permitting approach uses BMPs in first-round stormwater permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards.”)¹⁴³

The permit provisions are, as the Los Angeles Water Board concluded, federal mandates. Even if the Commission concludes that some aspect of a challenged provision imposes requirements that exceed a federal mandate, the costs to implement those activities are *de minimis* and therefore not entitled to subvention.¹⁴⁴

c) The Claimants Had the “True Choice” to Seek Substitute BMPs, and Have Not Exhausted Their Administrative Remedies for Doing So

¹⁴¹ *Department of Finance v. Comm’n on State Mandates*, *supra*, 1 Cal.5th at p. 772.

¹⁴² The Court stated:

The opinion in this matter filed on August 29, 2016, and appearing in the California Official Reports at 1 Cal.5th 749, is modified as follows: On page 768 of the published opinion, a footnote is inserted at the end of the sentence that reads: “The board’s legal authority to administer the CWA and its technical experience in water quality control would call on sister agencies as well as courts to defer to that finding.” The new footnote, which is numbered as footnote 15, reads: “Of course, this finding would be case specific, based among other things on local factual circumstances.” On page 771 of the published opinion, current footnote 15 is renumbered as footnote 16. On page 772 of the published opinion, the word “fatally” is deleted from the sentence that reads: “The fact the EPA itself had issued permits in other cities, but did not include the trash receptacle condition, fatally undermines the argument that the requirement was federally mandate.”

¹⁴³ Letter from U.S. EPA, Alexis Strauss, to State Water Board, April 10, 2008, concerning Los Angeles County Copermittee Test Claims Nos. 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (AR, pp. A003789-91).

¹⁴⁴ See generally, *San Diego Unified School District v. Comm’n on State Mandates* (2004) 33 Cal.4th 859, 889.

While the Los Angeles Water Board found the BMPs in the Permit to be technically feasible, practicable, and cost-effective, the Board also provided the Permittees with the opportunity to substitute BMPs where an identified BMP in the Permit may be impracticable.¹⁴⁵ Part 4.A.2 of the Permit states:

Best Management Practice Substitution

(a) The Regional Water Board Executive Officer may approved any site-specific BMP substitution upon written request by a Permittee(s) and after public notice, if the Permittee can document that:

- (1) The proposed alternative BMP or program will meet or exceed the objective of the original BMP or program in the reduction of storm water pollutants.
- (2) The fiscal burden of the original BMP or program is greater than the proposed alternative and does not achieve a greater improvement in storm water quality.
- (3) The proposed alternative BMP or program will be implemented within a similar period of time.
- (4) BMP substitution will be in accordance with the public review provisions of the Order (Part 7.C.1 and Part 7.C.2)

The Los Angeles Water Board received no requests from the Claimants or other permittees to substitute any BMP or program in either the 2009 Permit or the 2010 Permit using this provision.¹⁴⁶ By choosing not to avail themselves of this process, Claimants failed to exhaust their administrative remedies.

2. The Permit Does Not Impose Requirements Unique to Local Agencies

None of the challenged provisions is subject to subvention because the Permit is not imposed uniquely upon local government. In order to obtain reimbursement, the Claimants must demonstrate either that: (1) the program must carry out a governmental function of providing services to the public, or (2) the requirements, to implement a state policy, implement unique requirements on local governments and do not apply generally to all residents.¹⁴⁷ “[T]he intent underlying section 6 was to require reimbursement to local agencies for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities.”¹⁴⁸

¹⁴⁵ See generally 2010 Permit, Findings F.14 to F.17 and Provision 4.A.2 (AR, pp. F0001384-86, F0001396).

¹⁴⁶ Some specific provisions of the Permit also provided Permittees with options for how to comply with the provision, including Part 4.C.2(c)(6) [regarding outreach to K-12 school children on stormwater pollution] (AR, p. F0001399) and Attachment F, Part F [regarding the Hydromodification Control Study] (AR, at pp. F0001509-10). Additionally, Permittees made requests, which the Los Angeles Water Board Executive Officer granted, regarding development of their own annual reporting form and locations of bioassessment monitoring sites per their Monitoring and Reporting Program. See Letter from Samuel Unger, Executive Officer, to Norma Camacho, Director, VCWPD, dated November 29, 2010, “Approval Of Revised Annual Reporting Format For Reporting Program No. CI 7388”; Los Angeles Water Board, “Response to Request to Confirm Level of Effort Prescribed in Order No. R4-2010-0108, Attachment F, Section 1.1.a.1.a.i, in Accordance With New Five Year Study Design for SMC Regional Bioassessment Program” (June 4, 2015).

¹⁴⁷ Cal. Const. Art. XIII B, § 6, subd. a; see also *City of Richmond v. Comm’n on State Mandates* (1998) 64 Cal.App.4th 1190, 1199.

¹⁴⁸ *City of Richmond v. Comm’n on State Mandates*, *supra*, 64 Cal.App.4th at p. 1197.

Laws of general applicability are not entitled to subvention because they do not “force” programs on localities.¹⁴⁹ The fact that a requirement may single out local governments is not dispositive; where local agencies are required to perform the same functions as private industry, no subvention is required.¹⁵⁰

U.S. EPA requires both municipal and non-municipal stormwater discharges to be controlled.¹⁵¹ Moreover, numerous provision of the Permit are “laws of general applicability” and therefore fail to constitute an unfunded state mandate.¹⁵² Compliance with NPDES regulations and permits, and specifically with stormwater permits, is required by private industry as well as state and federal government agencies.¹⁵³ Local government is not subject to “unique” requirements. In fact, MS4 discharges are not managed as stringently as industrial and construction stormwater discharges.¹⁵⁴ Thus, while the provisions in the 2010 Permit apply only to the public entities named in the Permit, the substantive actions required by the permit’s provisions are by no means unique to this class of permittee. That other NPDES permits impose similar requirements on non-local agencies demonstrates that the provisions in the Permit are not unique to local government.

3. Claimants Have Authority to Raise Fees for the Contested Provisions

Claimants must establish that they are required to use tax monies to pay for implementation of the contested provisions.¹⁵⁵ Subvention is not required if the costs can be reallocated or funded through service charges, fees, assessments, or other means.¹⁵⁶ Claimants have not demonstrated that they are precluded from establishing or raising fees or lack another revenue source to pay for implementation of the contested provisions.¹⁵⁷

¹⁴⁹ *Ibid.*; *County of Los Angeles v. State of California*, *supra*, 43 Cal.3d at pp. 56-57.

¹⁵⁰ *Ibid.*; *City of Richmond v. Comm’n on State Mandates*, *supra*, 64 Cal.App.4th at p. 1197.

¹⁵¹ 40 C.F.R. § 122.26(a)(vi)(6).

¹⁵² See *City of Richmond v. Comm’n on State Mandates*, *supra*, 64 Cal.App.4th at pp. 1197-1198.

¹⁵³ See e.g., State Water Resources Control Board, Order No. 2014-0057-DWQ, NPDES General Permit for Storm Water Discharges Associated with Industrial Activities; State Water Resources Control Board, Order 2012-0011-DWQ (as amended by Orders WQ 2014-0006-EXEC, WQ 2014-0077-DWQ, and WQ 2015-0036-EXEC), NPDES Statewide Storm Water Permit, Waste Discharge Requirements for State of California, Department of Transportation.

¹⁵⁴ *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1164-1165 [distinguishing “strict compliance” required of industrial storm water dischargers to MEP standard applicable to municipal stormwater dischargers.]

¹⁵⁵ Gov. Code, § 17553, subd. (b)(1)(F) [test claim must identify funding sources, including general purpose funds available for this purpose, special funds and fee authority]; *Id.* § 17556, subd. (d).

¹⁵⁶ See Gov. Code, § 17556, subd. (d) [costs not mandated by the state when the local agency has “authority to levy service charges, fees, or assessments sufficient to pay for the mandated program or increased level of service”]; *County of Los Angeles v. Comm’n on State Mandates*, *supra*, 110 Cal.App.4th at p. 1189 [“in order for a state mandate to be found, the local governmental entity must be required to expend the proceeds of its tax revenues”]; *Redevelopment Agency v. Comm’n on State Mandates* (1997) 55 Cal.App.4th 976, 987 [“No state duty of subvention is triggered where the local agency is not required to expend its proceeds of taxes”].

¹⁵⁷ Claimants must also demonstrate that the fees are more than *de minimis*. (*San Diego Unified School Dist. v. Commission on State Mandates*, *supra*, 33 Cal.4th at p. 889 [“incidental procedural requirements, producing at most *de minimis* added cost, should be viewed as part and parcel of the underlying federal mandate, and hence nonreimbursable under Government Code, section 17556, subdivision (c)”].) *Department of Finance* did not consider when a particular cost is *de minimis*. Except to the extent the Supreme Court affirmed prior holdings that *de minimis* costs do not create reimbursable mandates, *Department of Finance* does not apply to the Commission’s determination on that issue.

In the Commission's Statement of Decision concerning certain provisions of the 2001 LA County MS4 Permit that were considered in *Department of Finance*, the Commission found that all but one of the challenged provisions issued by the Los Angeles Water Board did not qualify as unfunded state mandates as they did "not impose costs mandated by the state within the meaning of Article XIII B, Section 6 of the California Constitution because the claimants have fee authority (under Cal. Const. article XI, § 7) within the meaning of Government Code section 17556, subdivision (d), sufficient to pay for the activities in those parts of the permit."¹⁵⁸ Although the Supreme Court acknowledged the Commission's finding, it did not address the fee issue but remanded for further proceedings. *Department of Finance* is thus inapplicable on this issue.

Claimants are not *required* to use taxes to pay for the costs of the programs, and can levy fees. Like the Department of Finance, the Water Boards believe that Claimants possess fee authority within the meaning of Government Code section 17566, subdivision (d), such that no reimbursement by the state is required. Such authority is undiminished by Propositions 218 or 26. Notably, Proposition 26 specifically excludes assessments and property-related fees imposed in accordance with Proposition 218 from the definition of taxes.¹⁵⁹

In 2005, the Legislature authorized the Ventura County Watershed Protection District to increase property related fees to fund storm drainage service and facilities within its jurisdiction.¹⁶⁰ The District has statutory authorization to levy an ad valorem tax or an assessment upon all taxable property in the district, or a fee imposed pursuant to Article XIII D of the California Constitution, to pay the costs and expenses of the district.¹⁶¹ The Claimants also have the ability to charge fees to cover development program costs.¹⁶² Claimants also have authority to impose property-related fees under their police power to pay for the costs of complying with the Permit, whether or not it is politically feasible to impose such fees via voter approval as may be required by Proposition 218.¹⁶³ Local governments can choose not to submit a fee to the voters or voters can reject a proposed fee. Claimants provide no evidence whatsoever that it attempted to raise fees, but was prevented from doing so. A municipality's failure even to attempt the process does not turn permit costs into state reimbursable mandates.¹⁶⁴

Municipalities can and do impose fees on their residents and businesses to fund aspects of their stormwater programs. For example, the cities of Culver City, Alameda, Palo Alto, San Clemente, San Jose, and Santa Cruz have all either adopted new fees for implementation of their programs,

¹⁵⁸ Statement of Decision on Test Claim Nos. 03-TC-04, 03-TC-19, 03-TC-20, 03-TC-21, p. 2.

¹⁵⁹ Art. XIIC, § 1, subd. (e)(7).

¹⁶⁰ Ventura County Watershed Protection Act, California Water Code Appendix, Chapter 46, § 12.

¹⁶¹ *Ibid.*

¹⁶² For a general overview of funding mechanisms that have been employed by municipalities, see Black and Veatch 2005 Stormwater Utility Survey, p. 2 (72% cited stormwater user fees as major [at least 90% of total income] revenue sources and the majority of utilities reported funding was adequate to meet all or most needs).

¹⁶³ Also relevant is that, earlier this month, the Governor signed Senate Bill 231 (Hertzberg), which amended the definition of "sewer" in Government Code section 53750 to specifically include stormwater and added a new section 53751 clarifying the Legislature's intent regarding the use of the term "sewer" and its relationship to Proposition 218. (Stats. 2017, ch. 536.) Senate Bill 231 takes effect January 1, 2018.

¹⁶⁴ *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 398 [where statute on its face authorized water districts to levy fees sufficient to pay the costs associated with a regulatory change, there was no right to reimbursement]; *Clovis Unified School Dist. v. Chiang* (2010) 188 Cal.App.4th 794, 812 ["to the extent a local agency... 'has the authority' to charge for the mandated program or increased level of service, that charge cannot be recovered as a state mandated cost"].

raised existing stormwater fees, or adopted fee assessments.¹⁶⁵ Whether circumstances make it impractical to assess fees is not relevant to the inquiry.

VI. SPECIFIC RESPONSES

While the general discussion above in Section V explains why it is appropriate for the Commission to reject the Test Claim in its entirety, the following elaboration on specific challenges provides additional justification in support of Test Claim rejection. While the Water Boards dispute Claimants' references to the 2000 Permit as the "prior permit," as explained in Section V.A.1 above, the Water Boards do compare some provisions to the 2000 Permit for purposes of the discussions below in order to fully respond to the allegations made in the Test Claim. For ease of reference, the specific responses below follow the organization format of the Test Claim.

A. Public Information/Participation Program (Parts 4.C.2(c)(1)(C); 4.C.2(c)(2); 4.C.2(c)(6); 4.C.2(c)(8); 4.C.2(d); 4.C.3(a); 4.C.3(b))

Parts 4.C.2(c)(1)(C), 4.C.2(c)(2), 4.C.2(c)(6), 4.C.2(c)(8), 4.C.2(d), 4.C.3(a), and 4.C.3(b) require Claimants to distribute stormwater pollution prevention materials to various retail points-of-purchase; develop a strategy to educate ethnic communities; provide materials to school children; develop and implement a behavioral change assessment strategy; develop pollutant-specific outreach programs; conduct corporate outreach; and implement a business assistance program. Claimants contend these requirements are not mandated by federal law, were not required as part of the 2000 Permit, and constitute new programs or higher levels of service.¹⁶⁶ These provisions are addressed in two subgroups, below.

The overall objectives of the Public Information and Participation Program (PIPP), as outlined in the 2010 Permit and supporting fact sheet, are as follows:

- (a) To increase the knowledge of the target audience about the MS4, the adverse impacts of storm water pollution on receiving waters and potential solutions to mitigate the impacts;
- (b) To change the waste disposal and storm water pollution generation behavior of target audiences by encouraging implementation of appropriate solutions;
- (c) To involve and engage communities in Ventura County to participate in mitigating the impacts of storm water pollution.¹⁶⁷

1. Residential Program – Outreach and Education

Part 4.C.2 of the 2010 Permit includes requirements for a Residential Program, including outreach and education components and pollutant-specific outreach components, to ensure that federal requirements are met. Claimants are challenging five specific provisions within the Residential Program.

¹⁶⁵ See documentation of City of Alameda Storm Water Fee Ordinance, City of Palo Alto Storm Drainage Fee Ordinance, and storm water fees authorized in Cities of Culver City, San Clemente, San Jose and Santa Cruz, included as attachments to this response.

¹⁶⁶ Test Claim, p. 12.

¹⁶⁷ 2010 Permit, Part 4.C.1 (AR, p. F0001397).

**a) Distribution of Stormwater Pollution Prevention Public Education Materials
(Part 4.C.2(c)(1)(C))**

Part 4.C.2(c)(1)(C) requires that the Permittees collaboratively distribute stormwater pollution prevention public education materials no later than one year after permit adoption to: (i) automotive parts stores; (ii) home improvement centers/ lumber yards/ hardware stores; and (iii) pet shops/ feed stores.¹⁶⁸

There is No New Program or Higher Level of Service

Part 4.C.2(c)(1)(C) of the 2010 Permit is a refinement of Parts 4.A.4 and 4.A.5 of the 2000 Permit and, therefore, is not a new program or higher level of service. The 2000 Permit required that each co-Permittee distribute outreach material to the general public and school children and further required that Permittees ensure that a minimum of 2.1 million impressions per year were made on the general public about stormwater quality via print, local TV access, local radio, or other appropriate media.¹⁶⁹ Permittees can achieve the minimum number of impressions in part through distribution of materials to the public at retail purchase points. Additionally, Permittees were already distributing outreach material to the general public at home improvement centers and pet shops and feed stores. For example, the 2004-05 Annual Report includes a discussion of a public outreach program in coordination with Home Depot in which Pollution Prevention Fact Sheets were placed in the paint aisles and garden center and included “tear sheets” that residents could take to remind them of pollution prevention actions to take.¹⁷⁰ It also discusses similar outreach programs for pet waste/pet stores and manure management/feed stores.¹⁷¹

The Provision is Necessary to Meet Federal Law

The PIPP is necessary to meet federal standards applicable to MS4 discharges. One of the required means of achieving these federal requirements is through a comprehensive stormwater management program.¹⁷² Federal regulations identify four broad sources of pollutants within a MS4 service area that must be addressed by MS4 dischargers: runoff from commercial and residential areas, stormwater runoff from industrial areas, runoff from construction sites, and non-stormwater discharges.¹⁷³ The Residential Program within the PIPP is critical to addressing the first and last of these sources, and is a required element of a Permittee’s stormwater management program.¹⁷⁴

¹⁶⁸ Note that the Claimants report costs beyond the deadline of the requirement. (See Test Claim, p. 18.)

¹⁶⁹ 2000 Permit, Parts 4.A.4 and 4.A.5 (AR, p. F004054).

¹⁷⁰ 2004-05 Annual Report (AR, p. E006564).

¹⁷¹ *Id.* (AR, p. E006568).

¹⁷² 40 C.F.R. § 122.26(d)(2)(iv).

¹⁷³ 55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).

¹⁷⁴ See, 40 C.F.R. § 122.26(d)(2)(iv), including, in particular, subsections (A) [regarding structural and source control measures to reduce pollutants from commercial and residential areas], (A)(6) [regarding reduction of pollutants associated with application of pesticides, herbicides and fertilizer], (B)(5) [regarding facilitate public reporting of illicit discharges or water quality impacts from MS4 discharges], and (B)(6) [regarding educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials].

The 2010 Permit Fact Sheet discusses the basis for the requirements and cites U.S. EPA fact sheets, which provide direction on the federal expectations for Public Information and Participation Programs in MS4 permits.¹⁷⁵ In summary, the PIPP provisions in the 2010 Permit are designed to meet these federal requirements by establishing provisions tailored to pollutants of concern for Ventura County and the target audiences associated with those pollutants of concern. Consistent with EPA guidance, the PIPP provisions ensure public education and outreach is done in a manner appropriate to the audience and targets points in their activities where they are most likely to engage in polluting behaviors and where they purchase materials that are likely to end up as pollution (e.g., motor oil, fertilizers).¹⁷⁶ This program is intended to increase public knowledge of stormwater pollution and change behaviors in an effective and cost efficient manner.

U.S. EPA's MS4 Permit Improvement Guide provides an example PIPP permit provision, which includes a requirement to target three residential issues for stormwater education/outreach messaging, and includes in the list of examples residential car washing and auto maintenance control measures, home and garden care activities, disposal of household hazardous waste (e.g., paints, cleaning products), and pet and other animal waste.¹⁷⁷ Part 4.C.2(c)(1)(C) identifies three residential issues based on pollutants of concern in Ventura County; these pollutants of concern include fecal indicator bacteria, nitrogen, pesticides, and organic compounds (e.g., PAHs in used automotive oil), among others.¹⁷⁸ This is consistent with the federal intent for a permittee(s) to tailor their stormwater management program, including public education efforts, based on an understanding of the pollutant sources in their MS4 service area. With regard to these specific distribution points for educational materials, the 1990 Federal Register notice states that, "... improper disposal of oil into storm drains is often associated with do-it-yourself automobile oil changes in residential areas, or improper application or over-use of herbicides and pesticides in residential areas ..."¹⁷⁹ To effectively reach the appropriate audiences, Part 4.C.2(c)(1)(C) correlates the types of outreach material previously specified in Part 4.A.4 of the 2000 Permit with key purchase points associated with these residential activities as follows: (i) proper vehicle maintenance techniques with automotive parts stores; (ii) proper disposal of litter and green waste, proper lawn care, and water conservation practices with home improvement centers/lumber yards/hardware stores; and (iii) proper disposal of pet waste with pet shops/feed stores.

Other Mandates Exceptions Apply

This refinement of distribution points for these outreach materials is consistent with the Permittees' January 2005 permit reapplication package in which they discussed their existing PIPP.¹⁸⁰ In particular, the reapplication package discusses partnerships that co-Permittees had already established with other organizations to "promote proper use of pesticides and herbicides

¹⁷⁵ 2010 Permit, Fact Sheet, Section V.C. (AR, pp. F003245-47).

¹⁷⁶ U.S. EPA, Developing an Outreach Strategy, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 3.

¹⁷⁷ 2010 MS4 Permit Improvement Guide, Chapter 2, p. 18-20 (AR, pp. F004460-62).

¹⁷⁸ 2010 Permit, Findings B.1 and B.2 (AR, pp. F0001357-58); 2010 Permit, Attachment B (AR, pp. F0001486-88).

¹⁷⁹ 55 Fed. Reg. 47990, 48052.

¹⁸⁰ Report of Waste Discharge: Ventura Countywide Stormwater Quality Management Program; Ventura County Watershed Protection District (January 2005) (AR, pp. A17840-913).

and source control Best Management Practices (BMPs).¹⁸¹ The reapplication package also states that co-Permittees' existing outreach material includes "BMP fact sheet and poster for horse owners and the equine industry."¹⁸² Finally, the reapplication package discusses in detail the Permittees' pet waste campaign in which flyers were distributed to "pet stores, veterinary offices, and at outreach events" and notes that this was a big success.¹⁸³ These latter two programs directly implement Part 4.C.2(c)(1)(C)(iii) of the 2010 Permit. Because Permittees had already been distributing educational materials at some types of retail purchase points, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

b) Strategy to Educate Ethnic Communities (Part 4.C.2(c)(2))

Part 4.C.2(c)(2) of the 2010 Permit requires the Principal Permittee to develop a strategy to educate ethnic communities through culturally effective methods.

There is No New Program or Higher Level of Service

Part 4.C.2(c)(2) of the 2010 Permit is not a new program and does not require a higher level of service because, as with Part 4.C.2(c)(1)(C), the Los Angeles Water Board included this provision largely based on the information provided by the Permittees on their current programs, which they included in their 2005 reapplication package and in their 2004-05, 2005-06, 2006-07, and 2007-08 Annual Reports. The Claimants note that their public education and outreach program involves and engages *different communities* throughout the County and aims to change the mind-set of a large, *diverse population*.¹⁸⁴ The Permittees also document several public awareness surveys that they or others had conducted during the terms of the 1994 and 2000 permits, and many examples where they were already providing outreach in other languages, namely Spanish.¹⁸⁵ As such, the requirement is just continuing what was already in place.

The Provision is Necessary to Meet Federal Law

As noted in the 2010 Permit Fact Sheet, implementation of a PIPP is a critical BMP and a necessary component of a stormwater management program under federal regulations. Federal regulations state that "[t]he permit should encourage the permittee to tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children."¹⁸⁶ This particular provision is included to ensure the Permittees' PIPP reaches population segments that

¹⁸¹ *Id.* (AR, p. A017850).

¹⁸² *Ibid.*

¹⁸³ *Id.* (AR, pp. A017851-52).

¹⁸⁴ *Id.* (AR, p. A017849).

¹⁸⁵ *Id.* (AR, pp. A017851-52) [regarding public information announcements on a Spanish language radio station and Pet Waste flyers published in Spanish]. See, also, Ventura Countywide Stormwater Quality Management Program, 2004-05 Annual Report (AR, pp. E006523-E006812), which notes a plan to translate all new countywide outreach materials into Spanish (AR, p. E006560); a schedule for drafts of all outreach materials in Spanish to be available by 2005-06 (AR, p. E006561); previous distribution of a Spanish version of the flyer "What's the Scoop?" for pet owners (AR, p. E006568); previous surveys in 1996 and 2004 conducted in Spanish (AR, pp. E006572, 75-76); and a radio script campaign, including one Spanish radio station (AR, p. E006578).

¹⁸⁶ 40 C.F.R. § 122.34(b)(1)(ii).

might otherwise be overlooked.¹⁸⁷ Further, it ensures that the public outreach required as part of Permittees' stormwater management programs is not ineffective due to language/cultural barriers.

As in federal regulations, U.S. EPA's Fact Sheet on the Public Education and Outreach Minimum Control Measure states, "the public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."¹⁸⁸ Accordingly, Part 1.D.5.g(ii)(f) of the 2014 U.S. EPA Middle Rio Grande MS4 Permit states that "[t]he permittee may tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children. The permittee *must make information available for non-English speaking residents, where appropriate*" (emphasis added).¹⁸⁹

The U.S. EPA Fact Sheet "Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children" finds that, "many residents of ethnically and culturally diverse communities don't speak English. English messages contained in public education outreach materials may not be effectively reaching a significant portion of some communities."¹⁹⁰ Furthermore, the U.S. EPA's Storm Water Menu of BMPs for the Minimum Measure: Public Education and Outreach on Stormwater Impacts states:

Basic census research on income and educational demographics might be supplemented by feedback from small focus groups of the target audience with whose help you can better understand them. Research can tell you where the audience needs help to overcome barriers that perpetuate polluting behaviors (for example, all pollution prevention messages are in English, but a large section of the audience speaks Spanish.) It is worth getting to know the target audiences specifically to develop outreach messages that both resonate with, and more importantly, reach them.¹⁹¹

The contested provision merely requires that public education messages must be available to and comprehensible by the entire population group. Given the population characteristics of Ventura County, which indicate that over 35% of the population speaks a language other than English at home, over 20% of the population is foreign-born, and approximately 40% of the population is Hispanic or Latino, this provision is federally required per the U.S. EPA guidance and U.S. EPA issued MS4 permits.¹⁹²

¹⁸⁷ 2010 Permit, Fact Sheet, Section V.C (AR, p. F003245-46).

¹⁸⁸ U.S. EPA, Stormwater Phase II Final Rule Fact Sheet: *Public Education and Outreach Minimum Control Measure* (Dec. 2005).

¹⁸⁹ U.S. EPA, NPDES Permit No. NMR04A000, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the Middle Rio Grande Watershed (Dec. 22, 2014), p. 44-45.

¹⁹⁰ U.S. EPA, Stormwater Outreach for Commercial Businesses Minimum Measure: Public Education and Outreach on Stormwater Impacts, Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children, p. 1.

¹⁹¹ U.S. EPA, Developing an Outreach Strategy, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 3.

¹⁹² U.S. Census Bureau, *Quick Facts, Ventura County, California*.

Other Mandates Exceptions Apply

Implementing a strategy to educate ethnic communities is consistent with the Permittees' January 2005 permit reapplication package and their 2005-06 Annual Report in which they discussed their existing PIPP.¹⁹³ In particular, the reapplication package and 2005-06 Annual Report discuss multiple surveys that the Permittees and others have conducted to improve their PIPP and provide examples of how the Permittees were already providing outreach in other languages, namely Spanish.¹⁹⁴ The 2006-07 and 2007-08 Annual Reports have dedicated discussions on bilingual outreach. In the 2006-07 Annual Report, the Permittees state, "[w]ith an eye toward reaching all Ventura County residents, every campaign includes Spanish language materials ... Targeting segments of the Hispanic community, clearly identified in earlier focus group research, as speaking only, or primarily Spanish, is a key component of each campaign period."¹⁹⁵ The 2007-08 Annual Report documents that 24% of the Countywide outreach efforts were in Spanish.¹⁹⁶ Because Permittees had already ensured that all outreach materials and public service announcements were effectively reaching the Hispanic community by making them all available in Spanish, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

c) Provide Educational Materials to Students (Part 4.C.2(c)(6))

Part 4.C.2(c)(6) of the 2010 Permit requires the Principal Permittee, in cooperation with the Permittees, to provide schools within each School District in the County with various materials to educate a minimum of 50 percent of all school children (K-12) every two years on stormwater pollution.

There is No New Program or Higher Level of Service

Part 4.C.2(c)(6) of the 2010 Permit is a refinement of Parts 4.A.4 and 4.A.5 of the 2000 Permit, which required Permittees to distribute outreach materials to school children and to make 2.1 impressions on the general public through its PIPP. The Los Angeles Water Board included this provision largely based on the information provided by the Permittees on their current programs, which they included in their 2005 reapplication package and in their 2005-06 and 2006-07 Annual Reports. For example, the Permittees note that their public education and outreach methods for students include classroom presentations, videos, and workbook materials, among other methods.¹⁹⁷ The permit provision reflects these existing methods developed and used by the Permittees, by requiring that the materials include "videos, live presentations, and other information." These programs align with the requirements of Part 4.C.2(c)(6) of the 2010 Permit.

¹⁹³ Report of Waste Discharge: Ventura Countywide Stormwater Quality Management Program; Ventura County Watershed Protection District (January 2005) (AR, pp. A17840-913); Ventura Countywide Stormwater Quality Management Program, 2005-06 Annual Report (AR, pp. E006813-94).

¹⁹⁴ *Id.* (AR, pp. A017852 and E006838-44).

¹⁹⁵ Ventura Countywide Stormwater Quality Management Program, 2006-07 Annual Report (AR, p. E006923).

¹⁹⁶ 2007-08 Annual Report (AR, p. E007016).

¹⁹⁷ Ventura Countywide Stormwater Quality Management Program, Report of Waste Discharge (January 2005), Table 2 (AR, p. A017850).

The Permittees also document the significant number of contacts with school-aged children achieved in the years preceding the 2010 Permit and describe three established programs targeting different student age groups: TidePool Cruiser for elementary school students; a radio scripts contest for middle school students; and the Ventura County Science Fair for 5th through 12th grade students.¹⁹⁸ As such, the requirement is just continuing what was already in place.

The Provision is Necessary to Meet Federal Law

Federal regulations state that MS4 permits should require permittees to tailor the public education program to specific audiences and lists implementing educational programs targeted at school age children.¹⁹⁹ The U.S. EPA's Storm Water Menu of BMPs for the Minimum Control Measure: Public Education and Outreach on Stormwater Impacts states, "[c]lassroom education plays an integral role in any stormwater pollution outreach program. Providing stormwater education through schools conveys the message not only to students but to their parents. Many municipal stormwater programs partner with educators and experts to develop storm water-related programs for the classroom. These lessons need not be elaborate or expensive to be effective."²⁰⁰ Furthermore, a similar provision was included in the EPA-issued Middle Rio Grande MS4 permit, which states, "[u]se tailored public education program, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children..."²⁰¹

To be consistent with U.S. EPA guidance that schools can be one of the most effective mediums to target school-aged children in comparison to public counters and events, Part 4.C.2(c)(6) of the 2010 Permit continued and refined the requirement in the 2000 Permit to target school-aged children in schools.

To meet the federal standards applicable to MS4 discharges, Part 4.C.2(c)(6) of the 2010 Permit promotes public awareness about storm water pollution prevention on a long-term basis by encouraging behavior changes as school-aged residents mature. Given the population characteristics of Ventura County where 25.7% of the population are children under 18 years old, this provision is necessary per the U.S. EPA guidance and U.S. EPA issued MS4 permits.²⁰²

Other Mandates Exceptions Apply

First, providing schools within each School District in the County with various materials to educate a minimum of 50 percent of all school children (K-12) every two years on stormwater pollution is

¹⁹⁸ 2006-07 Annual Report, Figure 3-3 (AR, p. E006928); Ventura Countywide Stormwater Quality Management Program, Report of Waste Discharge (January 2005) (AR, p. A017850-52) [regarding outreach methods for students and three specific school programs, the TidePool Cruiser, Radio Scripts Contest and Ventura County Science Fair].

¹⁹⁹ 40 C.F.R. § 122.34(b)(1)(ii).

²⁰⁰ U.S. EPA, Classroom Education on Stormwater, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 1.

²⁰¹ U.S. EPA, NPDES Permit No. NMR04A000, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the Middle Rio Grande Watershed (Dec. 22, 2014), Part 1.D.5.g(ii)(e), p. 45.

²⁰² See U.S. Census Bureau, *Quick Facts, Ventura County, California*.

consistent with the Permittees' established school outreach programs as described in their January 2005 permit reapplication package and various Annual Reports in which they discussed their existing PIPP.²⁰³ In particular, the reapplication package and 2006-07 Annual Report discuss the importance of the school outreach program, the range of outreach methods being used, several established programs targeting school children, and the significant number of contacts made with school-aged children through these programs.²⁰⁴ Because Permittees had already developed videos, presentations, other materials, and various programs for students, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

Second, in the case of Part 4.C.2(c)(6), Permittees were provided with the flexibility to choose from two other options to comply with this provision. These options were: 1) to submit a plan to the Los Angeles Water Board Executive Officer for consideration no later than to provide outreach in lieu of the school curriculum, or 2) to provide an equivalent amount of funds to the Environmental Education Account established within the State Treasury.²⁰⁵ Permittees elected to develop a plan.²⁰⁶

d) Behavioral Change Assessment (Part 4.C.2(c)(8))

Part 4.C.2(c)(8) of the 2010 Permit requires the Permittees to develop and implement a behavioral change assessment strategy in order to determine whether the PIPP is demonstrably effective in changing the behavior of the public.

There is No New Program or Higher Level of Service

Part 4.C.2(c)(8) of the 2010 Permit is not a new program or higher level of service because Permittees had already been routinely conducting surveys to measure changes in public behavior as a result of their outreach efforts. In both the 2004-05 and 2006-07 Annual Reports, Permittees describe several surveys implemented by themselves and others to assess behavioral changes as a result of the Permittees' PIPP. As such, the requirement to develop and implement a behavioral assessment strategy was already being carried out by the Permittees and had been for a number of years.²⁰⁷

The Provision is Necessary to Meet Federal Law

The requirement to implement a behavioral change assessment strategy was included to address federal requirements and U.S. EPA guidance on how to meet those requirements. With regards to assessing the effectiveness of a Permittee's stormwater management program, such an assessment is specifically required of MS4 permittees by federal regulations at 40 C.F.R. sections

²⁰³ Report of Waste Discharge: Ventura Countywide Stormwater Quality Management Program; Ventura County Watershed Protection District (January 2005) (AR, pp. A17840-913).

²⁰⁴ Ventura Countywide Stormwater Quality Management Program, Report of Waste Discharge (January 2005) (AR, p. A017850-52) [regarding outreach methods for students and three specific school programs, the TidePool Cruiser, Radio Scripts Contest and Ventura County Science Fair]; 2006-07 Annual Report, Figure 3-3 (AR, p. E006928).

²⁰⁵ 2010 Permit, Part 4.C.2(c)(6) (AR, p. F0001399).

²⁰⁶ 2011-2012 Annual Report, p. 3-24.

²⁰⁷ 2004-05 Annual Report, Section 3.5 (AR, pp. E006572-76); 2006-07 Annual Report, Section 3.2.4 (AR, pp. E006924-25).

122.26(d)(2)(v) and 122.42(c)(3). Section 122.26(d)(2)(v) requires an assessment of controls [BMPs] proposed to be implemented as a result of the Permittees' stormwater quality management programs, while section 122.42(c)(3) requires that Permittees revise the assessment of their stormwater quality management program as necessary in each annual report based on actual program implementation outcomes (e.g., changes in public behavior).²⁰⁸

U.S. EPA's Storm Water Menu of BMPs for the Minimum Control Measure: Public Education and Outreach on Stormwater Impacts states, "All successful programs incorporate methods of evaluation, to help them see what works and what does not. ... Evaluation will also help justify future funding or if the scope of the activity or product must be expanded or scaled down."²⁰⁹ In Chapter 2 of the MS4 Permit Improvement Guide, U.S. EPA states:

[f]inally, the underlying principle of any public education and outreach effort is to change behaviors. The permittee must develop a process to assess how well its public education and outreach programs is changing public awareness and behaviors and to determine what changes are necessary to make its public education program more effective. This assessment of public education programs is typically conducted via phone surveys, but other assessment methods that quantify results can be used. The permittee is encouraged to use a variety of assessment methods to evaluate the effectiveness of different public education activities.²¹⁰

Based on this, the following provision is recommended: "Within [insert deadline, e.g., within the permit term], the permittee must assess changes in public awareness and behavior resulting from the implementation of the program such as using a statistically valid survey and modify the education/outreach program accordingly."²¹¹

Additionally, U.S. EPA-issued MS4 permits include similar provisions. The MS4 permit for the District of Columbia states, "[t]he permittee shall assess current education and outreach efforts and identify areas where additional outreach and education are needed. Audiences and subject areas to be considered include:..."²¹² Part 4.9.2 states "The permittee shall continue to measure the understanding and adoption of selected targeted behaviors among the targeted audiences. The resulting measurements shall be used to direct education and outreach resources most effectively, as well as to evaluate changes in the adoption of the targeted behaviors."²¹³ Additionally, a similar provision is in the U.S. EPA-issued MS4 permit for the Boise/Garden City Area, which states, "[t]he Permittees must assess, or participate in an effort to assess understanding and adoption of behaviors by the target audiences. The resulting assessments

²⁰⁸ Note, also, that 40 C.F.R. § 122.34(d)(1) dictates that permits "must require the permittee to evaluate compliance with the terms and conditions of the permit, including the effectiveness of the components of its storm water management program, and the status of achieving the measurable requirements in the permit."

²⁰⁹ U.S. EPA, Developing an Outreach Strategy, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 3.

²¹⁰ U.S. EPA, MS4 Permit Improvement Guide (AR, p. F004462).

²¹¹ *Id.* (AR, p. F004461).

²¹² U.S. EPA, NPDES Permit No. DC0000221, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the District of Columbia (Oct. 7, 2011), Part 4.9.1.2, pp. 27-28.

²¹³ *Ibid.*

must be used to direct storm water education and outreach resources most effectively.”²¹⁴ Finally, Part 2.3.2 of the U.S. EPA-issued MS4 general permit for Massachusetts requires that permittees “identify methods that it will use to evaluate the effectiveness of the educational messages” and that “any methods ... shall be tied to ... the overall objective of changes in behavior and knowledge.”²¹⁵

As indicated above, Part 4.C.2(c)(8) of the 2010 Permit is necessary to meet federal standards for assessing and reporting on program effectiveness and ensuring that the federal standards for controlling pollutant discharges from MS4s are met.

Other Mandates Exceptions Apply

Developing and implementing a behavioral change assessment strategy is consistent with the Permittees’ established program to conduct surveys of the general public’s knowledge and behaviors and use the results to assess behavior changes resulting from implementation of the Permittees’ PIPP. They describe this program in their January 2005 permit reapplication package and various Annual Reports.²¹⁶ In particular, the Permittees state in their 2004-05 Annual Report that they determined that the development of an approach and methodology for future Ventura County public awareness surveys was paramount to ensure that the program’s public awareness surveys are effective and able to measure changes in knowledge and behavior. They went on to state that the Co-permittees “will develop a new survey to be implemented in the next permit term (expected to begin July 2005). This Public Awareness Survey will serve as a baseline in which changes in public knowledge, behaviors and public opinion will be measured.”²¹⁷ Additionally, because Permittees had already developed behavioral change surveys and partnered with other entities to administer some of the surveys, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

e) Pollutant-Specific Outreach (Part 4.C.2(d))

Part 4.C.2(d) of the 2010 Permit requires the Principal Permittee, in cooperation with the Permittees, to develop outreach programs that focus on metals, urban pesticides, bacteria and nutrients as the pollutants of concern. The provision notes that metals may be appropriately addressed separately through the Industrial/Commercial Facilities Program and that region-wide pollutants may be included in the Principal Permittee's mass media outreach program.

²¹⁴ U.S. EPA, NPDES Permit No. IDS-027561, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to Ada County Highway District, Boise State University, City of Boise, and City of Garden City. Drainage District #3, and the Idaho Transportation Department District #3 (Dec. 12, 2012), Part II.B.6.b(ii), pp. 31-32.

²¹⁵ U.S. EPA, General Permits For Stormwater Discharges From Small Municipal Separate Storm Sewer Systems (MS4s) In Massachusetts, *Authorization to Discharge Under the National Pollutant Discharge Elimination System*, issued to MS4s located in the Commonwealth of Massachusetts, NPDES Permits No. MAR 041000, MAR042000, and MAR043000 (Apr. 4, 2016), p. 29.

²¹⁶ Report of Waste Discharge: Ventura Countywide Stormwater Quality Management Program; Ventura County Watershed Protection District (January 2005) (AR, pp. A17840-913).

²¹⁷ 2004-05 Annual Report, Section 3.5.5 (AR, p. E006576).

There is No New Program or Higher Level of Service

Part 4.C.2(d) of the 2010 Permit is not a new program or higher level of service because Permittees had already been conducting pollutant specific outreach as described in some of their Annual Reports. The 2004-05 Annual Report describes pollutant specific outreach regarding pet waste and manure management for horse owners and boarding/stable facilities, while the 2006-07 and 2007-08 Annual Reports describe an expansion in the public education efforts in fall 2006 to focus on additional pollutants of concern, including residential fertilizers, pesticides, and trash.²¹⁸ These programs address the pollutants of concern - - bacteria, nutrients, and urban pesticides - - identified in Part 4.C.2(d). As such, the requirement to conduct pollutant specific outreach was already being carried out by the Permittees and had been for a number of years while Permittees were covered by the 2000 Permit and prior to the issuance of the 2010 Permit.

The Provisions are Necessary to Meet Federal Law

This provision for pollutant-specific public outreach and education was included pursuant to 40 C.F.R. section 122.26(d)(2)(iv,) including, in particular, subsections (A)(6) and (B)(6) which require educational outreach for pollutants in discharges of pesticides/herbicides, fertilizers, oil, and toxic materials. Pollutants of concern in Ventura County include pesticides, nitrogen (found in fertilizers), fecal indicator bacteria, and organic compounds (e.g., PAHs in used automotive oil), among others.²¹⁹

In Chapter 2 of MS4 Permit Improvement Guide, U.S. EPA states:

[t]he public education and outreach program must be tailored and targeted to specific water quality issues of concern in the relevant community...EPA recommends that the permit writer consider requiring permittees to identify and describe issues, such as specific pollutants, the sources of those pollutants, impacts on biology, and the physical attributes of stormwater runoff, in their education/outreach program, which affect local watershed(s)...For Phase I, individual permits, it may be appropriate for the permit writer to specify the priority issues based on known issues, monitoring data, historical trends, etc.²²⁰

Additionally, U.S. EPA's Storm Water Menu of BMPs for the Minimum Control Measure: Public Education and Outreach on Stormwater Impacts states:

[m]ultiple goals are common for an outreach strategy. You should match outreach goals with the goals of the overall stormwater program and its environmental and water protection concerns. With specific goals that dovetail with the environmental goals for the affected waterbodies, you can more efficiently spend dollars to reduce the pollution issue. If reducing nutrients in local waterbodies is a concern, outreach goals should address nutrients generated by the public. For example, you could target the public's gardening practices. An example of an outreach goal might be:

²¹⁸ 2004-05 Annual Report, Section 3.4.4 "Pollutant Specific Public Education," (AR, p. E006568); 2006-07 Annual Report, Section 3.2.2 (AR, p. E006921); 2007-08 Annual Report, Section 3.2.1 (AR, p. E007015).

²¹⁹ 2010 Permit, Findings B.1 and B.2 and Attachment B (AR, pp. F0001357-58, F0001486-88).

²²⁰ U.S. EPA MS4 Permit Improvement Guide (AR, pp. F004462-63).

“Increase residential awareness of nutrient runoff and encourage behaviors that will reduce nutrient pollution in local streams and lakes.”²²¹

U.S. EPA-issued MS4 permits such as the one for Massachusetts include requirements to implement an education program that is based on stormwater issues of significance within the MS4 area.²²²

Part 4.C.2(d) of the 2010 Permit is, therefore, consistent with the federal requirement for MS4 Permittees to shape their stormwater management program, including public education efforts, based on an understanding of the pollutant sources in their MS4 service area. To meet the federal requirements, Part 4.C.2(d) of the 2010 Permit intends to match public outreach goals with overall stormwater program goals and targeted pollutants of concern in Ventura County.

Other Mandates Exceptions Apply

First, development pollutant-specific outreach programs is consistent with the Permittees' established program as described in their 2004-05, 2006-07 and 2007-08 Annual Reports, noted above. Additionally, because Permittees had already developed pollutant-specific materials, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

Second, according to a March 18, 2008 email transmittal of Permittees' suggested language changes based on the August 28, 2007 draft permit, the Permittees did not object to, or suggest significant changes to the proposed language.²²³

2. Business Program

a) Corporate Outreach (Part 4.C.3(a)(1))

Part 4.C.3(a)(1) of the 2010 Permit requires that the Permittees work with other regional or statewide agencies and, associations such as the California Storm Water Quality Association (CASQA), to develop and implement a Corporate Outreach program to educate and inform corporate franchise operators and/or local facility managers about storm water regulations and BMPs. The program must target certain numbers of Retail Gasoline Outlet (RGO) franchisers, retail automotive parts franchisers, home improvement center franchisers and restaurant franchisers. Outreach is to occur at least twice during the permit term. At a minimum, Permittees are required to confer with franchise operators and/or local facility managers to explain storm water regulations and distribute and discuss educational material regarding stormwater pollution and BMPs, and provide managers with recommendations to facilitate employee and facility compliance with storm water regulations.

²²¹ U.S. EPA, Developing an Outreach Strategy, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 2.

²²² U.S. EPA, General Permits For Stormwater Discharges From Small Municipal Separate Storm Sewer Systems (MS4s) In Massachusetts, *Authorization to Discharge Under the National Pollutant Discharge Elimination System*, issued to MS4s located in the Commonwealth of Massachusetts, NPDES Permits No. MAR 041000, MAR042000, and MAR043000 (Apr. 4, 2016), Part 2.3.2, pp. 27-28.

²²³ "Permittees Suggested Language Changes Based on 08/28/07 Draft Permit" (AR, pp. C00113, C001135).

There is No New Program or Higher Level of Service

Part 4.C.3(a)(1) of the 2010 Permit is not a new requirement or a higher level of service. This program is a refinement of the Programs for Industrial/Commercial Businesses in the 2000 Permit, Part 4.B, and in particular, subparts 1, 2, and 4. These provisions required Permittees to implement an industrial/commercial educational site inspection program (subpart 1) and, further, to inspect automotive service facilities and food service facilities (i.e., restaurants) (subpart 2). During site visits, Permittees were required to consult with a facility representative to explain applicable stormwater regulations and distribute and discuss applicable BMP and educational materials. Finally, the 2000 Permit, in Part 4.B.4, states that based on pollutants of concern source identification, additional target businesses may be identified to be included in the program.²²⁴

Permittees reported on their educational outreach to businesses in their Annual Reports. Permittees were conducting these activities prior to the 2010 Permit. For example, they reported outreach to automotive service facilities and food service facilities.²²⁵ They also reported developing a series of Clean Business Fact Sheets.²²⁶ Additionally, CASQA had developed a series of Business Category Storm Water Pollution Control Guide Sheets in January 2003 as part of its California Stormwater BMP Handbook. These included sheets for automotive services and food services among many others.²²⁷

The Provision is Necessary to Meet Federal Law

This provision for corporate outreach is necessary to meet federal standards and federal requirements regarding stormwater management programs at 40 C.F.R. section 122.26(d)(2)(iv), including subsections (A)(6) and (B)(6), which require educational outreach regarding pollutants in discharges of pesticides, herbicides, fertilizers, oil, and toxic materials.²²⁸ Federal regulations also direct targeted outreach to commercial, industrial, and institutional entities likely to have significant stormwater impacts, using restaurants as an example.²²⁹

Additionally, U.S. EPA's Storm Water Menu of BMPs for the Minimum Control Measure: Public Education and Outreach on Stormwater Impacts, Stormwater Outreach for Commercial Businesses states:

[a] successful outreach campaign must tailor its message to a targeted audience. The target audience may be industry or business groups whose activities influence the health of watersheds. Many commercial activities contribute to stormwater pollution (such as vehicle washing, landscape fertilization, and improper hazardous waste disposal). Therefore, it is important to address commercial

²²⁴ 2000 Permit, Parts 4.B.1, 4.B.2, and 4.B.4 (AR, pp. F004054-55).

²²⁵ 2004-05 Annual Report (AR, pp. E006587-88); 2005-06 Annual Report (AR, pp. E006846, E006848).

²²⁶ *Id.* (AR, pp. E006567, E006591). These are in addition to other fact sheets that the Permittees previously developed such as one for Mobile Detailers in 1999. (See Pollution Fact Sheet/Business – Vehicle/1999, “Mobile Detailers”).

²²⁷ CASQA, California Stormwater BMP Handbook (Jan. 2003), Appendix D, Business Category Storm Water Pollution Control Guide Sheets (AR, pp. A002355-435).

²²⁸ 40 C.F.R. § 122.26(d)(2)(iv).

²²⁹ *Id.*, § 122.34(b)(1)(ii).

activities specifically in an outreach strategy and recognize that in most cases incentives must be provided to encourage businesses to change their behavior.²³⁰

Pollutants of concern in Ventura County include fecal indicator bacteria, nitrogen, pesticides, and organic compounds (e.g., PAHs in used automotive oil), among others.²³¹ RGOs, automotive parts stores, home improvement centers, and restaurants are sources of pollutants of concern.²³² Part 4.C.3(a)(1) of the 2010 Permit is, therefore, necessary to meet the federal standards regarding control of pollutants in MS4 discharges and the requirement for Permittees to shape their stormwater management program, including outreach and education efforts, based on an understanding of the pollutant sources in their MS4 service area.

To meet the federal standards and requirements applicable to MS4 discharges, Part 4.C.3(a)(1) of the 2010 Permit addresses businesses that have the potential to contribute pollutants to stormwater on a corporate level. Rather than target individual facilities, this provision focuses on changing corporate awareness about potential pollutant generating activities to positively influence company policies to prevent/reduce pollutants in stormwater on a large scale in a cost effective manner.

Other Mandates Exceptions Apply

Since Permittees and CASQA had already developed Clean Business Fact Sheets and BMP Guide Sheets and had been targeting various businesses based on pollutants of concern, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

b) Business Assistance Program (Part 4.C.3(b)(1))

Part 4.C.3(b)(1) of the 2010 Permit requires that the Permittees implement a Business Assistance Program to provide technical information to small businesses to facilitate their efforts to reduce the discharge of pollutants in stormwater. The program involves on-site, telephone or e-mail consultation regarding the responsibilities of businesses to reduce the discharge of pollutants, procedural requirements, and available guidance documents, and distribution of stormwater pollution prevention education materials to operators of auto repair shops, car wash facilities (including mobile car detailing), mobile carpet cleaning services, commercial pesticide applicator services, and restaurants.

There is No New Program or Higher Level of Service

Part 4.C.3(b)(1) of the 2010 Permit is not a new requirement or a higher level of service. This program is a refinement of the Programs for Industrial/Commercial Businesses in the 1990 Permit, Part 4.B, and in particular, subparts 1, 2, and 4. These provisions required Permittees to implement an industrial/commercial educational site inspection program (subpart 1) and, further,

²³⁰ U.S. EPA, Stormwater Outreach for Commercial Businesses, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 1.

²³¹ 2010 Permit, Findings B.1 and B.2 and Attachment B (AR, pp. F0001357-58, F0001486-88).

²³² *Id.*, Findings B.13-B.14 (AR, p. F0001360). See Los Angeles Regional Water Board and San Diego Regional Water Board, Retail Gasoline Outlets: New Development Design Standards For Mitigation Of Storm Water Impacts, Technical Report (June 2001).

to inspect automotive service facilities and food service facilities (i.e., restaurants) (subpart 2). During site visits, Permittees were required to consult with a facility representative to explain applicable stormwater regulations and distribute and discussion applicable BMP and educational materials. Finally, the 2000 Permit, in Part 4.B.4, states that based on pollutants of concern source identification, additional target businesses may be identified to be included in the program.²³³

As required by Part 4.B.4, Permittees reported on their activities to target additional businesses in their Annual Reports. Permittees were conducting these activities prior to the 2010 Permit. For example, they reported targeting car washes, mobile businesses, commercial equestrian facilities, and agriculture-related facilities as well as automotive service facilities and food service facilities.²³⁴ They also reported developing a series of Clean Business Fact Sheets.²³⁵ These activities meet the requirements of the 2010 Permit.

The Provision is Necessary to Meet Federal Law

This provision for business assistance and outreach is necessary to meet federal standards and federal requirements regarding stormwater management programs at 40 C.F.R. section 122.26(d)(2)(iv), including subsections (A)(6) and (B)(6), which require educational outreach regarding pollutants in discharges of pesticides, herbicides, fertilizers, oil, and toxic materials.²³⁶ Federal regulations also direct targeted outreach to commercial, industrial, and institutional entities likely to have significant stormwater impacts, using restaurants as an example.²³⁷

Additionally, U.S. EPA's Storm Water Menu of BMPs for the Minimum Control Measure: Public Education and Outreach on Stormwater Impacts, Stormwater Outreach for Commercial Businesses states:

[a] successful outreach campaign must tailor its message to a targeted audience. The target audience may be industry or business groups whose activities influence the health of watersheds. Many commercial activities contribute to stormwater pollution (such as vehicle washing, landscape fertilization, and improper hazardous waste disposal). Therefore, it is important to address commercial activities specifically in an outreach strategy and recognize that in most cases incentives must be provided to encourage businesses to change their behavior.²³⁸

Pollutants of concern in Ventura County include fecal indicator bacteria, nitrogen, pesticides, and organic compounds (e.g., PAHs in used automotive oil), among others.²³⁹ Auto repair shops, car wash facilities (including mobile car detailing), mobile carpet cleaning services, commercial pesticide applicator services and restaurants are sources of pollutants of concern. Part 4.C.3(b)(1)

²³³ 2000 Permit, Parts 4.B.1, 4.B.2, and 4.B.4 (AR, pp. F004054-55).

²³⁴ 2004-05 Annual Report (AR, pp. E006587-88); 2005-06 Annual Report (AR, pp. E006846, E006848).

²³⁵ *Id.* (AR, pp. E006567, E006591). These are in addition to other fact sheets that the Permittees previously developed such as one for Mobile Detailers in 1999. (See Pollution Fact Sheet/Business – Vehicle/1999, "Mobile Detailers.")

²³⁶ 40 C.F.R. § 122.26(d)(2)(iv). Note that subpart (A)(6) specifically mentions educational activities and other measures for commercial applicators and distributors [of pesticides, herbicides, and fertilizer].

²³⁷ *Id.*, § 122.34(b)(1)(ii).

²³⁸ U.S. EPA, Stormwater Outreach for Commercial Businesses, Minimum Measure: Public Education and Outreach on Stormwater Impacts, p. 1.

²³⁹ 2010 Permit, Findings B.1 and B.2 and Attachment B (AR, pp. F0001357-58, F0001486-88).

of the 2010 Permit is, therefore, necessary to meet the federal standards regarding control of pollutants in MS4 discharges and the requirement for Permittees to shape their stormwater management program, including outreach and education efforts, based on an understanding of the pollutant sources in their MS4 service area.

Other Mandates Exceptions Apply

Since Permittees had already developed Clean Business Fact Sheet and had been targeting various businesses based on pollutants of concern, the majority of costs were incurred prior to issuance of the 2010 Permit. The Water Boards believe that any additional costs to meet the minimum requirement of the provision are *de minimus*.

For all these reasons, and for the additional reasons discussed in Section V above, the Commission should find that Parts 4.C.2(c)(1)(C); 4.C.2(c)(2); 4.C.2(c)(6); 4.C.2(c)(8); 4.C.2(d); 4.C.3(a); 4.C.3(b)) are not state mandates subject to subvention.

B. Reporting Program and Program Effectiveness Evaluation (Parts 3.E.1(e) and 4.I.1)

Parts 3.E.1(e) and 4.I.1 of the 2010 Permit require the District to evaluate, assess, and synthesize the results of the monitoring program and the effectiveness of the implementation of BMPs and to develop an Electronic Reporting Program, consisting of an electronic reporting form.²⁴⁰ Claimants allege these requirements are not mandated by federal law, were not required as part of the 2000 Permit, and constitute a new program or higher level of service.²⁴¹ Each provision is addressed separately, below.

1. Evaluation of Results of Monitoring Program and Effectiveness of BMP Implementation (Part 3.E.1(e))

The Claimants characterize Part 3.E.1(e) of the 2010 Permit as requiring that they “conduct a program effectiveness evaluation.”²⁴² This is an overly broad characterization. The language of the 2010 Permit requires the District, as Principal Permittee, to “evaluate, assess, and synthesize the results of the monitoring program and the effectiveness of the implementation of BMPs.”²⁴³

There is No New Program or Higher Level of Service

The requirements in Part 3.E.1(e) of the 2010 Permit do not constitute a new program or require a higher level of service. Part 3.D.1 of the 2000 Permit similarly required the District to “assess ...

²⁴⁰ 2010 Permit, Parts 3.E.1(e) and 4.I.1 (AR, pp. F0001395, F0001442).

²⁴¹ Test Claim, p. 19. Notably, the Claimants do not include Part 3.E.1(g) in their contentions, which repeats the requirement to “evaluate, assess, and synthesize the results of the monitoring program.” See 2010 Permit, p. 40 (AR, p. F001395).

²⁴² Test Claim, pp. 19-21.

²⁴³ 2010 Permit, Part 3.E.1(e), p. 40 (AR, p. F001395).

the effectiveness of implementation of permit requirements²⁴⁴ on storm water quality” and provide the “results of analyses from the Monitoring and Reporting Program.”²⁴⁵ Furthermore, the Monitoring and Reporting Program (MRP) of the 2000 Permit required that annual reports include “an assessment of the effectiveness of Ventura County SMP [Stormwater Management Program] requirements to reduce storm water pollution” and further required that the discharger “shall include an analysis of trends ... BMP effectiveness, and impacts on beneficial uses.”²⁴⁶ It further required an integrated summary of the results of analyses from the monitoring program, including “an analysis of the data to identify areas of the Program coverage which cause or contribute to exceedances of water quality standards or objectives...”²⁴⁷ Finally, it required that all Co-Permittees perform and submit a program evaluation under Part III of the MRP.²⁴⁸ As evidenced by the permit terms above, the requirement of the 2010 Permit is equivalent to what was required in the 2000 Permit; both permits use terms such as “assess” or “assessment,” “BMP effectiveness,” and “evaluate” or “evaluation” to describe reporting requirements related to the monitoring program and overall program implementation.²⁴⁹

Because the state has not imposed a new program or required a higher level of service, the challenged provision is not a state mandate subject to subvention.

The Provisions are Necessary to Meet Federal Law

With regards to assessing the effectiveness of BMP implementation, such an assessment is specifically required of MS4 permittees by federal regulations at 40 C.F.R. sections 122.26(d)(2)(v) and 122.42(c)(3).²⁵⁰ Section 122.26(d)(2)(v) requires an assessment of controls [BMPs] proposed to be implemented as a result of the Permittees’ stormwater quality management programs, while section 122.42(c)(3) requires that Permittees revise the assessment of their stormwater quality management program as necessary in each annual report based on actual program implementation outcomes (e.g., water quality monitoring data, reduction in non-stormwater discharges, changes in public behavior, BMP effectiveness data).²⁵¹ Furthermore, 40 C.F.R. section 122.41(h), which applies to all NPDES permits, including MS4

²⁴⁴ The majority of permit requirements in the 2000 Permit were requirements to implement various BMPs. According to federal regulations, “[b]est management practices (‘BMPs’) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of ‘waters of the United States.’ BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.” (See 40 C.F.R. §122.2.)

²⁴⁵ 2000 Permit, Part 3.D.1, p. 12 (AR, p. F004052).

²⁴⁶ See 2000 Permit, MRP No. CI 7388, Part I.B.3, pp. T-1 to T-2 (AR, pp. F004078-F004079). See, also, Part I.B.3, p. T-4, which required that the Annual Storm Water Report include “a progress report on sources of Pollutants of Concern (POCs), BMPs for their control, and *implemented BMP effectiveness*” (emphasis added). (AR, p. F004081).

²⁴⁷ *Ibid.*

²⁴⁸ *Id.*, Part III, p. T-9 (AR, p. F004086).

²⁴⁹ The mere use of different words such as ‘synthesize the results’ instead of ‘analysis of trends,’ ‘integrated summary of the results,’ and ‘analysis of ... impacts on beneficial uses’ does not transform it into a new requirement and, thus, make it a new program or higher level of service.

²⁵⁰ The Claimants only reference 40 C.F.R. § 122.42(c), which are the *additional* reporting requirements for MS4 permittees. MS4 permittees are also subject to all reporting requirements that apply to NPDES permittees generally.

²⁵¹ Note also that 40 C.F.R. § 122.34(d)(1) dictates that permits “must require the permittee to evaluate compliance with the terms and conditions of the permit, including the effectiveness of the components of its storm water management program, and the status of achieving the measurable requirements in the permit.”

permits, requires that the permittee furnish to the permitting agency any information that it requests to determine compliance with the permit.

Part 3.E.1(e) of the 2010 Permit is necessary for the Los Angeles Water Board to determine Permittees' compliance with the permit, namely requirements to meet the federal standards that require: (i) a prohibition on non-stormwater discharges to the MS4 and (ii) reduction of stormwater pollutants to the maximum extent practicable, and as necessary to prevent exceedances of water quality standards in the surface waters to which the MS4 discharges.²⁵²

Chapter 8 of U.S. EPA's MS4 Permit Improvement Guide includes a discussion of the federal requirements for monitoring, evaluation and reporting and corresponding model MS4 permit language. The guide states,

Evaluating the overall effectiveness of the municipal stormwater program should be done using information from the monitoring program, progress toward meeting measurable goals, and other indicators. Without assessing the effectiveness of the stormwater management program the permittee will not know which parts of the program need to be modified to protect and/or improve water quality and instead will essentially be operating blindly. Establishing a comprehensive monitoring and assessment program will enable the permittee to track progress in complying with permit provisions and implementing a program to protect water quality.²⁵³

Additionally, a 2008 U.S. EPA publication, "Evaluating the Effectiveness of Municipal Stormwater Programs," states that "EPA stormwater regulations require that the effectiveness of the SWMP [Stormwater Management Program] be evaluated, including assessment of SWMP implementation, evaluation of BMP effectiveness, and the extent to which improvements in stormwater outfall discharge quality have occurred."²⁵⁴

²⁵² In the case of the MEP standard, this provision is necessary to ensure that Permittees adapt their programs consistent with the evolving nature of the MEP standard. Federal regulations and companion U.S. EPA guidance convey the expectation that the level of specificity in a permit reconsidered and reissued every five years will increase over time whereby each successive permit becomes more refined, detailed, and expanded as needed, based on experience under the previous permit. (See Letter from U.S. EPA, Alexis Strauss, to State Water Board, April 10, 2008, concerning Los Angeles County Copermittee Test Claims Nos. 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (AR, pp. A003789-91), citing 55 Fed. Reg. 47990, 48052 ("EPA anticipates that storm water management programs will evolve and mature over time."); 64 Fed. Reg. 68722, 68754 (Dec. 8, 1999) ("EPA envisions application of the MEP standard as an iterative process."); and Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits (Sept. 1, 1996) ("The interim permitting approach uses BMPs in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards.").)

²⁵³ U.S. EPA, MS4 Permit Improvement Guide, p. 95 (AR, p F004537).

²⁵⁴ U.S. EPA, Evaluating the Effectiveness of Municipal Stormwater Programs (AR, p. F004349).

Similar requirements to Part 3.E.1(e) of the 2010 Permit are included in U.S. EPA issued MS4 Permits issued to the District of Columbia²⁵⁵, Middle Rio Grande,²⁵⁶ and Boise/Garden City.²⁵⁷ Inclusion of similar provisions in U.S. EPA-issued permits further supports the Los Angeles Water Board's determination that federal law requires the inclusion of the provision in the permit.

This Provision Is Not Unique to Local Government

The requirement to assess the effectiveness of an NPDES permitting program is not unique to local government. As noted above, 40 C.F.R. section 122.41(h) applies to all NPDES permits and requires that the permittee furnish to the permitting agency any information that it requests to determine compliance with the permit. This is a basic tenet of any NPDES permit.

Industrial stormwater dischargers are likewise specifically required to submit a "review and effectiveness assessment of all BMPs for each area of industrial activity and associated potential pollutant sources to determine if the BMPs are properly designed, implemented, and are effective in reducing and preventing pollutants in industrial storm water discharges and authorized NSWDS" and an "assessment of any other factors needed to comply with [permit] requirements."²⁵⁸

In addition, the State Water Board's MS4 permit for the California Department of Transportation requires submittal of an Overall Program Effectiveness Evaluation that is required to include, at a minimum:

- a) Assessment of program effectiveness in achieving permit requirements and measurable objectives.
- b) Assessment of program effectiveness in protecting and restoring water quality and beneficial uses.
- c) Identification of quantifiable effectiveness measurements for each BMP, including measurements that link BMP implementation with improvement of water quality and beneficial use conditions.
- d) Identification of how the Department will propose revisions to the SWMP to optimize BMP effectiveness when effectiveness assessments identify BMPs or programs that are ineffective or need improvement.²⁵⁹

The above clearly demonstrates that Claimants are not being treated any differently than non-local government entities.

²⁵⁵ See U.S. EPA, NPDES Permit No. DC0000221, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the District of Columbia (Oct. 7, 2011), Part 6.2.1, pp. 39-40.

²⁵⁶ See U.S. EPA, NPDES Permit No. NMR04A000, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the Middle Rio Grande Watershed (Dec. 22, 2014), Parts III.A and III.B.3, pp. 1, 7 of Part III.

²⁵⁷ See U.S. EPA, NPDES Permit No. IDS-027561, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Dec. 12, 2012), Part IV.C.3.c(ii)-(iii), p. 47.

²⁵⁸ State Water Resources Control Board, Order No. 2014-0057-DWQ, NPDES General Permit for Storm Water Discharges Associated with Industrial Activities, Part X.V., p. 59.

²⁵⁹ State Water Resources Control Board, Order 2012-0011-DWQ (as amended by Orders WQ 2014-0006-EXEC, WQ 2014-0077-DWQ, and WQ 2015-0036-EXEC), NPDES Statewide Storm Water Permit, Waste Discharge Requirements for State of California, Department of Transportation, Part E.2.m, pp. 50-51.

Other Mandates Exceptions Apply

In addition to the above, the Permittees, themselves, proposed a program effectiveness evaluation in their 2005 permit reapplication package. In Section 4: "Draft Permit," they propose the following language:

Annual Storm Water Report and Assessment – The Principal Co-permittee shall submit by October 1 of each year beginning the Year 2006, an Annual Storm Water Report and Assessment (Annual Report) documenting the status of the general program and individual tasks contained in the Ventura County SMP (SMP) as well as the results of the monitoring and reporting program. The Annual Report shall cover each fiscal year from July 1 through June 30 and shall include information necessary to assess the Discharger's compliance status relative to this Order and the effectiveness of implementation of permit requirements on storm water quality. The Annual Report shall include any proposed changes to the SMP as approved by the Management Committee.²⁶⁰

Additionally, in their proposed Attachment B to the Draft Permit, they propose the following as part of Annual Reporting Requirements:

"An assessment of the effectiveness of Ventura County SMP requirements to reduce storm water pollution. This assessment will be based upon the specific record-keeping information requirements in each major section of the permit, monitoring data and any other data the Co-permittees has, or is aware of that provides information on program effectiveness,"²⁶¹ and

"A comparison of the program implementation results to performance standards established in the Ventura County SMP."²⁶²

The Permittees' language proposes to provide the same information as required in Part 3.E.1(e) of the 2010 Permit though the wording is not identical.²⁶³

Additionally, the Ventura Countywide Stormwater Management Program, of which the Claimants are a part, states the following in its May 27, 2008 comment letter, "... Furthermore, we suggest that the permit allow the use of an Annual Report format that reflects the Program Effectiveness Assessment Guidance Manual developed by the California Association of Stormwater Quality

²⁶⁰ See Ventura Countywide Stormwater Quality Management Program "Submittal – Report of Waste Discharge [ROWD]: Application of Renewal of the Municipal NPDES Permit" (AR, p. A017882). Section 4 of the ROWD is a draft permit submitted by Permittees that "proposes activities that have proven to be successful..." (see AR, p. A017841).

²⁶¹ *Id.*, at p. A017897.

²⁶² *Ibid.*

²⁶³ See, *supra*, footnote 24. Also, the Permittees' proposal "to assess ... the effectiveness of implementation of permit requirements on storm water quality" is no different than the Claimants' characterization of the permit requirement as a "program effectiveness evaluation" in their Test Claim. The "program" is the stormwater management program in place to implement the requirements of the MS4 permit.

Agencies (CASQA) ...”²⁶⁴ Again, the Permittees are proposing an Annual Report format that includes program effectiveness assessment just as is required in Part 3.E.1(e). In fact, the CASQA Guidance Manual provides far more detail than Part 3.E.1(e), which as noted above simply states that Permittees shall “evaluate, assess, and synthesize the results of the monitoring program and the effectiveness of the implementation of BMPs.”²⁶⁵

2. Electronic Reporting Program and Form (Part 4.1.1)

Part 4.1.1 of the 2010 Permit requires the District, as the Principal Permittee, to develop an electronic reporting form to report the Permittees’ compliance with the Permit.²⁶⁶

There is No New Program or Higher Level of Service

Part 4.1.1 of the 2010 Permit is not a new program or higher level of service because Part 3.D.1 of the previous 2000 Permit required Permittees to submit an annual report that provides information necessary to assess the Permittees’ compliance with the permit.²⁶⁷ Therefore, Part 4.1.1 of the 2010 Permit, which changes the requirements of Part 3.D.1 of the 2000 Permit, does not amount to a new program because it is merely a refinement of the requirements of Part 3.D.1 of the 2000 Permit. The objectives of each provision are the same. The only difference is development of an electronic reporting form for the annual report information. Further, the Permittees state that, “[t]he Ventura [MS4] Program has over the years developed a comprehensive and relevant annual reporting format” and, as described in detail below, the Permittees had already submitted an electronic reporting format and associated forms to the Los Angeles Water Board prior to issuance of the 2010 Permit.²⁶⁸ Therefore, it also does not constitute a higher level of service.

Additionally, as stated in Finding 11 in the 2000 Permit, through agreement among the District and the other Permittees, the District committed to “coordinate permit activities;” “establish uniform data submittal format;” “prepare regulatory reports,” and “develop/prepare/generate all materials and data common to all Co-permittees” among other tasks.²⁶⁹ Hence, implementing Part 3.D.1 of the 2000 Permit falls under the responsibilities of the District, as Principal Permittee, a role the District chose to play. Therefore, the District’s responsibility to convene a working group and develop an electronic reporting form is not a new program given the previous requirements to coordinate permit activities, establish a data submittal format and develop all materials and data common to all Permittees.

Because the state has not imposed a new program or required a higher level of service, the challenged provision is not a state mandate subject to subvention.

²⁶⁴ See AR, pp. D000296-297. See also CASQA White Paper, draft, August 2007 (AR, pp. D000540-55). See generally CASQA, A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs (Feb. 2015), Executive Summary.

²⁶⁵ See, CASQA, Assessing the Effectiveness of Your Municipal Stormwater Program (2007), pp. 29-71.

²⁶⁶ See 2010 Permit, Part 4.1.1 (AR, p. F001442).

²⁶⁷ 2000 Permit, Part 3.D.1, p. 12 (AR, p. F004052).

²⁶⁸ See Comment Letter from Ventura Countywide Stormwater Quality Management Program, dated May 27, 2008 (AR, p. D00029); see also Letter from the Ventura Countywide Stormwater Quality Management Program to Ms. Tracy Egoscue, Executive Officer, dated May 7, 2010, regarding submittal of annual report electronic reporting format.

²⁶⁹ 2000 Permit, Finding 11 (AR, pp. F004043-44).

The Provisions are Necessary to Meet Federal Law

The Claimants contend that the “highly specific” electronic reporting program and format are not federally required. However, the requirement is far from specific in the 21st Century when most agencies conduct tracking and reporting through databases or spreadsheets. Part 4.I.1 of the 2010 Permit facilitates a more efficient and complete tracking and reporting of Permittee activities. Considering the multitude of departments within an individual municipality, it is difficult and inefficient to track and report required information in a non-electronic format. The development of an electronic reporting program allows Permittees to compile data required in the annual reports more efficiently and cost effectively.

As outlined in the Fact Sheet supporting the 2010 Permit, the Annual Report is composed of “... [a] Program Report to track and oversee the progress each Permittee is making towards full compliance with the various requirements of the MS4 Permit.”²⁷⁰ Federal regulations direct tracking and reporting of “[t]he status of implementing the components of the storm water management program that are established as permit conditions;” “[a] summary of data, including monitoring data, that is accumulated throughout the reporting year;” and “[a] summary describing the number and nature of enforcement actions, inspections, and public education programs,” among others.²⁷¹

Further, U.S. EPA’s MS4 Permit Improvement Guide states:

An important part of any municipal storm water program is to document and track information on activities the permittee undertakes to comply with the Permit Requirements ... In addition, adequate tracking is necessary to generate and provide reports of program progress not only to the permitting authority, but to a permittee’s internal management for planning and funding purposes ... To assist the permittee in ensuring appropriate data is gathered and analyzed, the permitting authority should be very clear regarding annual reporting requirements.²⁷²

U.S. EPA’s guide also suggests the following model MS4 permit provision, “Within the first [insert time frame which corresponds to the development of the monitoring program e.g. first two years of permit], the permittee must develop a tracking system to track the information required in the permit as well as the information required to be reported in the annual report.”²⁷³

For the above reasons, together with the Los Angeles Water Board’s finding that the provisions in the permit are based exclusively on federal law, the Commission should find that these provisions are required by federal law and defer to the Los Angeles Water Board’s determination that they are necessary to meet federal requirements.

Other Mandates Exceptions Apply

If the Commission nonetheless finds that the provisions exceed federal law, the provisions are not reimbursable because other mandates exceptions apply. First, the Board approved the

²⁷⁰ See 2010 Permit, Fact Sheet, Part V.I (AR, p. F003286).

²⁷¹ 40 C.F.R. § 122.42(c)(1), (c)(4), and (c)(6).

²⁷² U.S. EPA, MS4 Permit Improvement Guide, Chapter 8, p. 96 (AR, p. F004538).

²⁷³ Id., at p. 95 (AR, p. F004537).

substitution of the reporting program in the 2010 Permit with an electronic reporting program and set of forms developed by the Permittees. As explanation, the tentative 2010 Permit included a detailed reporting format in Attachment I comprised of a set of evaluative questions.²⁷⁴ In lieu of the reporting format proposed in Attachment I, the Permittees requested that they be able to continue to develop their own annual report format instead, subject to Los Angeles Water Board Executive Officer approval.²⁷⁵ They noted that they had already begun this process under the 2009 Permit.²⁷⁶ In the same comment letter, they acknowledged the requirement to develop an electronic reporting program, but did not provide further comment on, or object to, the requirement that the reporting program be *electronic*.²⁷⁷ In its written responses to comments, the Los Angeles Water Board responded that it would consider the Permittees' annual report format, which it had submitted in draft form under the 2009 Permit,²⁷⁸ pursuant to the delegated authority to the Board's Executive Officer to make changes to the reporting program.²⁷⁹ The Board did so, and the Ventura Countywide Stormwater Quality Management Program reports annually using the reporting format that the Permittees developed.²⁸⁰

Second, any associated incremental costs of developing an electronic reporting form are *de minimis*. This is because the Permittees completed the majority of the work prior to issuance of the 2010 Permit and, in fact, submitted their electronic reporting form to the Board *prior to issuance of the 2010 Permit*.²⁸¹ Therefore, Permittees incurred the majority of costs prior to issuance of the 2010 Permit. To the extent that the Permittees had to revise the draft electronic reporting forms prior to their approval four months later, the Board believes these costs to be *de minimus*.²⁸²

In summary, the Claimants proposed an annual reporting form and submitted it prior to issuance of the 2010 Permit. The Los Angeles Water Board's Executive Officer approved the form, substituting it for the reporting program requirements of Attachment I. The Claimants did not comment on or object to the requirement that the reporting be electronic, and the form they submitted was electronic (i.e., web-based).

For all these reasons, and for the additional reasons discussed in Section V above, the Commission should find that Parts 3.E.1(e) and 4.I.1 are not state mandates subject to subvention.

²⁷⁴ Tentative 2010 Permit, Attachment I, Reporting Program No. CI 7388 (AR, pp. F000471-96).

²⁷⁵ See Comment letter from Ventura Countywide Stormwater Quality Management Program, dated June 4, 2010 (AR, pp. F000785-92).

²⁷⁶ *Ibid.*

²⁷⁷ *Ibid.*

²⁷⁸ See Letter from the Ventura Countywide Stormwater Quality Management Program to Ms. Tracy Egoscue, Executive Officer, dated May 7, 2010, regarding submittal of annual report electronic reporting format.

²⁷⁹ See Responsiveness Summary, June 7, 2010 (AR, pp. F000928-29).

²⁸⁰ See Letter from Samuel Unger, Executive Officer, to Norma Camacho, Director, VCWPD, dated November 29, 2010, approving the revised annual reporting format for Reporting Program No. CI 7388 of the 2010 Permit.

²⁸¹ See Letter from the Ventura Countywide Stormwater Quality Management Program to Ms. Tracy Egoscue, Executive Officer, dated May 7, 2010, regarding submittal of annual report electronic reporting format.

²⁸² See Letter from Samuel Unger, Executive Officer, to Norma Camacho, Director, VCWPD, dated November 29, 2010, approving the revised annual reporting format for Reporting Program No. CI 7388 of the 2010 Permit.

C. Special Studies (Part 4.E.III.3(a)(1)(D)-(E); Attachment F, Section F; Part 4.E.IV.4; and Part 4.E.III.2(c)(3)-(4))

Part 4.E.III.3(a)(1)(D)-(E); Attachment F, Section F; Part 4.E.IV.4; and Part 4.E.III.2(c)(3)-(4) include requirements for three special studies as follows: (1) to conduct or participate in a hydromodification control study;²⁸³ (2) to update the technical guidance manual;²⁸⁴ and (3) to identify a list of eligible off-site mitigation projects and a schedule for completing off-site mitigation projects.²⁸⁵ Claimants allege these requirements are not mandated by federal law, were not required as part of the 2000 Permit, and constitute a new program or higher level of service.²⁸⁶ Each of these studies is addressed separately, below.

1. Hydromodification Control Study (Parts 4.E.III.3(a)(1)(D)-(E); Attachment F, Section F)

Challenged aspects of Parts 4.E.III.3(a)(1)(D)-(E) and Attachment F, Section F specify that the Permittees conduct a hydromodification control study or, alternatively, participate in the Southern California Storm Water Monitoring Coalition (SMC) Hydromodification Control Study (“HCS”).²⁸⁷

There is No New Program or Higher Level of Service

While the specific provisions concerning participation in the SMC HCS are new to the 2009 and 2010 Permits, their inclusion in hydromodification control requirements to be performed by the District, as Principal Permittee, does not result in imposition of a new program or require a higher level of service. The purpose of these provisions, as in the 2000 Permit, is to protect receiving waters from erosion and sediment loss due to land development and the resulting increases in peak stormwater runoff discharge rates.²⁸⁸

The purpose of the provisions of Part 4.E.III.3(a) of the Planning and Land Development Program in the 2010 Permit is identical to a provision in the 2000 Permit, Part 4.C “Programs for Planning and Land Development.”²⁸⁹ The approved Stormwater Quality Urban Impact Mitigation Plan (SQUIMP) for the 2000 Permit includes the following requirement pertaining to Peak Storm Water Runoff Discharge Rates: “*The Discharger shall control the post-development peak storm water runoff discharge rates to maintain or reduce pre-development downstream erosion, and to protect stream habitat.*”²⁹⁰

²⁸³ 2010 Permit, Part 4.E.III(a)(1)(D)-(E) (AR, p. F0001415); see also 2010 Permit, Attachment F, Section F (AR, pp. F0001509-10).

²⁸⁴ *Id.*, Part 4.E.IV.4 (AR, pp. F0001421-22).

²⁸⁵ *Id.*, Part 4.E.III.2(c)(3)-(4) (AR, pp. F0001413-14).

²⁸⁶ Test Claim, p. 22.

²⁸⁷ Hydromodification is the alteration of a stream’s hydrology and consequently channel dynamics and morphology due to increased peak storm water runoff discharge rates caused by development and the resultant increase in impervious surface area within an area draining to a stream. See, for example, U.S. EPA’s report “Modeling the Impacts of Hydromodification on Water Quantity and Quality” (AR, pp. F004355-438).

²⁸⁸ See generally, 2010 Permit, Findings B.15 to B.16 (AR, pp. F0001360-F0001361).

²⁸⁹ 2000 Permit, Part 4.C (AR, pp. F004056-57).

²⁹⁰ *Ibid.* (Emphasis added.); Ventura Countywide Urban Runoff and Storm Water NPDES Permit, Storm Water Quality Urban Impact Mitigation Plan (Jul. 27, 2000) (AR, p. F004095).

For comparison, the purpose articulated in the 2010 Permit, Part 4.E.III.3(a) is as follows:

*Each Permittee shall require all New Development and Redevelopment projects identified in subpart 4.E.II to implement hydrologic control measures, to **prevent accelerated downstream erosion and to protect stream habitat** ... The purpose of the hydrologic controls is to **minimize changes in post-development hydrologic storm water runoff discharge rates, velocities, and duration**. This shall be achieved by maintaining the project's pre-project storm water runoff flow rates and durations.²⁹¹*

Additionally, the 2000 Permit included a requirement to develop a technical manual, which included "criteria for the control of discharge rates and duration" to enable evaluation of impacts and establish performance standards pertaining to hydromodification.²⁹² The 2010 Permit provision to conduct a HCS was a refinement of this earlier requirement.

Impacts from hydromodification continued to be identified as a problem in the 2010 Permit as articulated in Finding B.16, which states in part that, "Recent studies conducted in California indicate that intermittent and ephemeral streams are even more susceptible to the effects of hydromodification ..."²⁹³ Consequently, the 2010 provisions represent an evolution of the provision in the 2000 Permit to address this problem, which was not resolved during the 2000 Permit term. A hydromodification control study was necessary to ensure compliance with Part 4.E.III.3(a) and prevent further impacts from hydromodification.

Second, the hydromodification control requirements, including the HCS requirement in the 2010 Permit, are fundamentally designed to achieve the Receiving Water Limitation provisions of MS4 permits. These provisions were part of the 2000 Permit and were carried over in the 2010 Permit. The 2000 Permit stated, "Discharges from the MS4 that cause or contribute to the violation of water quality standards or water quality objectives are prohibited."²⁹⁴ Hydromodification results in excessive erosion and siltation and, therefore, hydromodification controls are necessary to ensure that MS4 discharges do not cause or contribute to a violation of the water quality objectives for solid, suspended, or settleable materials and turbidity.²⁹⁵ Because the water quality objective for solid, suspended, or settleable materials is a narratively expressed objective, it was necessary to develop a consistent, measurable approach to evaluating whether MS4 discharges were violating the Receiving Water Limitation provisions of the permit.

Third, the HCS is not a new program or higher level of service because it was undertaken by the Claimants prior to issuance of the 2010 Permit. The 2010 Permit affirms this in Finding C.6, which states that the Order requires "continuation of the hydromodification study."²⁹⁶ The SMC, of which the District has been a voluntary member since its inception in 2001, proposed such a study as a

²⁹¹ 2010 Permit, Part 4.E.III.3(a) (AR, p. F0001414). (Emphasis added.)

²⁹² 2000 Permit, Part 4.C.2.b (AR, p. F004056).

²⁹³ *Id.*, Finding B.16 (AR, p. F0001361).

²⁹⁴ 2000 Permit, Part 2.A (AR, p. F004049) and 2010 Permit, Part 2.1 (AR, p. F0001391).

²⁹⁵ See Water Quality Control Plan for the Los Angeles Region, Chapter 3, pp. 3-37 to 3-39.

²⁹⁶ 2010 Permit, Finding C.6 (AR, p. F0001368).

research priority in its five-year research plan as early as 2002.²⁹⁷ Project 15 is “develop improved indicators of peak flow impacts.”²⁹⁸ Subsequently, the SMC produced a report in April 2005, “Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams”; the study objectives coincided with those in Parts 4.E.III.3(a)(1)(D)-(E) and satisfied subparts 4.E.III.3(a)(1)(D)(i)(I)-(II) and 4.E.III.3(a)(1)(E)(i).²⁹⁹ In March 2010, after adoption of the 2009 Permit, but prior to adoption of the 2010 Permit, two additional reports were completed to satisfy Parts 4.E.III.3(a)(1)(D)(i)(III) and 4.E.III.3(a)(1)(E)(ii)-(iii) to develop a numerical model, building on the conceptual model established in the April 2005 report.³⁰⁰ The SMC 2010-2011 Annual Report summarizes the status of this research priority, noting that it was 80% complete and that only two deliverables remained, neither of which are requirements of Part 4.E.III.3(a)(1)(D)-(E).³⁰¹ In conclusion, the purpose of the 2010 Permit provision, requiring a hydromodification control study, was based on a provision in the 2000 Permit with the same purpose. Furthermore, the requirements of the 2010 Permit provision were satisfied prior to adoption of the 2010 Permit with the completion of the technical reports noted above.

Even if the Commission finds that the HCS requirements are a new program or higher level of service, exceptions apply that preclude requiring subvention of funds.

The Provisions are Necessary to Meet Federal Law

CWA section 402(p)(3)(B)(iii) mandates that permits “require controls to reduce the discharge of pollutants to the maximum extent practicable, including ... *control techniques and system, design and engineering methods* ...” More specifically, federal regulations mandate a program to develop, implement and enforce controls to reduce the discharge of pollutants from MS4s that receive discharges from areas of new development and significant redevelopment.³⁰² In the 2010 Permit, as discussed above, the Los Angeles Water Board found it necessary for permittees to participate in the SMC HCS in order to establish appropriate control techniques and system-wide methods to address the impacts of hydromodification from MS4 discharges.

²⁹⁷ *Id.*, Finding C.7 (AR, p. F0001368). See also, Bernstein, Brock and Schiff, Kenneth (ed.). Stormwater Research Needs in Southern California. SCCWRP Technical Report 358. February 2002 (AR, pp. F005225-64).

²⁹⁸ 2010 Permit, Finding C.6 (AR, p. F0001368).

²⁹⁹ Coleman, Derrick, MacRae, Craig, and Stein, Eric D. Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. A report from the Stormwater Monitoring Coalition. SCCWRP Technical Report 450. April 2005. (AR, pp. A005814-A005894). A related report was produced in 2008, “Stream Channel Classification and Mapping Systems: Implications for Assessing Susceptibility to Hydromodification Effects in Southern California,” SCCWRP Technical Report 562. See p. ii. (AR, pp. F004641-82).

³⁰⁰ Booth, Derek B., Dusterhoff, Scott R., Stein, Eric D., Bledsoe, Brian P. Hydromodification Screening Tools: GIS-Based Catchment Analyses of Potential Changes in Runoff and Sediment Discharge. SCCWRP Technical Report 605. March 2010 (AR, pp. F0004683-4717); Bledsoe, Brian P., Hawley, Robert J., Stein, Eric D., Booth, Derek B. Hydromodification Screening Tools: Field Manual for Assessing Channel Susceptibility. SCCWRP Technical Report 606. March 2010. (AR, pp. F0004718-58).

³⁰¹ Stormwater Monitoring Coalition of Southern California, Annual Report 2010-2011, at pp. 4-6. Also noteworthy is that the project was funded in large part through a State Proposition 50 Grant in the amount of \$1,137,440.

³⁰² See 40 C.F.R. § 122.26(d)(2)(iv)(A)(2), which states “... [s]uch programs shall be based on: ... a description of ... control measures ... accompanied with an estimate of the expected reduction of pollutant loads” and that the program description shall include “[a] description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed.”

The Los Angeles Water Board considered progress under the 2000 Permit, and explained the basis for development of the permit provision as follows: “Post construction land development control requirements on new development and redevelopment offer the most cost-effective strategy to reduce pollutant loads to surface waters ...”³⁰³ Noting later in the same section that, “Such measures may include *hydromodification mitigation requirements*, minimization of impervious surfaces, integrated water resources planning, and low impact development guidelines.”³⁰⁴

In summary, the Los Angeles Water Board wrote the 2010 Permit to ensure that the most cost effective hydromodification control techniques are employed by requiring the District to conduct or participate in the SMC HCS. In addition, the HCS stream classification results support a focus on streams most susceptible to hydromodification impacts consistent with the MEP standard. The provision relies on a scientific study to identify hydromodification control practices that are both effective and practical in cost.

Further, the provisions of Attachment F, Section F are necessary to fulfill the requirements of section 308(a) of the Clean Water Act, which states that the permitting authority shall require permittees to provide reports and such other information as may be required to determine compliance with any “standard of performance,” such as hydromodification control criteria.

Section 8 of U.S. EPA’s MS4 Permit Improvement Guide explains that Phase I MS4s are required to conduct a stormwater monitoring and assessment program citing 40 C.F.R. sections 122.26(d)(1)(iii), d(2)(iii) and d(2)(v).³⁰⁵ Model permit language in Section 8.2 of U.S. EPA’s guide also recommends that a variety of environmental indicators be included in monitoring and assessment programs to measure the chemical, physical and biological impacts of the stormwater discharges.³⁰⁶ Indicators of hydromodification such as degree of imperviousness, as established by the HCS, are an important component of MS4 permit monitoring and assessment programs.

U.S. EPA’s 2009 report, “Modeling the Impacts of Hydromodification on Water Quantity and Quality,” declares “... USEPA and states recognized hydromodification as a stressor and a leading source of water quality impairment in streams and rivers. Hydromodification-induced stressors include chemical pollutants, pathogens, nutrients, suspended solids, and flow and habitat alteration.”³⁰⁷

Other Mandates Exceptions Apply

Claimants, as members of SMC, proposed such a study as a research need in 2002.³⁰⁸ The stated desired outcome of the project was to “produce indicators that quantitatively link a range of downstream impacts ... to increased peak flows due to land development and increases in

³⁰³ 2010 Permit, Fact Sheet (AR, p. F003256).

³⁰⁴ *Id.* (AR, p. F003261). (Emphasis added.)

³⁰⁵ U.S. EPA, MS4 Permit Improvement Guide, p. 95 (AR, p. F004537).

³⁰⁶ *Id.*, at p. 98-101 (AR, pp. F004540-43).

³⁰⁷ U.S. EPA, Modeling the Impacts of Hydromodification on Water Quantity and Quality, September 2009 (AR, pp. F004355-438).

³⁰⁸ “Stormwater Research Needs for Southern California” (Feb. 2002) [“Project 15. Develop improved indicators of peak flow impacts”] (AR, p. F005260).

impervious area. These indicators could help provide the basis for eventually establishing regulatory criteria for peak flows ...”³⁰⁹

In addition, any incremental costs for activities to implement the HCS requirement beyond previously existing requirements are *de minimis* and therefore not subject to subvention. The *de minimis* determination is supported because as discussed above the HCS was completed prior to the issuance of the 2010 Permit and was funded by a State awarded grant.³¹⁰

Further, as explained earlier, Part 4.A.2. of the 2010 Permit allows any Permittee(s) to request substitution of any program or BMP in Part 4 if the Permittee submits specified documentation. In the case of the HCS requirement, the Los Angeles Water Board gave permittees the opportunity to establish their own hydromodification control criteria to substitute for the interim hydromodification control criteria set forth in Part 4.E.III.3(a)(3)(A), and to do so by either conducting their own study or participating in the SMC HCS. The Los Angeles Water Board did not receive any written requests to substitute the hydromodification control study from the Claimants or to continue to rely on the interim hydromodification control criteria in lieu of conducting their own study or participating in the SMC HCS.

2. Technical Guidance Manual Update (Part 4.E.IV.4)

Part 4.E.IV.4 requires Permittees to update the Ventura County Technical Guidance Manual (TGM). Claimants contend that the 2000 Permit contained no requirement that the Permittees update the TGM and that the Clean Water Act does not require such updates.

There is No New Program or Higher Level of Service

Claimants’ contention that the 2000 Permit contained no requirement to update the TGM is misleading. What the 2000 Permit contained was a requirement to *prepare* such a manual no later than July 27, 2002.³¹¹ Nonetheless, the 2000 Permit also anticipated the need for modification, revision or amendment of the permittees’ Storm Water Quality Management Plan (SMP) of which the technical manual is a key element.³¹² The 2000 Permit provision was based on the Permittees’ proposal in their 1999 Storm Water Management Program plan, submitted as part of their permit reapplication package. For their programs for Land Development, the permittees proposed development of a stormwater quality master plan, including *design*

³⁰⁹ *Ibid.*

³¹⁰ See, for example, the following reports completed prior to the 2010 Permit: “Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams” (April 2005) (AR, pp. F004558-640); “Stream Channel Classification and Mapping Systems: Implications for Assessing Susceptibility to Hydromodification Effects in Southern California” (April 2008) (AR, pp. F004641-82); “Hydromodification Screening Tools: GIS-Based Catchment Analyses of Potential Changes in Runoff and Sediment Discharge” (March 2010) (AR, pp. F004683-717); and “Hydromodification Screening Tools: Field Manual for Assessing Channel Susceptibility” (March 2010) (AR, pp. F004718-58). See also, SMC Annual Reports 2008-09 and 2010-11, which note that the Hydromodification Study budget is funded entirely by a State Prop 50 Grant (pp. 4-7).

³¹¹ See 2000 Permit, Part 4.C.2 (AR, p. F004056). Because the 2000 Permit was the first instance that a technical manual was required to support implementation of the Planning and Land Development program, the focus of the 2000 Permit requirement was on the initial development of the technical manual rather than its update.

³¹² *Id.*, Part 4 (AR, p. F004053-54) (“[i]t is anticipated that the storm water quality management program, as delineated in the Ventura County SMP may need to be modified, revised, or amended from time-to-time in response to changed conditions, and to incorporate more effective approaches to pollutant control.”)

*guidelines for on-site controls.*³¹³ Therefore, the requirement in the 2010 Permit does not constitute a new program, but simply requires the update of the TGM proposed by permittees in 1999 and completed by the permittees in 2002 to be consistent with the 2010 Permit. The modified requirements do not rise to the level of imposing a new program or higher level of service where the objectives of the applicable federal requirements governing implementation of post-construction controls to limit pollutant discharges from areas of land development are the same.³¹⁴

Because the state has not imposed a new program or required a higher level of service, the challenged provision is not a state mandate subject to subvention.

The Provisions are Necessary to Meet Federal Law

The Los Angeles Water Board determined that the requirements are necessary to address pollutant discharges from areas of new development and significant redevelopment. Specifically, the TGM is necessary to implement the federal requirement that the Permittees' development planning program included "a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment."³¹⁵ The U.S. EPA's MS4 Permit Improvement Guide provides model permit language stating, "written procedures for implementing [the post-construction stormwater management program], including the components described in Parts 5.2 - 5.8 [including site performance standards], must be incorporated into the [Permittee's] SWMP document."³¹⁶ EPA provides additional language stating, "[t]he SWMP must describe the site design strategies, control measures, and other practices deemed necessary by the permittee to maintain or improve pre-development hydrology."³¹⁷

Additionally, at the time of permit development, EPA's Storm Water Menu of BMPs for the Minimum Measure: Post-Construction Stormwater Management in New Development and Redevelopment recommended a stormwater design manual. In 2007, the Stormwater Center published a model post-construction stormwater runoff control ordinance as a tool for MS4 permittees, which states:

Rather than place specific stormwater design criteria into an ordinance, it is often preferable to fully detail these requirements in a stormwater design manual. This approach allows specific design information to be changed over time as new

³¹³ See Land Use Planning and Zoning Stormwater Quality Master Planning Methodology and Criteria (LU-2), Define Design Guidelines for On-site Controls section of the February 1999 Ventura Countywide Stormwater Quality Management Program, which states, "the master plan will identify zones where on-site controls will be required and develop conceptual design criteria (e.g., unit storage volumes, unit discharge rates, length/width ratios) for each type of control measure. On-site control criteria that may be addressed by the master plan include biofilters (e.g., swales, filter strips), infiltration methods (e.g., basins, trenches, pervious paving materials), wet and dry detention basins and media filters. In addition, general criteria will be prepared for integrating treatment controls with other development features (e.g., landscaping, flood control, common areas)." (AR, p. F003754).

³¹⁴ See 40 C.F.R. § 122.26(d)(2)(iv)(A)(2).

³¹⁵ *Ibid.*

³¹⁶ U.S. EPA, MS4 Permit Improvement Guide, pp. 49-58 (AR, pp. F004491-500). Note that the terms and acronyms, including "stormwater management program," "SWMP," "Storm Water Quality Management Plan," and "SMP" are equivalent and refer to the same thing.

³¹⁷ *Ibid.*

information or techniques become available without requiring the formal process needed to change ordinance language. The ordinance can then require those submitting any development application to consult the current stormwater design manual for the exact design criteria for the stormwater management practices appropriate for their site.³¹⁸

As indicated above, this provision was necessary to meet the federal MEP standard and the federal prohibition on non-stormwater discharges to the MS4. The 2010 Permit integrates and advances the post-construction requirements in the Planning and Land Development program by incorporation of numeric metrics for Low Impact Development (LID) and an emphasis on on-site retention of stormwater.³¹⁹ LID BMPs are a cost effective means to reduce/eliminate pollutants in stormwater and non-stormwater discharges to the MS4.³²⁰ As indicated in EPA guidance, the update of the TGM was necessary to provide developers and municipal planning counter staff with the information to comply with these updated Planning and Land Development permit provisions.³²¹

The Claimants suggest that because the 2010 Permit associates MEP with the use of technology to control pollutants, studies and technical manuals do not address the MEP standard. However, it is because MEP is not defined in federal law or regulation and is meant to be an ever evolving and advancing concept, that studies and technical manuals are required. Without them, it is not possible to determine whether permittees are compliant with the MEP standard or not. Further, the Claimants independently acknowledge that one of the goals of the TGM is to “[e]nsure that new development and redevelopment projects reduce urban runoff pollution to the ‘maximum extent practicable’ (MEP).”³²²

The Los Angeles Water Board’s findings that the provisions are necessary to satisfy the federal MEP standard are further underscored by the inclusion of similar update requirements in

³¹⁸ “Model Post-Construction Stormwater Runoff Control Ordinance” (AR, p. E007344-45).

³¹⁹ U.S. EPA, MS4 Permit Improvement Guide (AR, pp. F004491-500).

³²⁰ See U.S. EPA, “Using Green Infrastructure to Protect Water Quality in Stormwater, CSO, Nonpoint Source and other Water Programs” (AR, p. A006797), stating:

Green infrastructure has a number of benefits: *Cleaner Water* -Vegetation and green space reduce the amount of stormwater runoff and, in combined systems, the volume of combined sewer overflows; *Enhanced Water Supplies* - Most green infiltration approaches result in stormwater percolation through the soil to recharge the groundwater and the base flow for streams; *Cleaner Air* - Trees and vegetation improve air quality by filtering many airborne pollutants and can help reduce the amount of respiratory illness; *Reduced Urban Temperatures* - Summer city temperatures can average 10°F higher than nearby suburban temperatures. High temperatures are linked to higher ground level ozone concentrations. Vegetation creates shade, reduces the amount of heat absorbing materials and emits water vapor - all of which cool hot air; *Increased Energy Efficiency* - Green space helps lower ambient temperatures and helps shade and insulate buildings, decreasing energy needed for heating and cooling; *Community Benefits* - Trees and plants improve urban aesthetics and community livability by providing recreational and wildlife areas and can raise property values; *Cost Savings* - Green infrastructure may save capital costs on digging big tunnels and stormwater ponds, operations and maintenance expenses for treatment plants, pipes, and other hard infrastructure; energy costs for pumping water; and costs of wet weather treatment and of repairing stormwater and sewage pollution impacts, such as streambank restoration..

³²¹ See, generally, U.S. EPA, MS4 Permit Improvement Guide, Chapter 5 (AR, pp. F004491-508).

³²² Ventura County, Ventura County Technical Guidance Manual for Stormwater Quality Control Measures Manual Update 2011 (July 13, 2011), p. 1-1.

implementation of land development storm water provisions in at least one EPA-issued permit. Section 4.2.3.1 of the MS4 Permit for the District of Columbia requires permittees to finalize a “Stormwater Management Guidebook” to be available for widespread use by land use planners and developers.³²³ The guidebook is required to provide regular updates and must include objectives and specifications for integration of stormwater management technologies, including on site retention practices.

For these reasons, the requirement to update the technical manual is federally mandated to meet the MEP standard. The fact that the U.S. EPA-issued permit for the District of Columbia MS4 also imposes comparable requirements independently demonstrates that the Los Angeles Water Board effectively administered federal requirements by including this permit provision and further supports the Board’s view that the challenged permit provision is required by federal law.

Other Mandates Exceptions Apply

First, while the Claimants are challenging Part 4.E.IV.4 of the 2010 Permit, they proposed a similar provision as part of an agreement between the Permittees, Heal the Bay and NRDC, which was presented to the Los Angeles Water Board before issuance of the 2009 Permit.³²⁴ Specifically, part of the agreement includes the following requirement in Part III.2(c), “[t]he Ventura County Technical Guidance Manual shall be revised to identify the alternative compliance measures and shall include the following requirements...”³²⁵ As requested by the Claimants and other parties to the agreement, the Board incorporated the aforementioned agreement into the 2009 Permit in its entirety, including this provision.³²⁶

Second, to the extent the Commission finds the provisions exceed federal requirements, any associated incremental costs of considering specific types of updates are *de minimis*. This is because the Permittees completed the majority of the work of updating the TGM prior to issuance of the 2010 Permit. The Claimants submitted a complete draft of the TGM to the Board *prior to issuance of the 2010 Permit*.³²⁷ The comment letter on the tentative 2010 Permit, dated June 2010, from the Ventura County Stormwater Management Program confirms that the draft TGM was completed and submitted to the Board for review.³²⁸ Therefore, Permittees incurred the majority of costs prior to issuance of the 2010 Permit. To the extent that the Permittees had to

³²³ U.S. EPA, NPDES Permit No. DC0000221, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the District of Columbia, Part 4.2.3.1, p. 15.

³²⁴ See letter dated April 10, 2009 from Claimants and other Ventura County MS4 Permittees along with the NRDC and Heal the Bay, requesting that the Board “wholly replace [Section E, III. New Development/Redevelopment Performance Criteria], and incorporate the Tentative Order language contained in Attachment A.” (AR, pp. E0001229, E0001232-35). Further, U.S. EPA, in a letter dated June 4, 2010, supported the permit language proposed by the NRDC, Heal the Bay, and the Permittees in their April 10, 2009 letter (AR, pp. F000781-F000782).

³²⁵ See letter dated April 10, 2009 from Claimants and other Ventura County MS4 Permittees along with the NRDC and Heal the Bay, requesting that the Board “wholly replace [Section E, III. New Development/Redevelopment Performance Criteria], and incorporate the Tentative Order language contained in Attachment A.” (AR, p. E0001233).

³²⁶ 2009 Permit (AR, pp. E001909-13).

³²⁷ See Ventura Countywide Stormwater Quality Management Program. Ventura County Technical Guidance Manual for Stormwater Quality Control Measures: Manual Update 2010. May 2010. (AR, pp. F004759-F005224.)

³²⁸ In a letter dated June 4, 2010, Ventura County Stormwater Management Program stated, “the Permittees have committed significant resources towards permit compliance and have accomplished many tasks. Most significantly was the submittal of the Revised Technical Guidance Manual for New and Re-Developments.” (AR, p. F000785.)

revise the 2010 draft TGM, the Water Boards believes these costs to be *de minimus*. Using the simple comparison of page numbers, the May 2010 pre-2010 Permit version was approximately 80% complete when compared to the final 2011 TGM.

Third, the Claimants have fee authority to implement these requirements and have not shown that they are required to raise taxes to fund them. Claimants may recover the costs of implementing this requirement through planning and land development fees or other fees.³²⁹ For these reasons, the Commission should find that no subvention is required to fund these updates.

3. List of Eligible Offsite Mitigation Projects and Schedule for Completing Offsite Mitigation Projects (Part 4.E.III.2(c)(3)-(4))

Part 4.E.III.2(c)(3)-(4) require Permittees to identify a list of eligible offsite mitigation projects and a schedule for completing offsite mitigation projects for situations in which onsite retention of stormwater is technically infeasible.³³⁰ As discussed above, the 2010 Permit advances the post-construction requirements in the Land Development and Planning Section by incorporation of numeric metrics for LID and on-site retention of stormwater. When on-site retention of stormwater runoff is not feasible, the permit provisions provide the necessary structure to ensure that appropriate locations are identified for offsite mitigation of the stormwater runoff created by the new development/redevelopment.

There is No New Program or Higher Level of Service

While the 2000 Permit did not contain a requirement to identify a list of eligible offsite mitigation projects and a schedule for completing them, it did require the Claimants to ensure, in cases of infeasibility, that developers “transfer the savings in cost [from the waiver of the treatment requirements of the SQUIMP] ... to a storm water mitigation fund operated by a public agency or a non-profit entity to be used to promote regional or alternative solutions for storm water pollution in the watershed.”³³¹ Therefore, the requirement in the 2010 Permit does not constitute a new program, as it simply requires refinement of the requirement in the 2000 Permit. The requirement to refine offsite mitigation requirements by developing a list of eligible projects and a schedule is fully consistent with U.S. EPA’s iterative process for implementation of the stormwater permit program. Further, the modified requirements do not rise to the level of imposing a new program or higher level of service where the objectives of the applicable federal requirements governing implementation of post-construction controls to limit pollutant discharges from areas of land development are the same.³³²

The Provisions are Necessary to Meet Federal Law

The Los Angeles Water Board determined that the requirements are necessary to address pollutant discharges from areas of new development and significant redevelopment. Specifically, a list of eligible offsite mitigation projects and a schedule is necessary to implement the federal

³²⁹ *Ibid.* Permittees note that the TGM “was updated to help the development community understand and interpret the complex land development permit requirements.”

³³⁰ 2010 Permit, Part 4.E.III.2(c)(3)-(4) (AR, pp. F0001413-14).

³³¹ See 2000 Permit, Attachment A “Ventura Countywide Stormwater Quality Urban Impact Mitigation Plan,” Section 11 “Waiver,” pp. A-14 to A-15. (AR, pp. F004104-05).

³³² See 40 C.F.R. § 122.26(d)(2)(iv)(A)(2).

requirement that the permittees' development planning program included "a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment."³³³ Appropriate options for offsite mitigation and a schedule is critical to such a master plan given that in some cases site conditions make onsite retention of stormwater technically infeasible. In these cases, offsite mitigation is necessary to meet the federal mandate to control the discharge of pollutants from new development and redevelopment.

The Los Angeles Water Board's findings that the provisions are necessary to satisfy the federal MEP standard are further underscored by the inclusion of similar requirements in at least one U.S. EPA-issued permit.³³⁴ Section 4.1.3 of the MS4 Permit for the District of Columbia requires the permittee to develop, public notice, and submit to U.S. EPA for review and comment an off-site mitigation and/or fee-in-lieu program to be utilized when projects will not meet stormwater management performance standard as defined in Section 4.1.1. The permittee has the option of implementing an off-site mitigation program, a fee-in-lieu program, or both.

Additionally, in its MS4 Permit Improvement Guide in Chapter 5 "Post-Construction or Permanent/Long-term Stormwater Control Measures," U.S. EPA includes the development of an off-site mitigation program as an example permit provision to be included consistent with federal requirements.³³⁵

The fact that the U.S. EPA-issued permit for the District of Columbia MS4 also imposes comparable requirements independently demonstrates that the Los Angeles Water Board effectively administered federal requirements by including this permit provision and further supports the Board's view that the challenged permit provision is required by federal law.

Other Mandates Exceptions Apply

First, the Claimants proposed this provision as part of an agreement among the Permittees, Heal the Bay, and NRDC, which was presented to the Los Angeles Water Board before issuance of the 2009 Permit.³³⁶ Specifically, part of the agreement includes the exact language regarding offsite mitigation that the Claimants are now challenging in Part III.2(c)(3)-(4) of the 2010 Permit.³³⁷ As requested by the Claimants and other parties to the agreement, the Board

³³³ *Ibid.*

³³⁴ U.S. EPA, NPDES Permit No. DC0000221, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the District of Columbia, Section 4.1.3.

³³⁵ U.S. EPA, MS4 Improvement Guide, Section 5.2.4.d in "Example Permit Provisions" text box, p. 53. (AR, p. F004495).

³³⁶ See letter dated April 10, 2009 from Claimants and other Ventura County MS4 Permittees along with the NRDC and Heal the Bay, requesting that the Board "wholly replace [Section E, III. New Development/Redevelopment Performance Criteria], and incorporate the Tentative Order language contained in Attachment A." (AR, pp. E0001229-35). Further, U.S. EPA, in a letter dated June 4, 2010, supported the permit language proposed by NRDC, Heal the Bay, and the Permittees in their April 10, 2009 letter (AR, pp. F000781-F000782).

³³⁷ See letter dated April 10, 2009 from Claimants and other Ventura County MS4 Permittees along with the NRDC and Heal the Bay, requesting that the Board "wholly replace [Section E, III. New Development/Redevelopment Performance Criteria], and incorporate the Tentative Order language contained in Attachment A." (AR, pp. E0001233).

incorporated the aforementioned agreement into the 2009 Permit in its entirety, including this provision.³³⁸

Second, any incremental costs to develop a list of eligible offsite mitigation projects and a schedule are *de minimis* and therefore not subject to subvention. The *de minimis* determination is supported because, according to the 2011-2012 Annual Report covering the period July 1, 2011-June 30, 2012, the Permittees evaluated the potential need for offsite mitigation and found that “the offsite need for any one project is likely to be small enough to be manageable in the public right-of-way of the permitting agency.”³³⁹ Thus, a short list of eligible projects in the public right-of-way would be sufficient.³⁴⁰

Third, these provisions allow for payment by developers toward an offsite mitigation project identified on the list of eligible projects. As noted earlier, the Claimants have fee authority to implement these requirements and have not shown that they are required to raise taxes to fund them. Claimants may recover the costs of implementing these requirements through planning and land development fees or other fees. For these reasons, the Commission should find that no subvention is required to fund these updates.

For all these reasons, and for the additional reasons discussed in Section V above, the Commission should find that Part 4.E.III.3(a)(1)(D)-(E); Attachment F, Section F; Part 4.E.IV.4; and Part 4.E.III.2(c)(3)-(4) are not state mandates subject to subvention.

D. Watershed Initiative Participation (Part 4.B)

Part 4.B of the 2010 Permit requires the Principal Permittee (the District) to participate in: (i) water quality meetings for watershed management and planning, including those of the Southern California Stormwater Monitoring Coalition (SMC), (ii) the SMC regional bioassessment monitoring program, and (iii) the Southern California Bight Regional Monitoring Survey.³⁴¹ Claimants allege these requirements are not mandated by federal law, were not required as part of the 2000 Permit, and constitute a new program or higher level of service.³⁴²

³³⁸ 2009 Permit (AR, pp. E001911-12).

³³⁹ Ventura County, Ventura Countywide Stormwater Quality Management Program Annual Report: 2011-2012 Permit Year, Section 5.4.1, p. 5-9.

³⁴⁰ Note that the Claimants overstate the requirements of the provisions at issue. The Claimants state that, “the District ... will need to develop a complete off-site mitigation program” and that this will include “mapping and surveying locations that are suitable for off-site mitigation” (Test Claim, p. 28). However, Part 4.E.III.2(c)(3)-(4) of the 2010 Permit only requires the following: (i) “a list of eligible public and private offsite mitigation projects available for funding shall be identified by the Permittees and provided to the project applicant” and (ii) “[t]he Permittee(s) shall develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects.” (AR, pp. F0001413-14). The 2010 Permit does not require development of a “complete off-site mitigation program,” “a comprehensive list of projects,” or “mapping and surveying of locations that are suitable for off-site mitigation.”

³⁴¹ 2010 Permit, Part 4.B (AR, pp. F0001396-97).

³⁴² Test Claim, p. 29.

1. Participation in Water Quality Meetings Including the SMC (Part 4.B.1)

Challenged aspects of Part 4.B.1 specify that the District as Principal Permittee shall participate in water quality meetings, including the SMC.³⁴³

There is No New Program or Higher Level of Service

Claimants mistakenly state that the 2000 Permit contained no requirement for the District to participate in regional groups. The 2000 Permit required District participation in water quality meetings of watershed management planning and specified three specific regional groups.³⁴⁴ In contrast, the 2010 Permit only requires District participation in SMC meetings, reducing the number of required meetings to attend. The language of the 2000 Permit and the 2010 Permit is almost identical.

The 2000 Permit states, “[t]he Principal Co-Permittee shall participate in appropriate water quality meetings of watershed management planning ...”³⁴⁵ While the 2010 Permit states, “[t]he Principal Permittee shall participate in water quality meetings for watershed management and planning...”³⁴⁶

Additionally, the SMC, an intergovernmental coalition³⁴⁷, was formed in 2001 by cooperative, voluntary agreement of a number of Phase I MS4 Permittees, including the District. The parties to that agreement, including the District, renewed the “Cooperative Agreement for Participation in the Southern California Stormwater Monitoring Coalition” in 2008 prior to issuance of the 2009 Permit.³⁴⁸ This agreement includes a voluntary commitment on the part of the signatories to appoint a member and alternate to the SMC Steering Committee and to meet “from time to time ... but at least every six months.”³⁴⁹

Because the state has not imposed a new program or required a higher level of service, the challenged provision is not a state mandate subject to subvention.

The Provisions are Necessary to Meet Federal Law

The provision requiring participation in water quality meetings for watershed management and planning is included to meet the federal requirement to implement a stormwater management program; one element of a stormwater management program as articulated in federal regulations is intergovernmental coordination.³⁵⁰

³⁴³ 2010 Permit, Part 4.B.1, p. 41 (AR, p. F0001396).

³⁴⁴ 2000 Permit, Monitoring and Reporting Program No. CI-7388, p. T-7 (AR, p. F004084).

³⁴⁵ *Ibid.*

³⁴⁶ 2010 Permit, Part 4.B.1, p. 41 (AR, p. F0001396).

³⁴⁷ See Southern California Stormwater Monitoring Coalition, “About SMC.”

³⁴⁸ AR, pp. F005336-56.

³⁴⁹ *Id.*, pp. F005338-39.

³⁵⁰ See 40 C.F.R. § 122.26(d)(2)(iv) regarding required elements of permittees’ stormwater management programs.

In the introduction to U.S. EPA's MS4 Permit Improvement Guide, U.S. EPA states that, "[p]artnerships and agreements between permittees ... can minimize unnecessarily repeating activities and result in using available resources as efficiently as possible."³⁵¹ Additional documentation of EPA's direction regarding watershed-based NPDES permitting and permit implementation is in a 2003 memorandum "Watershed-Based NPDES Permitting Policy Statement."³⁵² The above EPA guidance documents note that regional collaboration may reduce overall costs and improve environmental outcomes when compared to the alternative of each permittee implementing its own program separately.

Other Mandates Exceptions Apply

Any incremental costs of participation in water quality meetings and, specifically, those of the SMC beyond previously existing requirements are *de minimis* or less stringent than previous requirements and, therefore, not subject to subvention. The *de minimis* determination is supported because as noted earlier, the cooperative agreement signed by the District only requires participation in SMC meetings once every six months and the 2010 Permit provision eliminated the requirement to participate in the meetings of three other regional groups, which had been included in the 2000 Permit.

2. Participation in Regional Water Quality Programs (Part 4.B.2)

Challenged aspects of Part 4.B.2 specify that the District as Principal Permittee shall participate in regional water quality programs, specifically, the Southern California regional bioassessment and the regional Southern California Bight monitoring survey.

There is No New Program or Higher Level of Service

Part 4.B.2 of the 2010 Permit is a logical outgrowth of Parts II.A.2.d and II.A.2.f of the Monitoring and Reporting Program for the 2000 Permit and, therefore, is not a new program or higher level of service. The 2000 Permit required participation with the Southern California Coastal Water Research Project (SCCWRP) in stormwater studies and required Permittees to develop a workplan for an instream bioassessment monitoring program and submit it for Los Angeles Water Board Executive Officer approval. Specifically, the 2000 Permit included the following provisions:³⁵³

A. The Discharger shall implement the Countywide Monitoring Plan, ... which addresses ... watershed monitoring. To achieve this, the Discharger shall:...

2. Conduct receiving water and watershed monitoring:...

d. The Discharger shall participate with the Southern California Coastal Water Research Project (SCCWRP) in storm water studies, as set forth in the signed Memorandum of Agreement...

³⁵¹ U.S. EPA, MS4 Permit Improvement Guide, p. 7 (AR, p. F004449).

³⁵² U.S. EPA, Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Policy Statement (Jan. 7, 2003) (AR, pp. F004318-21).

³⁵³ See 2000 Permit, Monitoring and Reporting Program, Part II.A.2, p. T-7 (AR, p. F004084.)

f. The Discharger shall develop a work plan for an instream bioassessment monitoring program and submit it to the Regional Board Executive Officer for approval no later than January 27, 2001. On approval by the Regional Board Executive Officer, the Discharger shall implement the instream bioassessment monitoring program...

Additionally, Finding 7 of the 2000 Permit states, “[t]he Discharger intends to sign an agreement to participate in the Regional Monitoring Program established for Southern California municipal programs under the guidance of the Southern California Coastal Water Research Project.”³⁵⁴ In 2002, the SMC developed a workplan of projects that participating agencies, including the District, identified as important to voluntarily fund, including a regional bioassessment program and, in 2007, the SMC produced a specific workplan for the regional bioassessment program.³⁵⁵ The regional bioassessment program was fully developed as of 2007-2008 and monitoring has been conducted by the District under this program since 2009.³⁵⁶

The District began participating in the Southern California Bight Project (SCBP), which SCCWRP facilitates, in 2003 and has participated in each regional survey since that time.³⁵⁷ The SCBP is designed to, in large part, assess the impacts of stormwater discharges on the coastal ecology of Southern California from Point Conception north of Ventura County to the U.S.-Mexico border.

Finding C.6 of the 2010 Permit states that, “[t]his Order requires ... continuation of ... participation in the Southern California Regional Bioassessment Program and Southern California Bight Project (SCBP).” Finding C.7 of the 2010 Permit states that, “[t]he Principal Permittee is a member of the Southern California Coastal Water Research Project (SCCWRP) Commission. The Principal Permittee also participates in the Regional Monitoring Program and research partnerships, such as the Southern California Storm Water Monitoring Coalition (SMC) and the Bioassessment Working Group.”³⁵⁸

The 2010 Permit eliminates the requirement for the Permittees to submit an instream bioassessment monitoring program and instead states that the District, as Principal Permittee, consents to participate in the SMC Regional Monitoring Program and that Co-Permittees shall conduct bioassessment at one fixed site in each of three watersheds on an annual basis.³⁵⁹ The difference under the 2010 Permit was the evolution of the monitoring program to a probabilistic sampling site design, though the number of sites remained the same, with three long-term fixed sites to assess trends. The Permittees acknowledged the value of the bioassessment monitoring program and that they did not object to the additional requirement of fixed sites.³⁶⁰

³⁵⁴ See 2000 Permit, Finding 7, pp. 2-3 (AR, p. F004042-43).

³⁵⁵ SCCWRP, Regional Monitoring of Southern California's Coastal Watersheds, December 2007. See, in particular, Table 1 and Figure 10, listing participants and the timeline of activities, respectively. (AR, pp. A010347-79.)

³⁵⁶ See SMC Annual Report 2007-08, pp. 2-4 (AR, pp. F005328-30).

³⁵⁷ See Southern California Bight 2003 Regional Marine Monitoring Survey-Coastal Ecology Workplan (June 2003) (AR, pp. F005265-92).

³⁵⁸ See 2010 Permit, Findings, Part C, p. 13 (AR, pp. F001368).

³⁵⁹ See 2010 Permit, Attachment F, Part I.1(a)-(b), p. F-17 (AR, p. F001511); Fact Sheet, Part V.B, p. 10-11 (AR, at pp. F003244-F003245). See also Letter Re: Proposed Modification to Instream Bioassessment Monitoring Work Plan (March 20, 2008) (AR, at p. C000631-C000632).

³⁶⁰ See Responsiveness Summary (June 7, 2010) (AR, p. F000938).

The Provisions are Necessary to Meet Federal Law

The provisions of Part 4.B.2 are necessary to fulfill the requirements of CWA section 308(a), which states that the permitting authority shall require permittees to provide reports and such other information as may be required to determine compliance with any limitation such as receiving water limitations as contained in Part 2 of the 2010 Permit.³⁶¹ Section 8 of U.S. EPA's MS4 Permit Improvement Guide points out that Phase I MS4s are required to conduct a stormwater monitoring and assessment program, citing 40 C.F.R. sections 122.26(d)(1)(iii), d(2)(iii) and d(2)(v).³⁶² Model permit language in Section 8.2 of U.S. EPA's guide enumerates the objectives of a monitoring and assessment program, including assessing the chemical, physical, and biological impacts to receiving waters resulting from stormwater discharges, and assessing the overall health and evaluating long-term trends in receiving water quality.³⁶³ The guide also recommends that a variety of environmental indicators be included in monitoring and assessment programs.³⁶⁴ Bioassessment and the SCBP's coastal monitoring are critical components of MS4 permit monitoring and assessment programs to meet the abovementioned objectives because they provide direct measures of chemical, physical and biological impacts and of the overall health of receiving waters.

The guide further states, "[t]he permit writer could consider the role of partnerships among the MS4s in establishing and implementing the monitoring programs so that any data collected is robust, useful, and meaningful. ... By doing so resources may be used more efficiently and results of testing may be more robust."³⁶⁵ The guide provides a link to SMC's bioassessment program as an example of monitoring requirements to include in MS4 permits.³⁶⁶

These provisions are very similar to those of the EPA-issued MS4 permit for the District of Columbia, which requires that the monitoring program "evaluate the health of the receiving waters, to include biological and physical indicators such as macroinvertebrates and geomorphologic factors."³⁶⁷ The permit further notes that the monitoring program design "must be adequate to ensure data are statistically significant..." supporting the 2010 Permit requirement to include probabilistic sites along with fixed sites in each watershed on an annual basis.³⁶⁸

Other Mandates Exceptions Apply

First, any incremental costs of participation in regional bioassessment are *de minimis* and therefore not subject to subvention. The *de minimis* determination is supported by the SMC 2007-08 Annual Report, which states that, "the cost of implementing this [Regional Watershed

³⁶¹ See generally 2010 Permit, Part 2 (AR, p. F0001391).

³⁶² U.S. EPA, MS4 Permit Improvement Guide, p. 95 (AR, p. F004537).

³⁶³ *Id.*, at p. 97 (AR, p. F004539).

³⁶⁴ *Id.*, at p. 98-101 (AR, pp. F004540-43).

³⁶⁵ *Id.*, at p. 99 (AR, p. F004541).

³⁶⁶ *Ibid.*

³⁶⁷ See U.S. EPA, NPDES Permit No. DC0000221, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to the District of Columbia (Oct. 7, 2011), p. 33.

³⁶⁸ *Ibid.*

Monitoring] program would be negligible because the Working Group identified significant redundancies and inefficiencies in existing monitoring programs that could be reprogrammed towards a regional design.”³⁶⁹ Additionally, Claimants report a cost of only \$200 associated with implementation of Part 4.B.2(b).³⁷⁰

Second, the Los Angeles Water Board received and accommodated a request from the Ventura County MS4 Permittees to substitute part of the regional bioassessment requirements based on the 2015-2020 SMC Regional Program agreed upon by the SMC, including the District.³⁷¹ No other requests for substitution of the requirements of Part 4.B.2 were received.

For all these reasons, and for the additional reasons discussed in Section V above, the Commission should find that Part 4.B is not a state mandate subject to subvention.

E. Vehicle and Equipment Wash Areas (Part 4.G.I.3(a))

Part 4.G.I.3(a) of the 2010 Permit requires each permittee to eliminate discharges of wash waters from vehicle and equipment washing by implementing one of four measures at existing facilities with vehicle or equipment wash areas.³⁷² This requirement, including the specified measures, was carried over from the 2000 Permit. The 2000 Permit, however, included a provision exempting fire fighting vehicles from the requirement.³⁷³ While this requirement was carried over, neither the 2009 Permit nor 2010 Permit retained the exemption for fire fighting vehicles. Thus, the requirement applies to all public agency vehicles and equipment wash areas. Claimants allege that the specific methods for elimination of wash water discharges as applied to fire fighting vehicles are not mandated by federal law, were not required as part of the 2000 Permit, and constitute a new program or higher level of service.³⁷⁴

The Provision is Necessary to Meet Federal Law

Claimants allege that the specific methods for elimination of wash water discharges as applied to fire fighting vehicles are not mandated by federal law. Claimants, however, erroneously assert that the applicable federal standard for non-stormwater discharges is the MEP standard. As explained above, non-stormwater discharges are not subject to the MEP standard applicable to stormwater discharges.³⁷⁵ Rather, this provision is necessary to comply with Clean Water Act section 402(p)(3)(B)(ii), which requires that MS4 permittees effectively prohibit non-stormwater discharges to the MS4. The Los Angeles Water Board’s decision to not retain the exemption for fire fighting vehicles, and thus subject those vehicles to the same requirements as other public

³⁶⁹ SMC Annual Report 2007-08, p. 3. (AR, p. F005329).

³⁷⁰ Test Claim, p. 33.

³⁷¹ Los Angeles Water Board, “Response to Request to Confirm Level of Effort Prescribed in Order No. R4-2010-0108, Attachment F, Section I.1.a.1.a.i in accordance with New Five Year Study Design for SMC Regional Bioassessment Program.” Letter to Mr. Gerhardt Hubner, Deputy Director Ventura County Watershed Protection District (June 4, 2015).

³⁷² 2010 Permit, Part 4.G.I.3(a) (AR, p. F0001434).

³⁷³ 2000 Permit, Part 4.E.4 (AR, p. F004060).

³⁷⁴ Test Claim, p. 33.

³⁷⁵ See State Board Order WQ 2009-0008, p. 4 (withdrawn on other grounds); see also State Water Board Order WQ 2015-0075 (2012 LA County MS4 Permit), pp. 62-63, confirming that non-stormwater discharges to the MS4s under the Clean Water Act are not subject to the MEP standard applicable to stormwater discharges.

agency vehicles and equipment wash areas, was based exclusively on the federal law mandate requiring MS4 permittees to effectively prohibit non-stormwater discharges to the MS4.

Federal MS4 permit application requirements specify that an applicant must demonstrate adequate legal authority to "[p]rohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer;" and "[c]ontrol through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water."³⁷⁶ Federal regulations define the term "illicit discharges" as: "any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire-fighting activities."³⁷⁷ In other words, since illicit discharges are not authorized by the Clean Water Act, they must be prohibited. Moreover, MS4 applicants must also propose "a program, including a schedule, to detect and remove (or require the discharger to the [MS4] to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."³⁷⁸ This proposed program shall include "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the [MS4]" for "all types of illicit discharges."³⁷⁹ Certain categories of non-stormwater discharges are not required to be treated as illicit unless the category has been identified as a source of pollution. These include categories of discharges such as from foundation drains, springs, crawl space pump water, air conditioning condensation, individual residential car washing and dechlorinated swimming pool discharges.³⁸⁰ Notably, federal regulations provide no exception for wash waters from non-residential vehicles or fire fighting vehicles. As such, fire fighting vehicle washing constitutes illicit discharges and must be prohibited from being discharged to the MS4 in compliance with the Clean Water Act.

MS4 permittees often own and maintain their own fleet of vehicles that may include cars, trucks (both fire fighting and non-fire fighting), ambulances, buses, and other types of vehicles.³⁸¹ Municipal vehicle washing generally involves the removal of dust, dirt, and other debris from the exterior of trucks and other vehicles, as well as the cleaning of cargo areas and engines and other mechanical parts. While the 2000 Permit specifically exempted fire fighting vehicles from the wash water discharge prohibition, U.S. EPA and other sources recognize municipal vehicle wash water as a source of pollutants. According to U.S. EPA, "[m]unicipal vehicle washing can generate dry weather runoff contaminated with detergents, oils, grease, and heavy metals."³⁸² In the 2010 Permit, the Los Angeles Water Board found that facilities with paved surfaces subject to frequent motor vehicular traffic or facilities that perform vehicle repair, maintenance, or fueling are potential sources of pollutants.³⁸³ The California Stormwater Quality Association (CASQA) also recognizes

³⁷⁶ 40 C.F.R. § 122.26(d)(2)(i)(B) and (C).

³⁷⁷ *Id.* § 122.26(b)(2). Notably, the references to "fire-fighting activities" refers to emergency activities only. Washing fire fighting vehicles is not considered an emergency activity.

³⁷⁸ *Id.* § 122.26(d)(2)(iv)(B).

³⁷⁹ *Id.* § 122.26(d)(2)(iv)(B)(1).

³⁸⁰ *Ibid.*

³⁸¹ U.S. EPA's Stormwater Menu of BMPs for the Minimum Measure: Pollution Prevention/Good Housekeeping for Municipal Operations: Municipal Vehicle and Equipment Washing (June 2006).

³⁸² *Ibid.*

³⁸³ 2010 Permit, Finding B.12 (AR, p. F0001360).

municipal vehicle washing as a source of pollutants.³⁸⁴ In its Municipal Handbook, the stated purpose of which is to provide general guidance for selecting and implementing BMPs to reduce pollutants in runoff from municipal operations, CASQA notes that “[w]ash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff.”³⁸⁵

The Claimants did not comment on this provision to the Board prior to issuance. Neither have Claimants provided any evidence to the Board or the Commission indicating that washing of fire fighting vehicles is different from other non-residential vehicle washing and is not a source of pollutants to the MS4. Further, the Claimants state that Ventura County is required to retrofit 30 fire stations to comply with the new permit requirement. Claimants, however, neglect to mention that Ventura County or any other MS4 permittee can choose to comply with the non-stormwater discharge prohibition by choosing not to wash fire fighting vehicles on-site. Instead, they can contract the services of commercial truck washes that discharge to the sanitary sewer system as opposed to the MS4. Or Claimants might consider building municipal-operated vehicle washing facilities for their entire fleet of vehicles. These options may be less costly and could eliminate the cost of constructing and maintaining additional BMPs on-site.

Each of the specified measures in the challenged permit provision are intended to prevent or reduce the discharge of pollutants to the MS4 when municipal vehicle and equipment washing is conducted on-site. These measures also constitute regularly accepted BMPs. One of the BMPs recommended by CASQA in its Municipal Handbook is to:

Design wash areas to properly collect and dispose of wash water when engine cleaning is conducted and when chemical additives, solvents, or degreasers are used. This may include installation of sumps or drain lines to collect wash water or construction of a berm around the designated area and grading of the area to collect wash water as well as prevent stormwater run-on.³⁸⁶

In addition, U.S. EPA’s *MS4 Permit Improvement Guide* includes the following example of MS4 permit language addressing equipment and vehicle washing from municipal facilities:

Equipment and vehicle washing – The discharge of equipment and vehicle wash wastewater to the MS4 or directly to receiving waters from municipal facilities is prohibited. The permittee may meet this requirement by either installing a vehicle wash reclaim system, capturing and hauling the wastewater for proper disposal, connecting to sanitary sewer (where applicable and approved by local authorities), ceasing the activity, and/or applying for and obtaining a separate stormwater permit.³⁸⁷

³⁸⁴ CASQA’s membership is comprised of a diverse range of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout the state. Claimants are members of CASQA.

³⁸⁵ CASQA Municipal Handbook (Jan. 2003) (AR, p. A003012).

³⁸⁶ *Id.* (AR, p. A003013).

³⁸⁷ U.S. EPA, *MS4 Improvement Guide* (Apr. 2010), Section 6.3.2.e, (AR, p. F004514).

Inclusion of similar requirements in U.S. EPA-issued permits likewise supports the Los Angeles Water Board's determination of federal necessity. The Supreme Court in *Department of Finance* observed that U.S. EPA- issued permits do not contain requirements to provide trash receptacles at transit stops (a requirement of the 2001 Los Angeles County MS4 Permit), and found that the absence of such conditions in U.S. EPA-issued permits "undermines the argument that the requirement was federally mandated."³⁸⁸ Here, U.S. EPA's permit issued for the District of Columbia MS4 in 2011 (modified in 2012) includes a substantially similar provision with specified control measures pertaining to vehicle and equipment wash water:

For vehicle and equipment wash areas and municipal facilities constructed, redeveloped, or replaced, the permittee shall eliminate discharges of wash waters from vehicle and equipment washing into the MS4 by implementing any of the following measures at existing facilities with vehicle or equipment wash areas:

1. Self-contain, and haul off-site for disposal;
2. Equip with a clarifier; or
3. Equip with an alternative pre-treatment device³⁸⁹

The fact that the U.S. EPA-issued permit for the District of Columbia MS4 also imposes comparable requirements independently demonstrates that the Los Angeles Water Board effectively administered federal requirements by including this permit provision and further supports the Board's view that the challenged permit provision is required by federal law.

There is No New Program or Higher Level of Service

The removal of the exemption for fire fighting vehicles starting in the 2009 Permit reflects the operation of federal law as implemented in the two prior permits issued to Claimants. In the 1994 Permit, the Board established the required federal prohibition on non-stormwater discharges as follows: "Non-storm water discharges entering storm drainage systems without a NPDES permit are prohibited. This prohibition does not apply to the following types of non-storm water discharges unless the Regional Board determines that these discharges cause specific receiving water limit violations: [listing certain discharges, including "individual residential car washing" and "discharges or flows from emergency fire fighting activities"]."³⁹⁰ The 2000 Permit carried over the prohibition: "The Co-permittees shall, within their respective jurisdictions, effectively prohibit non-storm water discharges into the MS4 (storm drain systems) and watercourses except where such discharges: 1. Are covered by a separate individual or general NPDES permit; or 2.Not identified as a source of pollutants, subject to conditions: [listing certain discharges, including "individual residential car washing" and "discharges or flows from emergency fire fighting activities"]."³⁹¹ When a discharge is a source of pollutants, federal law requires it to be addressed in a manner similar to other recognized illicit discharges under the federal non-stormwater provisions that have been in place for decades. Implementation of this decades-old standard does not amount to imposition of a new program or any higher level of service than was previously in place. Copermittees are expected to perform the same level of service as in prior permits – effectively prohibit unauthorized non-stormwater discharges. The removal of the exemption for fire fighting vehicles was required to achieve the standard already imposed. Because the state

³⁸⁸ *Department of Finance v. Comm'n on State Mandates*, *supra*, 1 Cal.5th at pp. 771-772.

³⁸⁹ NPDES Permit No. DC0000221, U.S. EPA MS4 Permit issued to the Government of the District of Columbia, Provision 4.3.3., p. 17.

³⁹⁰ 1994 Permit, Part A.1 (AR, p. F003462).

³⁹¹ 2000 Permit, Part 1.A. (AR, pp. F004047-48).

has not imposed a new program or required a higher level of service, the challenged provision is not a state mandate subject to subvention.

This Provision Is Not Unique to Local Government

The non-stormwater discharge prohibition, including the requirement to eliminate discharges of non-residential vehicle wash water, is not unique to the Claimants. The non-stormwater discharge prohibition is a key provision in other permits issued to non-local governmental entities in order to effectively reduce and/or prevent pollutants from reaching waterbodies. For example, industrial and construction stormwater dischargers, as well as the State of California Department of Transportation (Caltrans), are also prohibited from discharging vehicle wash water to the MS4 and/or waterbodies. Relevant permit provisions and findings are as follows.

- NPDES General Permit for Storm Water Discharges Associated with Industrial Activities, Order 2014-0057-DWQ (issued by State Water Board)³⁹²:
 - “Except for non-storm water discharges (NSWDs) authorized in Section IV, discharges of liquids or materials other than storm water, either directly or indirectly to waters of the United States, are prohibited unless authorized by another NPDES permit. Unauthorized NSWDs must be either eliminated or authorized by a separate NPDES permit.”³⁹³
 - No category of vehicle wash water is included as authorized NSWDs in Section IV.³⁹⁴
 - “The Discharger shall: ... Prevent disposal of any rinse/wash waters or industrial materials into the storm water conveyance system.”³⁹⁵
 - “Unauthorized NSWDs can be generated from various pollutant sources. Depending upon their quantity and location where generated, unauthorized NSWDs can discharge to the storm drain system during dry weather as well as during a storm event (comingled with storm water discharge). These NSWDs can consist of, but are not limited to; (1) waters generated by the rinsing or washing of vehicles, equipment, buildings, or pavement, or (2) fluid, particulate or solid materials that have spilled, leaked, or been disposed of improperly.”³⁹⁶
 - The permit’s definition of NSWDs includes “vehicle wash water.”³⁹⁷
- NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (issued by State Water Board)³⁹⁸:

³⁹² NPDES General Permit for Storm Water Discharges Associated with Industrial Activities, Order 2014-0057-DWQ.

³⁹³ *Id.*, Provision III.B, p. 19.

³⁹⁴ *Id.*, Provision IV.A., pp. 19-20.

³⁹⁵ *Id.*, Provision X.H.1.a.vii, p. 30-31.

³⁹⁶ *Id.*, Fact Sheet, pp. 14-15.

³⁹⁷ *Id.*, Attachment C (Glossary), p. 5.

³⁹⁸ NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (as amended by 2010-0014-DWQ and 2012-0006-DWQ).

- “All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.”³⁹⁹
- Dischargers “shall implement measures to control all non-storm water discharges during construction.”⁴⁰⁰
- Dischargers “shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.”⁴⁰¹
- The permit defines non-stormwater discharges as “discharges that do not originate from precipitation events” and “can include, but are not limited to, discharges of ... vehicle wash water.”⁴⁰²
- “Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.”⁴⁰³
- NPDES Statewide Storm Water Permit Waste Discharge Requirements (WDRs) for State of California Department of Transportation, Order 2012-0011-DWQ (as amended) (issued by State Water Board)⁴⁰⁴:
 - The permit’s definition of non-stormwater includes “vehicle wash water.”⁴⁰⁵
 - “Discharge of material other than storm water, or discharge that is not composed entirely of storm water, to waters of the United States or another permitted MS4 is prohibited, except as conditionally exempted under Section B.2 of this Order or authorized by a separate National Pollutant Discharge Elimination System (NPDES) permit.”⁴⁰⁶

³⁹⁹ *Id.*, Provision III.B, p. 20.

⁴⁰⁰ *Id.*, Attachment A (Linear Underground/Overhead Requirements), Provision J.3.a., p. 24; Attachment C (Risk Level 1 Requirements), Provision C.1, p. 4; Attachment D (Risk Level 2 Requirements), Provision C.1., p. 4; Attachment E (Risk Level 3 Requirements), Provision C.1., p. 4.

⁴⁰¹ *Id.*, Attachment A (Linear Underground/Overhead Requirements), Provision J.3.b., p. 24; Attachment C (Risk Level 1 Requirements), Provision C.2, p. 4.; Attachment D (Risk Level 2 Requirements), Provision C.2., p. 4; Attachment E (Risk Level 3 Requirements), Provision C.2., p. 4.

⁴⁰² *Id.*, Appendix 5, p. 7.

⁴⁰³ *Id.*, Fact Sheet, Section J.1.d, p. 30.

⁴⁰⁴ State Water Resources Control Board, Order No. 2012-0011-DWQ (as amended by Orders WQ 2014-0006-EXEC, WQ 2014-0077-DWQ, and WQ 2015-0036-EXEC).

⁴⁰⁵ *Id.*, Attachment VIII, p. 8.

⁴⁰⁶ *Id.*, Provision A.3., p. 15.

- “The Department shall effectively prohibit non-storm water discharges into its storm water conveyance system unless such discharges are either: a. Authorized by a separate NPDES permit; or b. Conditionally exempt in accordance with provision B.2. of this NPDES permit.”⁴⁰⁷
- For vehicle washing, only “individual residential car washing” is conditionally exempted.”⁴⁰⁸

The above clearly demonstrates that Claimants are not being treated any differently than non-local government entities.

For all these reasons, and for the additional reasons discussed in Section V above, the Commission should find that Part 4.G.I.3(a) is not a state mandate subject to subvention.

F. Illicit Connection and Illicit Discharges Elimination Program (Part 4.H.I.3(a)(1)(A))

To implement the requirement to screen for illicit connections, Part 4.H.I.3(a)(1)(A) of the 2010 Permit requires each permittee to submit to the Principal Permittee (the District) a map showing the location and length of underground pipes 18 inches and greater in diameter, and channeled portions of the storm drain system within the permittee’s jurisdiction within a specified timeframe.⁴⁰⁹

Claimants allege this requirement is not mandated by federal law, was not required as part of the 2000 Permit, and constitutes a new program or higher level of service.⁴¹⁰

The Provision is Necessary to Meet Federal Law

Claimants allege that the mapping requirement as part of the Illicit Connection and Illicit Discharges (IC/ID) Elimination Program is not mandated by federal law. Claimants again erroneously assert that the applicable federal standard for non-stormwater discharges is the MEP standard. As explained above, non-stormwater discharges are not subject to the MEP standard applicable to stormwater discharges.⁴¹¹ Rather, this provision is necessary to comply with Clean Water Act section 402(p)(3)(B)(ii), which requires that MS4 permittees to effectively prohibit non-stormwater discharges to the MS4. MS4 permittees are required to effectively prohibit the discharge of unauthorized non-stormwater into the MS4 by implementing a comprehensive, proactive IC/ID elimination program to detect and eliminate illicit discharges and connections to the MS4.⁴¹²

⁴⁰⁷ *Id.*, Provision B.1., p. 16.

⁴⁰⁸ *Id.*, Provision B.2., p. 16.

⁴⁰⁹ 2010 Permit, Part 4.H.I.3(a)(1)(A) (AR, pp. F0001440-41).

⁴¹⁰ Test Claim, p. 35.

⁴¹¹ See State Board Order WQ 2009-0008, p. 4 (withdrawn on other grounds); see also State Water Board Order WQ 2015-0075 (2012 LA County MS4 Permit), pp. 62-63, confirming that non-stormwater discharges to the MS4s under the Clean Water Act are not subject to the MEP standard applicable to stormwater discharges.

⁴¹² 40 C.F.R. § 122.26, subd. (d)(1)(v)(B) and (d)(1)(iv)(B).

The objective of a municipality's IC/ID elimination program is to detect illicit connections and illicit discharges to the MS4 and to promptly remove such discharges and connections.⁴¹³ Federal MS4 permit application requirements specify that MS4 applicants must propose “a program, including a schedule, to detect and remove (or require the discharger to the [MS4] to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.”⁴¹⁴ This proposed program shall include “a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the [MS4]” for “all types of illicit discharges.”⁴¹⁵

The mapping requirement in the 2010 Permit is designed to meet the non-stormwater discharge prohibition. To comply with this federal standard, MS4 permittees must systematically understand and characterize their stream, conveyance, and storm sewer infrastructure systems in order to identify, locate, and eliminate sources of illicit discharges. When sources of pollutants are identified by monitoring results or spill/complaint notifications, a map provides the permittees with the ability to promptly and efficiently identify, locate, and eliminate the sources of pollutants.⁴¹⁶ This knowledge can play a significant role in identifying appropriate actions to prevent non-authorized non-stormwater discharges from entering the MS4.

Federal regulations recognize that accurate mapping is essential to successful implementation of CWA requirements, including IC/ID elimination programs. As part of the initial Phase I MS4 application, federal regulations at 40 C.F.R. § 122.26(d)(1)(iii)(B) required MS4 operators to submit a comprehensive “USGS 7.5 minute topographic map (or equivalent topographic map with a scale between 1:10,000 and 1:24,000 if cost effective) extending one mile beyond the service boundaries of the municipal storm sewer system covered by the permit application.” The following information shall be provided:

- (1) The location of known municipal storm sewer system outfalls discharging to waters of the United States;
- (2) A description of the land use activities (e.g. divisions indicating undeveloped, residential, commercial, agricultural and industrial uses) accompanied with estimates of population densities and projected growth for a ten year period within the drainage area served by the separate storm sewer. For each land use type, an estimate of an average runoff coefficient shall be provided;
- (3) The location and a description of the activities of the facility of each currently operating or closed municipal landfill or other treatment, storage or disposal facility for municipal waste;
- (4) The location and the permit number of any known discharge to the municipal storm sewer that has been issued a NPDES permit;
- (5) The location of major structural controls for storm water discharge (retention basins, detention basins, major infiltration devices, etc.); and
- (6) The identification of publicly owned parks, recreational areas, and other open lands.”

⁴¹³ 2010 Permit, Fact Sheet (AR, p. F003284).

⁴¹⁴ 40 C.F.R. § 122.26(d)(2)(iv)(B).

⁴¹⁵ *Id.* § 122.26(d)(2)(iv)(B)(1).

⁴¹⁶ *Ibid.*

Federal regulations contemplate that MS4 owners and operators will continue to have maps of their MS4, including field screening points, major outfalls and drainage system maps.⁴¹⁷ “Field screening points shall be either major outfalls or other outfall points (or any other point of access such as manholes) randomly located throughout the storm sewer system by placing a grid over a *drainage system map* and identifying those cells of the grid which contain a segment of the storm sewer system or major outfall. The field screening points shall be established using the following guidelines and criteria: 1) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart shall be overlaid on a *map of the municipal storm sewer system*, creating a series of cells;...⁴¹⁸ U.S. EPA regulations for Phase II MS4 permits also require MS4 operators to “[d]evelop, if not already completed a storm sewer system map.”⁴¹⁹

Federal law also specifies that the “Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate.”⁴²⁰ The mapping requirement is a condition imposed on data and information collection, which the Board has determined is necessary to ensure compliance with the regulatory requirements to identify field screening points for assessing illicit connections and discharges, in furtherance of the CWA’s requirement that MS4 permittees effectively prohibit unauthorized non-stormwater discharges.⁴²¹ The Commission should give significant weight to the Los Angeles Water Board’s determination that the challenged provisions are based exclusively on federal law and therefore are federal mandates.

The requirement to have an up-to-date and accurate storm sewer system map is also specifically recommended in U.S. EPA guidance. The U.S. EPA Guidance Manual for Implementing Municipal Storm Water Management Programs - Volume I - Planning and Administration recommended the incorporation of appropriate mapping as follows:

The mapping exercise is carried out as both a desktop operation by using existing information and with field visits to collect further data and to confirm existing information. The maps should provide complete descriptions of the drainage areas, including outfall locations, watershed boundaries for each outfall, critical land use areas (mostly commercial and industrial areas), permitted discharges to the storm drainage system, city limits, major streets, and streams. The user's guide discusses critical land use areas and lists major industries and their potential to be non-storm water entry sources.

The drainage areas are ranked in the order of their potential to cause problems. This allows priorities to be set for field investigation of the outfalls. Note that all outfalls will eventually require investigations, and the mapping stage is important because the entire investigation is based on it.⁴²²

⁴¹⁷ *Id.* § 122.26(d)(1)(iv)(D).

⁴¹⁸ *Id.* § 122.26.(d)(1)(iv)(D)(1) (Emphasis added.)

⁴¹⁹ *Id.* § 122.34(b)(3)(i)-(ii).

⁴²⁰ CWA § 402(a)(2).

⁴²¹ CFR § 122.26(a)(1)(v); see also CWA §402(p)(3)(B)(ii).

⁴²² U.S. EPA, Guidance Manual for Implementing Municipal Storm Water Management Programs - Volume I - Planning and Administration (1991), p. 4-7.

In addition, U.S. EPA's *MS4 Permit Improvement Guide* includes example MS4 permit language requiring a MS4 permittee to maintain an up-to-date and accurate storm sewer system map.⁴²³ U.S. EPA explains:

An effective IDDE [Illicit Discharge Detection Elimination] program is more than just a program to respond to complaints about illicit discharges or spills. Permittees must proactively seek out illicit discharges, or activities that could result in discharges, such as illegal connections to the storm sewer system, improper disposal of wastes, or dumping of used motor oil or other chemicals.

In order to trace the origin of a suspected illicit discharge or connection, the permittee must have an updated map of the storm drain system and a formal plan of how to locate illicit discharges and how to respond to them once they are located or reported. The permittee must provide a mechanism for public reporting of illicit discharges and spills, as well as an effective way for staff to be alerted to such reports. Regular field screening of outfalls for non-stormwater discharges needs to occur in areas determined to have a higher likelihood for illicit discharges and illegal connections. Proper investigation and enforcement procedures must be in place to eliminate the sources of the discharges, as well. Finally, in order for the permittee to adequately detect and eliminate sources of illicit discharges, both field and office staff must be properly trained to recognize and report the discharges to the appropriate parties.⁴²⁴

Consistent with this guidance, the Los Angeles Water Board required permittees to submit a map to the Principal Permittee, in a format the District would find most helpful, which is a more proactive approach to illicit discharge detection and elimination.

Inclusion of similar requirements in U.S. EPA-issued permits likewise supports the Los Angeles Water Board's determination of federal necessity. The Supreme Court in *Department of Finance* observed that U.S. EPA- issued permits do not contain requirements to provide trash receptacles at transit stops (a requirement of the 2001 Los Angeles County MS4 Permit), and found that the absence of such conditions in U.S. EPA-issued permits "undermines the argument that the requirement was federally mandated."⁴²⁵ Here, U.S. EPA's permit issued for Boise/Garden City Area MS4 includes a similar provision requiring mapping of the MS4:

Storm Sewer System Inventory and Mapping. No later than January 30, 2018, the Permittees must update current records to develop a comprehensive inventory and map of the MS4s and associated outfall locations. The inventory must identify all areas over which each Permittee has responsibility. The inventory must include:

- (i) the location of all inlets, catch basins and outfalls owned/operated by the Permittee;
- (ii) *the location of all MS4 collection system pipes (laterals, mains, etc.) owned/operated by the Permittee, including locations where the MS4 is physically interconnected to the MS4 of another operator;*

⁴²³ U.S. EPA, *MS4 Improvement Guide* (Apr. 2010), Chapter 3.2 (AR, p. F004468-69).

⁴²⁴ U.S. EPA, *MS4 Improvement Guide* (Apr. 2010), Chapter 3 (AR, p. F004466).

⁴²⁵ *Department of Finance v. Comm'n on State Mandates*, *supra*, 1 Cal.5th at pp. 771-772.

- (iii) the location of all structural flood control devices, if different from the characteristics listed above;
- (iv) the names and locations of receiving waters of the U.S. that receive discharges from the outfalls;
- (v) the location of all existing structural storm water treatment controls;
- (vi) identification of subwatersheds, associated land uses, and approximate acreage draining into each MS4 outfall; and
- (vii) the location of Permittee-owned vehicle maintenance facilities, material storage facilities, maintenance yards, and snow disposal sites; Permittee-owned or operated parking lots and roadways.⁴²⁶

The fact that the U.S. EPA-issued permit for the Boise/Garden City Area MS4 also imposes comparable requirements independently demonstrates that the Los Angeles Water Board effectively administered federal requirements by including this permit provision and further supports the Board's view that the challenged permit provision is required by federal law.

There is No New Program or Higher Level of Service

While not specifically included in the 2000 Permit, the requirement to have and submit a map of the Permittees' MS4 was an existing requirement when the provision was included in the 2009 Permit. As described above, federal regulations already required MS4 permittees to have a map of their MS4 as part of their initial application, and to maintain maps for field screening. Thus, the requirement in Part 4.H.I.3(a)(1)(A) contemplated that the Permittees would already have this information available to submit to the Principal Permittee. Because the state has not imposed a new program or required a higher level of service, the challenged provision is not a state mandate subject to subvention.

In addition, any associated incremental costs of updating a permittee's MS4 map are *de minimis*. This is because the Permittees would have completed the majority of the work prior to issuance of the 2009 Permit as it was required to do under federal application requirements.

This Provision Is Not Unique to Local Government

The requirement to submit a map of a permittee's facility subject to a NPDES permit is not unique to local government and applies to any person who discharges or proposes to discharge to waters of the U.S. Federal regulations require that all applicants for NPDES permits, whether they are a local government or not, provide certain information to the permitting agency as part of their application, including a map depicting the facility (the MS4) and each of its intake (e.g., catch basins) and discharge structures (e.g., outfalls).⁴²⁷ The fact that a MS4 is much larger than a typical facility is irrelevant.

Industrial and construction dischargers of stormwater, who are also required to prohibit non-stormwater discharges, similarly are required to submit a map as part of their application for a permit. Industrial dischargers are required to submit a "site map showing topography (or indicating

⁴²⁶ U.S. EPA, NPDES Permit No. IDS-027561, *Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit*, issued to Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and the Idaho Transportation Department District #3 (Dec. 12, 2012), at Part II.B.4.a, pp. 20-21 (Emphasis added).

⁴²⁷ 40 C.F.R. § 122.21 subds. (a), (f)(7).

the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) of the facility including: each of its *drainage and discharge structures*; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each past or present area used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas,..."⁴²⁸ Drainage and discharge structures may include underground pipes and channels.

As such, the mapping requirement is a key provision in other permits issued to non-local governmental entities. For example, industrial and construction stormwater dischargers, as well as the State of California Department of Transportation (Caltrans), are also required to map their facilities. The State Water Board's NPDES General Permit for Storm Water Discharges Associated with Industrial Activities, Order 2014-0057-DWQ requires industrial dischargers to prepare a site map as part of their Storm Water Pollution Prevention Plan that includes the following:

- a. The facility boundary, storm water drainage areas within the facility boundary, and portions of any drainage area impacted by discharges from surrounding areas. Include the flow direction of each drainage area, on-facility surface water bodies, areas of soil erosion, and location(s) of nearby water bodies (such as rivers, lakes, wetlands, etc.) *or municipal storm drain inlets that may receive the facility's industrial storm water discharges and authorized NSWDS*;
- b. Locations of *storm water collection and conveyance systems*, associated discharge locations, and direction of flow. Include any sample locations if different than the identified discharge locations;⁴²⁹

The above clearly demonstrates that Claimants are not being treated any differently than non-local government entities.

For all these reasons, and for the additional reasons discussed in Section V above, the Commission should find that Part 4.H.I.3(a)(1)(A) is not a state mandate subject to subvention.

VI. CONCLUSION

The above response establishes that the Test Claim was untimely filed and that the contested provisions are not state mandates because they do not impose new programs or higher levels of service on Claimants. For any challenged provision that the Commission nonetheless finds to be mandated by the state, the Commission should find that the provisions are instead mandated by federal law and/or that other exceptions apply, precluding a finding that subvention is required for any of the Test Claim provisions.

The focus of consideration of the federal mandate exception in *Department of Finance* was the application of the MEP standard to two 2001 LA County MS4 Permit provisions, where the Los Angeles Water Board had not explicitly found that the provisions met that standard.⁴³⁰ In reaching

⁴²⁸ *Id.* § 122.26(c)(1)(i).

⁴²⁹ State Water Board, Order No. 2014-0057-DWQ, NPDES General Permit for Storm Water Discharges Associated with Industrial Activities, Part X.E., at p. 26. (Emphasis added.)

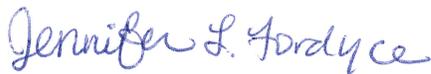
⁴³⁰ *Department of Finance v. Comm'n on State Mandates*, *supra*, 1 Cal.5th at p. 768.

the conclusion that those two provisions did *not* meet MEP, the Court suggested that the result might have been different if the agency *had* found that permit conditions were necessary to satisfy the MEP standard, and specifically noted that deference to the agency would be appropriate.⁴³¹ Here, the Los Angeles Water Board *did* find that the permit conditions of the MS4 Permit were necessary to satisfy the MEP standard and that the permit was based entirely on federal law. Those findings are entitled to deference.

Even if the Commission does not defer to the Los Angeles Water Board's findings, analogous provisions in U.S. EPA-issued permits or U.S. EPA permit guidance and model permit language independently demonstrate that the Permit's provisions were federally mandated.⁴³² In addition, the Permit's provisions implement other federal standards, discussed above, that the Supreme Court did not evaluate. Furthermore, the Supreme Court's decision did not address a number of the other exceptions to mandates law present here, such as the existence of fee authority, the absence of a new program or higher level of service, the opportunity for Permittees to propose and substitute other programs and/or BMPs for many of the requirements in the 2010 Permit, and the absence of requirements "unique" to local governments and situations where costs are *de minimis*.

For these reasons, the Commission should find that the 2010 Permit does not impose state mandates requiring subvention and the Commission should deny the Test Claim in its entirety.

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing facts are true and correct to the best of my personal knowledge or information or belief. I further declare that all documents attached are true and correct copies of such documents as they exist in the Los Angeles Water Board's files, or were obtained from publicly available sources.



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Attachments

cc: Service List via CSM Dropbox

⁴³¹ *Ibid.*

⁴³² *Id.*, at p. 772.

ATTACHMENTS TO WATER BOARDS' COMMENTS ON TEST CLAIM 11-TC-01

Attachment No.	Document
<i>Federal Statutes and Regulations</i>	
1	Clean Water Act § 301 (33 U.S.C. § 1311)
2	Clean Water Act § 502 (33 U.S.C. § 1362)
3	Clean Water Act § 308 (33 U.S.C. § 1318)
4	40 C.F.R. § 122.21
5	40 C.F.R. § 122.34
6	40 C.F.R. § 122.41
7	64 Fed. Reg. 68722 (Dec. 8, 1999)
8	81 Fed. Reg. 89320 (Dec. 9, 2016)
<i>State Constitutional Provisions, Statutes, and Regulations</i>	
9	Cal. Const., art XIII C, § 1
10	Government Code § 17551
11	Government Code § 17553
12	Water Code § 13320
13	Water Code § 13370
14	Water Code § 13372
15	Ventura County Watershed Protection Act, California Water Code Appendix, Chapter 46
16	Senate Bill 231 (Stats. 2017, ch. 536)
17	Cal. Code Regs., tit. 23, § 2235.2
18	Cal. Code Regs., tit. 23, § 2235.3
<i>Federal Cases</i>	
19	<i>Natural Resources Defense Council v. Costle</i> (1977) 568 F.2d 1369
20	<i>NRDC v. U.S. EPA</i> (9th Cir. 1992) 966 F.2d 1292
21	<i>Defenders of Wildlife v. Browner</i> (1999) 191 F.3d 1159
22	<i>Environmental Defense Center, Inc. v. EPA</i> (9th Cir. 2003) 344 F.3d 832
<i>State Cases</i>	
23	<i>City of San Jose v. State of California</i> (1996) 45 Cal.App.4th 1802
24	<i>Connell v. Sup. Ct.</i> (1997) 59 Cal.App.4th 382
25	<i>Redevelopment Agency v. Commission on State Mandates</i> (1997) 55 Cal.App.4th 976
26	<i>City of Richmond v. Commission on State Mandates</i> (1998) 64 Cal.App.4th 1190
27	<i>County of Sonoma v. Comm'n on State Mandates</i> (2000) 84 Cal.App.4th 1264
28	<i>City of Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region</i> (2002) 135 Cal.App.4th 1377
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30	<i>County of Los Angeles v. Comm'n on State Mandates</i> (2003) 110 Cal.App.4th 1176
31	<i>Clovis Unified School Dist. v. Chiang</i> (2010) 188 Cal.App.4th 794
<i>State Administrative Decisions</i>	
32	State Water Resources Control Board Order WQ 99-05
33	State Water Resources Control Board Order WQ 2009-0008
34	State Water Resources Control Board Order WQ 2015-0075

<i>State Policies and Permits</i>	
35	Los Angeles Water Board, Water Quality Control Plan for the Los Angeles Region (Basin Plan), Chapter 3
36	State Water Resources Control Board, Order No. 2014-0057-DWQ, NPDES General Permit for Storm Water Discharges Associated with Industrial Activities
37	State Water Resources Control Board, Order No. 2009-0009-DWQ (as amended by 2010-0014-DWQ and 2012-0006-DWQ), NPDES General Permit for Storm Water Discharges Associated With Construction And Land Disturbance Activities
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<i>U.S. EPA Issued MS4 Permits and Guidance</i>	
39	U.S. EPA, NPDES Permit No. DC0000221, <i>Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit</i> , issued to the District of Columbia (Oct. 7, 2011)
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41	U.S. EPA, NPDES Permit No. NMR04A000, <i>Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit</i> , issued to the Middle Rio Grande Watershed (Dec. 22, 2014)
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44	U.S. EPA, Developing an Outreach Strategy Minimum Measure: Public Education and Outreach on Stormwater Impacts, Classroom Education on Stormwater
45	U.S. EPA, Developing an Outreach Strategy Minimum Measure: Public Education and Outreach on Stormwater Impacts, Stormwater Outreach for Commercial Businesses
46	U.S. EPA, Stormwater Outreach for Commercial Businesses Minimum Measure: Public Education and Outreach on Stormwater Impacts, Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children

47	U.S. EPA, Stormwater Menu of BMPs for the Minimum Measure: Pollution Prevention/Good Housekeeping for Municipal Operations: Municipal Vehicle and Equipment Washing
48	U.S. EPA, Stormwater Phase II Final Rule Fact Sheet: <i>Public Education and Outreach Minimum Control Measure</i> (Dec. 2005)
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<i>Miscellaneous Materials</i>	
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60	CASQA, Assessing the Effectiveness of Your Municipal Stormwater Program (2007)
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<i>Funding/Fees</i>	
67	2005 Stormwater Utility Report, Black and Veatch
68	Ventura County Watershed Protection District, Report on Benefit Assessment Program for Watershed Protection: Fiscal Year 2010/2011
69	City of San Clemente Urban Runoff Management Fee/Clean Ocean Program (2013)
70	City of Santa Cruz, Measure E: Clean River, Beaches and Ocean Fund (Fiscal Year 2015)
71	City of Palo Alto Storm Drainage Fee/San Jose Mercury News Article (August 30, 2016)
72	City of San Jose Storm Sewer Charge (web page listing, February 14, 2017 web access date)
73	City of Alameda Sewer and Storm Water Fees Bulletin (September 22, 2017, web access date)
74	Culver City Measure CW, The Clean Water, Clean Beach Parcel Tax (October 25, 2017, web access date)

ATTACHMENT 1

United States Code Annotated

Title 33. Navigation and Navigable Waters (Refs & Annos)

Chapter 26. Water Pollution Prevention and Control (Refs & Annos)

Subchapter III. Standards and Enforcement (Refs & Annos)

33 U.S.C.A. § 1311

§ 1311. Effluent limitations

Currentness

(a) Illegality of pollutant discharges except in compliance with law

Except as in compliance with this section and [sections 1312, 1316, 1317, 1328, 1342, and 1344](#) of this title, the discharge of any pollutant by any person shall be unlawful.

(b) Timetable for achievement of objectives

In order to carry out the objective of this chapter there shall be achieved--

(1)(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently available as defined by the Administrator pursuant to [section 1314\(b\)](#) of this title, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under [section 1317](#) of this title; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to [section 1283](#) of this title prior to June 30, 1974 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to [section 1314\(d\)\(1\)](#) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by [section 1370](#) of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

(2)(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to [section 1314\(b\)\(2\)](#) of this title, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to [section 1325](#) of this title), that such elimination is technologically and economically achievable for a category or class of point sources as determined in accordance with regulations issued by the Administrator pursuant to [section 1314\(b\)\(2\)](#) of this title, or (ii) in the case of the introduction of a

pollutant into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment requirements and any other requirement under [section 1317](#) of this title;

(B) Repealed. [Pub.L. 97-117, § 21\(b\)](#), Dec. 29, 1981, 95 Stat. 1632.

(C) with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95-30 of the Committee on Public Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under [section 1314\(b\)](#) of this title, and in no case later than March 31, 1989;

(D) for all toxic pollutants listed under [paragraph \(1\) of subsection \(a\) of section 1317](#) of this title which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under [section 1314\(b\)](#) of this title, and in no case later than March 31, 1989;

(E) as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under [section 1314\(b\)](#) of this title, and in no case later than March 31, 1989, compliance with effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which in the case of pollutants identified pursuant to [section 1314\(a\)\(4\)](#) of this title shall require application of the best conventional pollutant control technology as determined in accordance with regulations issued by the Administrator pursuant to [section 1314\(b\)\(4\)](#) of this title; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than 3 years after the date such limitations are established, and in no case later than March 31, 1989.

(3)(A) for effluent limitations under paragraph (1)(A)(i) of this subsection promulgated after January 1, 1982, and requiring a level of control substantially greater or based on fundamentally different control technology than under permits for an industrial category issued before such date, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under [section 1314\(b\)](#) of this title, and in no case later than March 31, 1989; and

(B) for any effluent limitation in accordance with paragraph (1)(A)(i), (2)(A)(i), or (2)(E) of this subsection established only on the basis of [section 1342\(a\)\(1\)](#) of this title in a permit issued after February 4, 1987, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are established, and in no case later than March 31, 1989.

(c) Modification of timetable

The Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will represent the maximum use of technology

within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

(d) Review and revision of effluent limitations

Any effluent limitation required by paragraph (2) of subsection (b) of this section shall be reviewed at least every five years and, if appropriate, revised pursuant to the procedure established under such paragraph.

(e) All point discharge source application of effluent limitations

Effluent limitations established pursuant to this section or [section 1312](#) of this title shall be applied to all point sources of discharge of pollutants in accordance with the provisions of this chapter.

(f) Illegality of discharge of radiological, chemical, or biological warfare agents, high-level radioactive waste, or medical waste

Notwithstanding any other provisions of this chapter it shall be unlawful to discharge any radiological, chemical, or biological warfare agent, any high-level radioactive waste, or any medical waste, into the navigable waters.

(g) Modifications for certain nonconventional pollutants

(1) General authority

The Administrator, with the concurrence of the State, may modify the requirements of subsection (b)(2)(A) of this section with respect to the discharge from any point source of ammonia, chlorine, color, iron, and total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by subsection (b)(2)(F)) and any other pollutant which the Administrator lists under paragraph (4) of this subsection.

(2) Requirements for granting modifications

A modification under this subsection shall be granted only upon a showing by the owner or operator of a point source satisfactory to the Administrator that--

(A) such modified requirements will result at a minimum in compliance with the requirements of subsection (b)(1)(A) or (C) of this section, whichever is applicable;

(B) such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(C) such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human

health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

(3) Limitation on authority to apply for subsection (c) modification

If an owner or operator of a point source applies for a modification under this subsection with respect to the discharge of any pollutant, such owner or operator shall be eligible to apply for modification under subsection (c) of this section with respect to such pollutant only during the same time period as he is eligible to apply for a modification under this subsection.

(4) Procedures for listing additional pollutants

(A) General authority

Upon petition of any person, the Administrator may add any pollutant to the list of pollutants for which modification under this section is authorized (except for pollutants identified pursuant to [section 1314\(a\)\(4\)](#) of this title, toxic pollutants subject to [section 1317\(a\)](#) of this title, and the thermal component of discharges) in accordance with the provisions of this paragraph.

(B) Requirements for listing

(i) Sufficient information

The person petitioning for listing of an additional pollutant under this subsection shall submit to the Administrator sufficient information to make the determinations required by this subparagraph.

(ii) Toxic criteria determination

The Administrator shall determine whether or not the pollutant meets the criteria for listing as a toxic pollutant under [section 1317\(a\)](#) of this title.

(iii) Listing as toxic pollutant

If the Administrator determines that the pollutant meets the criteria for listing as a toxic pollutant under [section 1317\(a\)](#) of this title, the Administrator shall list the pollutant as a toxic pollutant under [section 1317\(a\)](#) of this title.

(iv) Nonconventional criteria determination

If the Administrator determines that the pollutant does not meet the criteria for listing as a toxic pollutant under such section and determines that adequate test methods and sufficient data are available to make the determinations required by paragraph (2) of this subsection with respect to the pollutant, the Administrator shall add the pollutant to the list of pollutants specified in paragraph (1) of this subsection for which modifications are authorized under this subsection.

(C) Requirements for filing of petitions

A petition for listing of a pollutant under this paragraph--

(i) must be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under [section 1314](#) of this title;

(ii) may be filed before promulgation of such guideline; and

(iii) may be filed with an application for a modification under paragraph (1) with respect to the discharge of such pollutant.

(D) Deadline for approval of petition

A decision to add a pollutant to the list of pollutants for which modifications under this subsection are authorized must be made within 270 days after the date of promulgation of an applicable effluent guideline under [section 1314](#) of this title.

(E) Burden of proof

The burden of proof for making the determinations under subparagraph (B) shall be on the petitioner.

(5) Removal of pollutants

The Administrator may remove any pollutant from the list of pollutants for which modifications are authorized under this subsection if the Administrator determines that adequate test methods and sufficient data are no longer available for determining whether or not modifications may be granted with respect to such pollutant under paragraph (2) of this subsection.

(h) Modification of secondary treatment requirements

The Administrator, with the concurrence of the State, may issue a permit under [section 1342](#) of this title which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that--

(1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under [section 1314\(a\)\(6\)](#) of this title;

(2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which

assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities, in and on the water;

(3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of such monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;

(4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;

(6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant will enforce such requirements, and the applicant has in effect a pretreatment program which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;

(7) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;

(8) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

(9) the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under [section 1314\(a\)\(1\)](#) of this title after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.

For the purposes of this subsection the phrase “the discharge of any pollutant into marine waters” refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and [section 1251\(a\)\(2\)](#) of this title. For the purposes of paragraph (9), “primary or equivalent treatment” means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which applies secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued under this subsection for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previously discharged effluent from such treatment works. No permit issued under this subsection shall authorize the discharge of any pollutant into saline estuarine waters which at the time of application do not support a balanced indigenous population of shellfish, fish and wildlife, or allow recreation in and on the waters or which exhibit ambient

water quality below applicable water quality standards adopted for the protection of public water supplies, shellfish, fish and wildlife or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant's current or proposed discharge. Notwithstanding any other provisions of this subsection, no permit may be issued under this subsection for discharge of a pollutant into the New York Bight Apex consisting of the ocean waters of the Atlantic Ocean westward of 73 degrees 30 minutes west longitude and northward of 40 degrees 10 minutes north latitude.

(i) Municipal time extensions

(1) Where construction is required in order for a planned or existing publicly owned treatment works to achieve limitations under subsection (b)(1)(B) or (b)(1)(C) of this section, but (A) construction cannot be completed within the time required in such subsection, or (B) the United States has failed to make financial assistance under this chapter available in time to achieve such limitations by the time specified in such subsection, the owner or operator of such treatment works may request the Administrator (or if appropriate the State) to issue a permit pursuant to [section 1342](#) of this title or to modify a permit issued pursuant to that section to extend such time for compliance. Any such request shall be filed with the Administrator (or if appropriate the State) within 180 days after February 4, 1987. The Administrator (or if appropriate the State) may grant such request and issue or modify such a permit, which shall contain a schedule of compliance for the publicly owned treatment works based on the earliest date by which such financial assistance will be available from the United States and construction can be completed, but in no event later than July 1, 1988, and shall contain such other terms and conditions, including those necessary to carry out [subsections \(b\) through \(g\) of section 1281](#) of this title, [section 1317](#) of this title, and such interim effluent limitations applicable to that treatment works as the Administrator determines are necessary to carry out the provisions of this chapter.

(2)(A) Where a point source (other than a publicly owned treatment works) will not achieve the requirements of subsections (b)(1)(A) and (b)(1)(C) of this section and--

(i) if a permit issued prior to July 1, 1977, to such point source is based upon a discharge into a publicly owned treatment works; or

(ii) if such point source (other than a publicly owned treatment works) had before July 1, 1977, a contract (enforceable against such point source) to discharge into a publicly owned treatment works; or

(iii) if either an application made before July 1, 1977, for a construction grant under this chapter for a publicly owned treatment works, or engineering or architectural plans or working drawings made before July 1, 1977, for a publicly owned treatment works, show that such point source was to discharge into such publicly owned treatment works,

and such publicly owned treatment works is presently unable to accept such discharge without construction, and in the case of a discharge to an existing publicly owned treatment works, such treatment works has an extension pursuant to paragraph (1) of this subsection, the owner or operator of such point source may request the Administrator (or if appropriate the State) to issue or modify such a permit pursuant to such [section 1342](#) of this title to extend such time for compliance. Any such request shall be filed with the Administrator (or if appropriate the State) within 180 days after December 27, 1977, or the filing of a request by the appropriate publicly owned treatment works under paragraph (1) of this subsection, whichever is later. If the Administrator (or if appropriate the State) finds that the owner or operator of such point source has acted in good faith, he may grant such request and issue or modify such a permit, which shall

contain a schedule of compliance for the point source to achieve the requirements of subsections (b)(1)(A) and (C) of this section and shall contain such other terms and conditions, including pretreatment and interim effluent limitations and water conservation requirements applicable to that point source, as the Administrator determines are necessary to carry out the provisions of this chapter.

(B) No time modification granted by the Administrator (or if appropriate the State) pursuant to paragraph (2)(A) of this subsection shall extend beyond the earliest date practicable for compliance or beyond the date of any extension granted to the appropriate publicly owned treatment works pursuant to paragraph (1) of this subsection, but in no event shall it extend beyond July 1, 1988; and no such time modification shall be granted unless (i) the publicly owned treatment works will be in operation and available to the point source before July 1, 1988, and will meet the requirements of subsections (b)(1)(B) and (C) of this section after receiving the discharge from that point source; and (ii) the point source and the publicly owned treatment works have entered into an enforceable contract requiring the point source to discharge into the publicly owned treatment works, the owner or operator of such point source to pay the costs required under [section 1284](#) of this title, and the publicly owned treatment works to accept the discharge from the point source; and (iii) the permit for such point source requires that point source to meet all requirements under [section 1317\(a\)](#) and [\(b\)](#) of this title during the period of such time modification.

(j) Modification procedures

(1) Any application filed under this section for a modification of the provisions of--

(A) subsection (b)(1)(B) under subsection (h) of this section shall be filed not later than ¹ the 365th day which begins after December 29, 1981, except that a publicly owned treatment works which prior to December 31, 1982, had a contractual arrangement to use a portion of the capacity of an ocean outfall operated by another publicly owned treatment works which has applied for or received modification under subsection (h), may apply for a modification of subsection (h) in its own right not later than 30 days after February 4, 1987, and except as provided in paragraph (5);

(B) subsection (b)(2)(A) as it applies to pollutants identified in subsection (b)(2)(F) shall be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under [section 1314](#) of this title or not later than 270 days after December 27, 1977, whichever is later.

(2) Subject to paragraph (3) of this section, any application for a modification filed under subsection (g) of this section shall not operate to stay any requirement under this chapter, unless in the judgment of the Administrator such a stay or the modification sought will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity, or teratogenicity), or synergistic propensities, and that there is a substantial likelihood that the applicant will succeed on the merits of such application. In the case of an application filed under subsection (g) of this section, the Administrator may condition any stay granted under this paragraph on requiring the filing of a bond or other appropriate security to assure timely compliance with the requirements from which a modification is sought.

(3) Compliance requirements under subsection (g)

(A) Effect of filing

An application for a modification under subsection (g) and a petition for listing of a pollutant as a pollutant for which modifications are authorized under such subsection shall not stay the requirement that the person seeking such modification or listing comply with effluent limitations under this chapter for all pollutants not the subject of such application or petition.

(B) Effect of disapproval

Disapproval of an application for a modification under subsection (g) shall not stay the requirement that the person seeking such modification comply with all applicable effluent limitations under this chapter.

(4) Deadline for subsection (g) decision

An application for a modification with respect to a pollutant filed under subsection (g) must be approved or disapproved not later than 365 days after the date of such filing; except that in any case in which a petition for listing such pollutant as a pollutant for which modifications are authorized under such subsection is approved, such application must be approved or disapproved not later than 365 days after the date of approval of such petition.

(5) Extension of application deadline

(A) In general

In the 180-day period beginning on October 31, 1994, the city of San Diego, California, may apply for a modification pursuant to subsection (h) of the requirements of subsection (b)(1)(B) with respect to biological oxygen demand and total suspended solids in the effluent discharged into marine waters.

(B) Application

An application under this paragraph shall include a commitment by the applicant to implement a waste water reclamation program that, at a minimum, will--

(i) achieve a system capacity of 45,000,000 gallons of reclaimed waste water per day by January 1, 2010; and

(ii) result in a reduction in the quantity of suspended solids discharged by the applicant into the marine environment during the period of the modification.

(C) Additional conditions

The Administrator may not grant a modification pursuant to an application submitted under this paragraph unless the Administrator determines that such modification will result in removal of not less than 58 percent of the biological oxygen demand (on an annual average) and not less than 80 percent of total suspended solids (on a monthly average) in the discharge to which the application applies.

(D) Preliminary decision deadline

The Administrator shall announce a preliminary decision on an application submitted under this paragraph not later than 1 year after the date the application is submitted.

(k) Innovative technology

In the case of any facility subject to a permit under [section 1342](#) of this title which proposes to comply with the requirements of subsection (b)(2)(A) or (b)(2)(E) of this section by replacing existing production capacity with an innovative production process which will result in an effluent reduction significantly greater than that required by the limitation otherwise applicable to such facility and moves toward the national goal of eliminating the discharge of all pollutants, or with the installation of an innovative control technique that has a substantial likelihood for enabling the facility to comply with the applicable effluent limitation by achieving a significantly greater effluent reduction than that required by the applicable effluent limitation and moves toward the national goal of eliminating the discharge of all pollutants, or by achieving the required reduction with an innovative system that has the potential for significantly lower costs than the systems which have been determined by the Administrator to be economically achievable, the Administrator (or the State with an approved program under [section 1342](#) of this title, in consultation with the Administrator) may establish a date for compliance under subsection (b)(2)(A) or (b)(2)(E) of this section no later than two years after the date for compliance with such effluent limitation which would otherwise be applicable under such subsection, if it is also determined that such innovative system has the potential for industrywide application.

(l) Toxic pollutants

Other than as provided in subsection (n) of this section, the Administrator may not modify any requirement of this section as it applies to any specific pollutant which is on the toxic pollutant list under [section 1317\(a\)\(1\)](#) of this title.

(m) Modification of effluent limitation requirements for point sources

(1) The Administrator, with the concurrence of the State, may issue a permit under [section 1342](#) of this title which modifies the requirements of subsections (b)(1)(A) and (b)(2)(E) of this section, and of [section 1343](#) of this title, with respect to effluent limitations to the extent such limitations relate to biochemical oxygen demand and pH from discharges by an industrial discharger in such State into deep waters of the territorial seas, if the applicant demonstrates and the Administrator finds that--

(A) the facility for which modification is sought is covered at the time of the enactment of this subsection by National Pollutant Discharge Elimination System permit number CA0005894 or CA0005282;

(B) the energy and environmental costs of meeting such requirements of subsections (b)(1)(A) and (b)(2)(E) and [section 1343](#) of this title exceed by an unreasonable amount the benefits to be obtained, including the objectives of this chapter;

(C) the applicant has established a system for monitoring the impact of such discharges on a representative sample of aquatic biota;

- (D) such modified requirements will not result in any additional requirements on any other point or nonpoint source;
- (E) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;
- (F) the discharge is into waters where there is strong tidal movement and other hydrological and geological characteristics which are necessary to allow compliance with this subsection and [section 1251\(a\)\(2\)](#) of this title;
- (G) the applicant accepts as a condition to the permit a contractual² obligation to use funds in the amount required (but not less than \$250,000 per year for ten years) for research and development of water pollution control technology, including but not limited to closed cycle technology;
- (H) the facts and circumstances present a unique situation which, if relief is granted, will not establish a precedent or the relaxation of the requirements of this chapter applicable to similarly situated discharges; and
- (I) no owner or operator of a facility comparable to that of the applicant situated in the United States has demonstrated that it would be put at a competitive disadvantage to the applicant (or the parent company or any subsidiary thereof) as a result of the issuance of a permit under this subsection.

(2) The effluent limitations established under a permit issued under paragraph (1) shall be sufficient to implement the applicable State water quality standards, to assure the protection of public water supplies and protection and propagation of a balanced, indigenous population of shellfish, fish, fauna, wildlife, and other aquatic organisms, and to allow recreational activities in and on the water. In setting such limitations, the Administrator shall take into account any seasonal variations and the need for an adequate margin of safety, considering the lack of essential knowledge concerning the relationship between effluent limitations and water quality and the lack of essential knowledge of the effects of discharges on beneficial uses of the receiving waters.

(3) A permit under this subsection may be issued for a period not to exceed five years, and such a permit may be renewed for one additional period not to exceed five years upon a demonstration by the applicant and a finding by the Administrator at the time of application for any such renewal that the provisions of this subsection are met.

(4) The Administrator may terminate a permit issued under this subsection if the Administrator determines that there has been a decline in ambient water quality of the receiving waters during the period of the permit even if a direct cause and effect relationship cannot be shown: *Provided*, That if the effluent from a source with a permit issued under this subsection is contributing to a decline in ambient water quality of the receiving waters, the Administrator shall terminate such permit.

(n) Fundamentally different factors

(1) General rule

The Administrator, with the concurrence of the State, may establish an alternative requirement under subsection (b) (2) or [section 1317\(b\)](#) of this title for a facility that modifies the requirements of national effluent limitation guidelines or categorical pretreatment standards that would otherwise be applicable to such facility, if the owner or operator of such facility demonstrates to the satisfaction of the Administrator that--

(A) the facility is fundamentally different with respect to the factors (other than cost) specified in [section 1314\(b\)](#) or [1314\(g\)](#) of this title and considered by the Administrator in establishing such national effluent limitation guidelines or categorical pretreatment standards;

(B) the application--

(i) is based solely on information and supporting data submitted to the Administrator during the rulemaking for establishment of the applicable national effluent limitation guidelines or categorical pretreatment standard specifically raising the factors that are fundamentally different for such facility; or

(ii) is based on information and supporting data referred to in clause (i) and information and supporting data the applicant did not have a reasonable opportunity to submit during such rulemaking;

(C) the alternative requirement is no less stringent than justified by the fundamental difference; and

(D) the alternative requirement will not result in a non-water quality environmental impact which is markedly more adverse than the impact considered by the Administrator in establishing such national effluent limitation guideline or categorical pretreatment standard.

(2) Time limit for applications

An application for an alternative requirement which modifies the requirements of an effluent limitation or pretreatment standard under this subsection must be submitted to the Administrator within 180 days after the date on which such limitation or standard is established or revised, as the case may be.

(3) Time limit for decision

The Administrator shall approve or deny by final agency action an application submitted under this subsection within 180 days after the date such application is filed with the Administrator.

(4) Submission of information

The Administrator may allow an applicant under this subsection to submit information and supporting data until the earlier of the date the application is approved or denied or the last day that the Administrator has to approve or deny such application.

(5) Treatment of pending applications

For the purposes of this subsection, an application for an alternative requirement based on fundamentally different factors which is pending on February 4, 1987, shall be treated as having been submitted to the Administrator on the 180th day following February 4, 1987. The applicant may amend the application to take into account the provisions of this subsection.

(6) Effect of submission of application

An application for an alternative requirement under this subsection shall not stay the applicant's obligation to comply with the effluent limitation guideline or categorical pretreatment standard which is the subject of the application.

(7) Effect of denial

If an application for an alternative requirement which modifies the requirements of an effluent limitation or pretreatment standard under this subsection is denied by the Administrator, the applicant must comply with such limitation or standard as established or revised, as the case may be.

(8) Reports

By January 1, 1997, and January 1 of every odd-numbered year thereafter, the Administrator shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report on the status of applications for alternative requirements which modify the requirements of effluent limitations under section 1311 or 1314 of this title or any national categorical pretreatment standard under [section 1317\(b\)](#) of this title filed before, on, or after February 4, 1987.

(o) Application fees

The Administrator shall prescribe and collect from each applicant fees reflecting the reasonable administrative costs incurred in reviewing and processing applications for modifications submitted to the Administrator pursuant to subsections (c), (g), (i), (k), (m), and (n) of this section, [section 1314\(d\)\(4\)](#) of this title, and [section 1326\(a\)](#) of this title. All amounts collected by the Administrator under this subsection shall be deposited into a special fund of the Treasury entitled "Water Permits and Related Services" which shall thereafter be available for appropriation to carry out activities of the Environmental Protection Agency for which such fees were collected.

(p) Modified permit for coal remining operations

(1) In general

Subject to paragraphs (2) through (4) of this subsection, the Administrator, or the State in any case which the State has an approved permit program under [section 1342\(b\)](#) of this title, may issue a permit under [section 1342](#) of this title which modifies the requirements of subsection (b)(2)(A) of this section with respect to the pH level of any pre-existing discharge, and with respect to pre-existing discharges of iron and manganese from the remined area of any coal remining operation or with respect to the pH level or level of iron or manganese in any pre-existing discharge

affected by the remining operation. Such modified requirements shall apply the best available technology economically achievable on a case-by-case basis, using best professional judgment, to set specific numerical effluent limitations in each permit.

(2) Limitations

The Administrator or the State may only issue a permit pursuant to paragraph (1) if the applicant demonstrates to the satisfaction of the Administrator or the State, as the case may be, that the coal remining operation will result in the potential for improved water quality from the remining operation but in no event shall such a permit allow the pH level of any discharge, and in no event shall such a permit allow the discharges of iron and manganese, to exceed the levels being discharged from the remined area before the coal remining operation begins. No discharge from, or affected by, the remining operation shall exceed State water quality standards established under [section 1313](#) of this title.

(3) Definitions

For purposes of this subsection--

(A) Coal remining operation

The term “coal remining operation” means a coal mining operation which begins after February 4, 1987 at a site on which coal mining was conducted before August 3, 1977.

(B) Remined area

The term “remined area” means only that area of any coal remining operation on which coal mining was conducted before August 3, 1977.

(C) Pre-existing discharge

The term “pre-existing discharge” means any discharge at the time of permit application under this subsection.

(4) Applicability of strip mining laws

Nothing in this subsection shall affect the application of the Surface Mining Control and Reclamation Act of 1977 [[30 U.S.C.A. § 1201 et seq.](#)] to any coal remining operation, including the application of such Act to suspended solids.

CREDIT(S)

(June 30, 1948, c. 758, Title III, [§ 301](#), as added Pub.L. 92-500, § 2, Oct. 18, 1972, 86 Stat. 844; amended [Pub.L. 95-217](#), §§ 42-47, 53(c), Dec. 27, 1977, 91 Stat. 1582-1586, 1590; [Pub.L. 97-117](#), §§ 21, 22(a)-(d), Dec. 29, 1981, 95 Stat. 1631, 1632; [Pub.L. 97-440](#), Jan. 8, 1983, 96 Stat. 2289; [Pub.L. 100-4](#), Title III, §§ [301\(a\)](#) to (e), 302(a) to (d), 303(a), (b)(1), (c) to (f), 304(a), 305, 306(a), (b), 307, Feb. 4, 1987, 101 Stat. 29-37; [Pub.L. 100-688](#), Title III, § [3202\(b\)](#), Nov. 18, 1988, 102 Stat. 4154; [Pub.L. 103-431](#), § 2, Oct. 31, 1994, 108 Stat. 4396; [Pub.L. 104-66](#), Title II, § [2021\(b\)](#), Dec. 21, 1995, 109 Stat. 727.)

Relevant Additional Resources

Additional Resources listed below contain your search terms.

HISTORICAL AND STATUTORY NOTES

Amendments

1987 Amendments. Subsec. (b)(2)(C). [Pub.L. 100-4, § 301\(a\)](#), struck out “not later than July 1, 1984,” preceding “with respect” and inserted “as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989” after “of this paragraph”.

Subsec. (b)(2)(D). [Pub.L. 100-4, § 301\(b\)](#), substituted “as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989” for “not later than three years after the date such limitations are established”.

Subsec. (b)(2)(E). [Pub.L. 100-4, § 301\(c\)](#), substituted “as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989, compliance with” for “not later than July 1, 1984,”.

Subsec. (b)(2)(F). [Pub.L. 100-4, § 301\(d\)](#), substituted “as expeditiously as practicable but in no case” for “not” and “and in no case later than March 31, 1989” for “or not later than July 1, 1984, whichever is later, but in no case later than July 1, 1987”.

Subsec. (b)(3). [Pub.L. 100-4, § 301\(e\)](#), added par. (3).

Effective and Applicability Provisions

“(1) General Rule.--Except as provided in paragraph (2), the amendments made by this section [amending subsecs. (g) and (j) of this section] shall apply to all requests for modifications under [section 301\(g\)](#) of the Federal Water Pollution Control Act [subsec. (g) of this section] pending on the date of the enactment of this Act [Feb. 4, 1987] and shall not have the effect of extending the deadline established in [section 301\(j\)\(1\)\(B\)](#) of such Act [subsec. (j)(1)(B) of this section].

“(2) Exception.--The amendments made by this section [amending subsecs. (g) and (j) of this section] shall not affect any application for a modification with respect to the discharge of ammonia, chlorine, color, iron, or total phenols (4AAP) under [section 301\(g\)](#) of the Federal Water Pollution Control Act [subsec. (g) of this section] pending on the date of the enactment of this Act [Feb. 4, 1987]; except that the Administrator must approve or disapprove such application not later than 365 days after the date of such enactment [Feb. 4, 1987].”

Section 303(g) of [Pub.L. 100-4](#) provided that: “The amendments made by subsections (a) [amending subsec. (h)(2) of this section], (c) [enacting subsec. (h)(6) of this section and redesignating former subsec. (h)(6) and (7) as (h)(7) and (8)], (d) [enacting subsec. (h)(9) of this section and inserting provision defining primary and equivalent treatment in provision following subsec. (h)(9)], and (e) [inserting provision relating to issuance of permit to discharge pollutants into marine waters in provision following subsec. (h)(9)] of this section shall not apply to an application for a permit under [section 301\(h\)](#) of the Federal Water Pollution Control Act [subsec. (h) of this title] which has been tentatively or finally approved by the Administrator before the date of the enactment of this Act [Feb. 4, 1987]; except that such amendments shall apply to all renewals of such permits after such date of enactment.”

1981 Acts. Section 22(e) of [Pub.L. 97-117](#) provided that: “The amendments made by this section [amending subsecs. (h) and (j)(1)(A) of this section] shall take effect on the date of enactment of this Act [Dec. 29, 1981], except that no applicant, other than the city of Avalon, California, who applies after the date of enactment of this Act for a permit pursuant to subsection (h) of [section 301](#) of the Federal Water Pollution Control Act [subsec. (h) of this section] which modifies the requirements of subsection (b)(1)(B) of [section 301](#) of such Act [subsec. (b)(1)(B) of this section] shall receive such permit during the one-year period which begins on the date of enactment of this Act.”

Deadlines for Regulations for Certain Toxic Pollutants

[Section 301](#)(f) of [Pub.L. 100-4](#) provided that: “The Administrator shall promulgate final regulations establishing effluent limitations in accordance with [sections 301](#)(b)(2)(A) and 307(b)(1) of the Federal Water Pollution Control Act [subsec. (b)(2)(A) of this section and section 1317(b)(1) of this title] for all toxic pollutants referred to in table 1 of Committee Print Numbered 95-30 of the Committee on Public Works and Transportation of the House of Representatives which are discharged from the categories of point sources in accordance with the following table:

Discharges From Point Sources in United States Virgin Islands Attributable to Manufacture of Rum; Exemption From Federal Water Pollution Control Requirements; Conditions

“Any discharge from a point source in the United States Virgin Islands in existence on the date of the enactment of this subsection [Aug. 5, 1983] which discharge is attributable to the manufacture of rum (as defined in [paragraphs \(3\) of section 7652\(c\) of the Internal Revenue Code of 1954](#) [section 7652(c)(3) of Title 26, Internal Revenue Code]) shall not be subject to the requirements of [section 301](#) [this section] (other than toxic pollutant discharges), section 306 [section 1316 of this title] or section 403 [section 1343 of this title] of the Federal Water Pollution Control Act if--

Certain Municipal Compliance Deadlines Unaffected; Exception

Section 21(a) of [Pub.L. 97-117](#) provided in part that: “The amendment made by this subsection [amending subsec. (i) (1) and (2)(B) of this section] shall not be interpreted or applied to extend the date for compliance with [section 301](#)(b) (1)(B) or (C) of the Federal Water Pollution Control Act [subsec. (b)(1)(B) or (C) of this section] beyond schedules for compliance in effect as of the date of enactment of this Act [Dec. 29, 1981], except in cases where reductions in the amount of financial assistance under this Act [[Pub.L. 97-117](#), see Short Title of 1981 Amendment set out under section 1251 of this title] or changed conditions affecting the rate of construction beyond the control of the owner or operator will make it impossible to complete construction by July 1, 1983.”

LAW REVIEW COMMENTARIES

Clearing the muddy waters? *Rapanos* and the post-*Rapanos* [Clean Water Act](#) jurisdictional guidance. Note, 44 *Hous. L. Rev.* 1491 (Winter 2008).

Defining “addition” of a pollutant into navigable waters from a point source under the [Clean Water Act](#): The questions answered--and those not answered--by *South Florida Water Management District v. Miccosukee Tribe of Indians*. Steven G. Davison, 16 *Fordham Env'tl L. Rev.* 1 (2004).

Does the [Clean Water Act](#) protect endangered species? The case of Maine's wild Atlantic salmon. Roger Fleming, 7 *Ocean & Coastal L.J.* 259 (2002).

Environmental law: The [Clean Water Act](#)--Understanding when a concentrated animal feeding operation should obtain an NPDES permit. 49 *Okla.L.Rev.* 481 (1996).

Federal wetlands protection under the [Clean Water Act](#): Regulatory ambivalence, intergovernmental tension, and a call for reform. Michael C. Blumm & D. Bernard Zaleha, 60 *U.Colo.L.Rev.* 695 (1989).

Fundamentally different factor variances under the **Clean Water Act**: Should they be applicable to toxic pollutants? Note, 29 Vill.L.Rev. 771 (1983-84).

Is FIFRA enough regulation?: Failure to obtain a NPDES permit for pesticide applications may violate the **Clean Water Act**. Note, 79 Chi.-Kent L. Rev. 317 (2004).

Legislation overlap: Should the **Clean Water Act** or the Federal Insecticide, Fungicide and Rodenticide Act prevail when pesticides end up in U.S. waters? Note, 79 Notre Dame L. Rev. 2183 (2004).

Mens rea and the “heightened criminal liability” imposed on violators of the **Clean Water Act**. Christine L. Wettach, 15 Stan.Envntl.L.J. 377 (1996).

Mining and water quality under the **Clean Water Act**. 25 Colo.Law. 93 (1996).

Municipal separate storm sewer system (MS4) regulation under the Federal **Clean Water Act**: The role of water quality standards? John H. Minan, 42 San Diego L. Rev. 1215 (2006).

Negotiating a voluntary agreement under the **Clean Water Act**--The Sunnyside experience. Christopher G. Hayes and William C. Robb, 26 Colo.Law. 95 (Mar.1997).

SWANCC: Effects on federal jurisdiction under the **Clean Water Act** and the expanded state roles in wetland protection. Note, 56 Baylor L. Rev. 281 (2004).

What's the “point” of the **Clean Water Act** following United States v. Plaza Health Laboratories, Inc.? Second Circuit acts as a legislator rather than as a court. Robin L. Greenwald, 60 Brook.L.Rev. 689 (1994).

Wetland protection under Section 404 of the **Clean Water Act**: An enforcement paradox. Comment, 27 San Diego L.Rev. 139 (1990).

RESEARCH REFERENCES

ALR Library

53 ALR, Fed. 2nd Series 1, Construction and Application of **Clean Water Act's** Total Maximum Daily Loads (Tmdls) Requirement for Waters Failing to Achieve Water Quality Standards Under 33 U.S.C.A. § 1313(D).

17 ALR, Fed. 2nd Series 309, Construction and Application of § 401 Water Quality Certification Requirement Under Federal **Clean Water Act**, 33 U.S.C.A. § 1341.

163 ALR, Fed. 531, Actions Brought Under Federal Water Pollution Control Act Amendments of 1972 (**Clean Water Act**) (33 U.S.C.A. § 1251 et seq.)--Supreme Court Cases.

53 ALR, Fed. 481, Criminal Proceedings, Under § 309(C)(1, 3) of the Federal Water Pollution Control Act (33 U.S.C.A. § 1319(C)(1, 3)), Based on Violation of § 301(A) of the Act (33 U.S.C.A. § 1311(A)), Prohibiting Discharge of Pollutants without a Permit.

Encyclopedias

26 Am. Jur. Proof of Facts 3d 395, Water Pollution: Proof of Water Quality Under the **Clean Water Act**.

36 Am. Jur. Proof of Facts 3d 533, Proof of Wrongful Discharge of Pollutant Into Waterway Under Federal **Clean Water Act**.

Forms

Am. Jur. Pl. & Pr. Forms Waters § 190.50, Complaint in Federal District Court--Citizen's Suit--Against Railway Company--For Damages and Penalties for Violation of Federal **Clean Water Act**.

Federal Procedural Forms § 21:46.50, Complaint--For Declaratory Judgment and Injunctive Relief--Exemption from **Clean Water Act** [5 U.S.C.A. §§ 701 et Seq.; 28 U.S.C.A. §§ 2201, 2202; 33 U.S.C.A. § 1344].

Federal Procedural Forms § 29:41.50, Complaint--For Declaratory Judgment and Injunctive Relief--Exemption from **Clean Water Act** [5 U.S.C.A. §§ 701 et Seq.; 28 U.S.C.A. §§ 2201, 2202; 33 U.S.C.A. § 1344].

Federal Procedural Forms § 50:214.50, Complaint in District Court--For Order Requiring Repeal of 40 C.F.R. § 122.3(H) as Ultra Vires to the **Clean Water Act** [40 C.F.R. § 122.3; 33 U.S.C.A. §§ 1251, 1311, 1342, 1362; 5 U.S.C.A. §§ 551 to 706; 28 U.S.C.A. §§ 1331, 1391, 2201, 2201].

Treatises and Practice Aids

West's Federal Administrative Practice § 5263, The **Clean Water Act**.

NOTES OF DECISIONS

Construction with other laws

Clean Water Act's (CWA) prohibition against pollutant discharges did not discriminate against those operating in rail transportation industry or impose unreasonable burden on rail transportation, and thus Interstate Commerce Commission Termination Act (ICCTA) did not override Environmental Protection Agency's (EPA) jurisdiction to enforce CWA against railway company and its general partner and operator. *U.S. v. St. Mary's Ry. West, LLC*, S.D.Ga.2013, 989 F.Supp.2d 1357, motion to certify appeal denied 2014 WL 12657147. *Environmental Law* 🔑 170

Purpose

Environmental Protection Agency's (EPA) inclusion of effluent limitations for suspended solids in its coal remining subcategory was not arbitrary or capricious; effluent limitations for solids was not inconsistent with the purpose of **Clean Water Act** (CWA) and would provide sufficient incentives for remining abandoned mine lands. *Citizens Coal Council v. U.S. E.P.A.*, C.A.6 2006, 447 F.3d 879. *Environmental Law* 🔑 186

Retroactive effect

Permitting scheme established by administrative rule promulgated by the Environmental Protection Agency (EPA) under the **Clean Water Act** (CWA) to regulate the emission of water pollutants by concentrated animal feeding operations (CAFO), requiring that every CAFO owner or operator either apply for a permit, and comply with the effluent limitations contained in the permit, or affirmatively demonstrate that no permit was needed because there was no potential to discharge, exceeded statutory authority granted by the CWA to regulate and control the actual discharge of pollutants; the CWA gave the EPA the authority to regulate only actual discharges, not potential discharges and not point sources themselves. *Waterkeeper Alliance, Inc. v. U.S. E.P.A.*, C.A.2 2005, 399 F.3d 486. *Environmental Law* 🔑 196

Shopping plaza owner did not violate **Clean Water Act** (CWA) by failing to obtain National Pollution Discharge Elimination System (NPDES) permit for stormwater discharge from parking lot, since discharge had been left unregulated before CWA Phase II regulations went into effect, and neither Environmental Protection Agency (EPA) nor state agency had exercised residual designation authority to require permit. *Conservation Law Foundation v. Hannaford Bros. Co.*, D.Vt.2004, 327 F.Supp.2d 325, affirmed 139 Fed.Appx. 338, 2005 WL 1712899. *Environmental Law* 🔑 196

Clean Water Act (CWA) complaint failed to state claim upon which relief could be granted where discharge alleged in complaint was derived from continued leaching from pre-1954 disposal of chromium-bearing waste. *Interfaith Community Organization v. AlliedSignal, Inc.*, D.N.J.1996, 928 F.Supp. 1339. *Environmental Law* 🔑 673

State regulation or control

Environmental Protection Agency (EPA), based on its statutory obligations under **Clean Water Act** (CWA), was required to give notice to public and afford it opportunity to comment on issues relevant to its determination that new definition of "zones of deposit" would reasonably ensure compliance with Alaska's water quality standards, although certification of the National Pollutant Discharge Elimination System (NPDES) general permit was vested with Alaska Department of Environmental Conservation (ADEC); EPA sought opinion of ADEC when determining that new definition would

ensure compliance with Alaska's water quality standards. [Natural Resources Defense Council v. U.S. E.P.A., C.A.9 2002, 279 F.3d 1180. Environmental Law 🔑 220](#)

Requirement that West Virginia Department of Environmental Protection obtain National Pollutant Discharge Elimination System (NPDES) permit, under **Clean Water Act** (CWA), for discharge of acid mine drainage from bond forfeiture mining sites was not inconsistent with duties under state law to prioritize treatment methods based on a cost-benefit analysis, and impose treatment costs on the mine operator, and even if it were, did not serve as basis for violating federal law by not obtaining permit. [West Virginia Highlands Conservancy, Inc. v. Huffman, S.D.W.Va.2009, 651 F.Supp.2d 512. Environmental Law 🔑 196; Environmental Law 🔑 206](#)

Environmental Protection Agency's (EPA's) approval of provision of Kentucky's water quality antidegradation rules under the **Clean Water Act** (CWA), pursuant to which approval of a publicly owned treatment works (POTW) regional facility plan met the requirements for an antidegradation review, was not arbitrary and capricious, although procedure did not require a show of public necessity as mandated by the CWA, where EPA reviewed relevant regulations and determined that the components designed for a development of a regional facility plan in Kentucky met the required decision making process under the CWA, and was in fact the equivalent of an antidegradation review. [Kentucky Waterways Alliance v. Johnson, W.D.Ky.2006, 426 F.Supp.2d 612, affirmed in part, reversed in part and remanded 540 F.3d 466, rehearing denied. Environmental Law 🔑 191](#)

Cornerstone of the **Clean Water Act** is that the discharge of any pollutant from a point source into navigable waters of the United States is unlawful unless the discharge is made according to the terms of a National Pollutant Discharge Elimination System (NPDES) permit obtained from either the United States Environmental Protection Agency (EPA) or from an authorized state agency. [Hiebenthal v. Meduri Farms, D.Or.2002, 242 F.Supp.2d 885. Environmental Law 🔑 196](#)

Rules and regulations

Permitting scheme established by administrative rule promulgated by the Environmental Protection Agency (EPA) under the **Clean Water Act** (CWA) to regulate the emission of water pollutants by concentrated animal feeding operations violated the CWA's public participation requirements and was otherwise arbitrary and capricious under the Administrative Procedure Act; although the preamble to the rule indicated that the EPA expected that the permitting authority would make the information available to the public upon request, the rule provided no assurance that the EPA's expectations would be satisfied. [Waterkeeper Alliance, Inc. v. U.S. E.P.A., C.A.2 2005, 399 F.3d 486. Environmental Law 🔑 196; Environmental Law 🔑 218](#)

Army Corps of Engineers was given authority over wetlands pursuant to the **Clean Water Act** as early as July 25, 1975 when regulations were published stating that waters of the United States included fresh water wetlands, even though certain regulations clarifying the Corps' responsibilities under the **Clean Water Act** did not go into effect until 1986. [Slagle v. U.S. By and Through Baldwin, D.Minn.1992, 809 F.Supp. 704. Environmental Law 🔑 118](#)

Mandatory nature of section

Clean Water Act's requirement that all discharges covered by statute have appropriate permit is unconditional and absolute. [Hudson River Fishermen's Ass'n v. Arcuri, S.D.N.Y.1994, 862 F.Supp. 73. Environmental Law 🔑 196](#)

Persons subject to limitations

Clean Water Act requires Forest Service to comply with all state water quality requirements. [Marble Mountain Audubon Soc. v. Rice, C.A.9 \(Cal.\) 1990, 914 F.2d 179. Environmental Law 🔑 188](#)

Pollutants subject to limitation

Chemical pesticide, antimycin, applied intentionally and aimed at eliminating a pestilent fish species, in accordance with a Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label, and with no residue or unintended effect was not “waste” and thus not a “pollutant” for the purposes of the **Clean Water Act** and not subject to the CWA's permit requirements. [Fairhurst v. Hagener, C.A.9 \(Mont.\) 2005, 422 F.3d 1146. Environmental Law 🔑 196](#)

Environmental Protection Agency's classification of settleable solids as nonconventional pollutant and thus subject to BAT standards was both reasonable and permissible construction of **Clean Water Act**, where Congress had not designated settleable solids as either conventional or toxic pollutant. [Rybachek v. U.S. E.P.A., C.A.9 1990, 904 F.2d 1276. Environmental Law 🔑 186](#)

No reliable scientific methodology or basis existed for remediation expert's opinion that releases from pesticide formulations facility posed imminent and substantial endangerment to human health and environment, and thus expert's opinion was not admissible in surrounding residents' action alleging violations of Resource Conservation and Recovery Act (RCRA), **Clean Water Act** (CWA), and state law, where expert conceded that further investigation was required to identify sources and extent of contamination, and that he did not undertake risk-based calculation essential to assessment of risks and remedies. [Lewis v. FMC Corp., W.D.N.Y.2011, 786 F.Supp.2d 690. Evidence 🔑 555.2](#)

Application of pesticides to waters of the United States consistent with requirements of Federal Insecticide and Rodenticide Act (FIFRA) does not constitute “discharge of pollutant” requiring permit pursuant to National Pollution Discharge Elimination System (NPDES) under **Clean Water Act** (CWA). [Peconic Baykeeper, Inc. v. Suffolk County, E.D.N.Y.2008, 585 F.Supp.2d 377, affirmed in part, vacated in part 600 F.3d 180. Environmental Law 🔑 196](#)

Genuine issues of material fact as to whether fecal coliform, a pollutant, traveled from coastal landowners' tract of land to water covered by the **Clean Water Act** (CWA), and as to whether alleged increase in fecal coliform levels in such navigable water was related to landowners' ditching activities, precluded summary judgment in citizen suit under CWA. [North Carolina Shellfish Growers Ass'n v. Holly Ridge Associates, LLC., E.D.N.C.2003, 278 F.Supp.2d 654, 357 N.C. 1429. Federal Civil Procedure 🔑 2498.3](#)

Wastewater flowing from piles of spent mushroom substrate (SMS), waste generated by the mushroom industry, would be “pollutant,” in context of the **Clean Water Act** (CWA) and Pennsylvania Clean Streams Law (PCSL); state, after testing wastewater, concluded that it was “extremely polluted,” and independent consultants hired by neighboring property owners concluded that the wastewater contained high levels of ammonia, total dissolved solids, and other pollutants, in excess of state and federal water quality standards, although mushroom waste processor had implemented vegetation boundaries. [Reynolds v. Rick's Mushroom Service, Inc., E.D.Pa.2003, 246 F.Supp.2d 449. Environmental Law 🔑 175](#)

Acid mine drainage flowing into creeks and containing high concentrations of aluminum, cadmium, copper, zinc, iron and sulfuric acid was “pollutant” for which **Clean Water Act's** (CWA) National Pollutant Discharge Elimination System (NPDES) required permit, regardless of historical levels of pollution. [Beartooth Alliance v. Crown Butte Mines, D.Mont.1995, 904 F.Supp. 1168. Environmental Law 🔑 178](#)

Water itself is not pollutant; therefore, simply moving water from one place to another does not constitute discharge of pollutant under **Clean Water Act** (CWA). [Bettis v. Town of Ontario, N.Y., W.D.N.Y.1992, 800 F.Supp. 1113. Environmental Law 🔑 175](#)

City violated **Clean Water Act** by discharging chlorine and alum floc into reservoir on navigable river, as result of adding chlorine and alum to water pumped from another river, without first obtaining a pollution emissions permit; chlorine residual, when discharged into navigable waters, was a “pollutant” within meaning of the Act, even though its intended use was beneficial, and alum sludge or floc was also a pollutant. [Hudson River Fishermen's Ass'n v. City of New York, S.D.N.Y.1990, 751 F.Supp. 1088, affirmed 940 F.2d 649. Environmental Law 🔑 206](#)

Discharge of raw sewage into river from privately owned septic system violated the **Clean Water Act**, in absence of permit. [Friends of Sakonnet v. Dutra, D.R.I.1990, 738 F.Supp. 623. Environmental Law 🔑 206](#)

Discharge of pollutant or fill--Generally

Delaware River was a “navigable water” within meaning of **Clean Water Act** (CWA) because it was a relatively permanent continuously flowing body of water forming geographic features that are described in ordinary parlance as rivers, and dredging qualified as the “discharge of a pollutant” because it resulted in the “addition” of “dredged spoil” to a navigable water. [Delaware Dept. of Natural Resources and Environmental Control v. U.S. Army Corps of Engineers, C.A.3 \(Del.\) 2012, 685 F.3d 259. Environmental Law 🔑 126; Environmental Law 🔑 136](#)

The evidence was sufficient to establish that defendant discharged pollutants into a creek, as element of offense of violating **Clean Water Act** by discharging and causing to be discharged pollutants into waters of the United States without a permit; even if defendant only ran heavy equipment in the creek bed, had log structures constructed in creek, and moved gravel and other materials during the periods of the year when the section of the creek he impacted was dry due to the operation of an irrigation diversion structure upstream, he still deposited pollutants in the creek, and the evidence supported a determination that defendant created a situation in which pollutants, including disturbed and moved materials and log structures, remained in the creek when the water was flowing. [U.S. v. Moses, C.A.9 \(Idaho\) 2007, 496 F.3d 984, certiorari denied 128 S.Ct. 2963, 554 U.S. 918, 171 L.Ed.2d 886, post-conviction relief dismissed 642 F.Supp.2d 1216. Environmental Law 🔑 743](#)

Army Corps of Engineers' failure to obtain a certificate of waiver prior to discharging dredged material in navigable waters from the Puerto Rico Environmental Quality Board in violation of Puerto Rico law and the **Clean Water Act** was not the proximate cause under Puerto Rico law of landowners' alleged damages caused by dredged material being blown onto their property after Corps deposited it on a nearby beach. [Montijo-Reyes v. U.S., C.A.1 \(Puerto Rico\) 2006, 436 F.3d 19. United States 🔑 911](#)

Inasmuch as discharges of groundwater derived from coal bed methane (CBM) extraction process altered river's water quality, those discharges caused “pollution” as defined by **Clean Water Act** (CWA). [Northern Plains Resource Council v. Fidelity Exploration and Development Co., C.A.9 \(Mont.\) 2003, 325 F.3d 1155, certiorari denied 124 S.Ct. 434, 540 U.S. 967, 157 L.Ed.2d 312, on subsequent appeal 185 Fed.Appx. 679, 2006 WL 1722474. Environmental Law 🔑 178](#)

For purposes of **Clean Water Act's** (CWA) definition of “discharge of a pollutant” to mean “any addition of any pollutant to navigable waters from any point source,” the transfer of water containing pollutants from one body of water to another, distinct body of water is an “addition,” and thus a “discharge” that demands National Pollutant Discharge Elimination System (NPDES) permit. [Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York, C.A.2 \(N.Y.\) 2001, 273 F.3d 481, on remand 207 F.Supp.2d 3, adhered to on reconsideration 451 F.3d 77, certiorari denied 127 S.Ct. 1373, 549 U.S. 1252, 167 L.Ed.2d 160.](#)

Non-structural best management practices (BMP) used by scrap metal recycling facilities did not prevent pollutants from coming into contact with storm water, and thus facilities' failure to include structural best management practices (BMP) in their storm water pollution prevention plans (SWPPP) violated provision of industrial storm water permit

issued pursuant to **Clean Water Act** (CWA) requiring BMPs to be developed and implemented to reduce or prevent pollutants in storm water discharges. *Santa Monica Baykeeper v. Kramer Metals, Inc.*, C.D.Cal.2009, 619 F.Supp.2d 914. [Environmental Law 🔑 197](#); [Environmental Law 🔑 206](#)

Environmental Protection Agency's (EPA's) approval of provisions of Kentucky's water quality antidegradation rules under the **Clean Water Act** (CWA), which permitted discharges with increased pollutant loadings of less than 20%, was not arbitrary and capricious, where EPA reviewed more than 60 possible discharge dilution scenarios, and checked past permit procedures and approvals, in determining that 20% increase in pollutants would result only in de minimis effect on water quality. *Kentucky Waterways Alliance v. Johnson*, W.D.Ky.2006, 426 F.Supp.2d 612, affirmed in part, reversed in part and remanded 540 F.3d 466, rehearing denied. [Environmental Law 🔑 191](#)

Sediment, consisting of sand and dirt, that was discharged into waters covered by the **Clean Water Act** (CWA) by coastal landowners' ditching activities constituted discharge of "pollutant" into waters of the United States, for which landowners were required to obtain discharge permit under the CWA. *North Carolina Shellfish Growers Ass'n v. Holly Ridge Associates, LLC.*, E.D.N.C.2003, 278 F.Supp.2d 654, 357 N.C. 1429. [Environmental Law 🔑 196](#)

Discharges of Acid mine drainage into navigable creeks without valid National Pollutant Discharge Elimination System (NPDES) permits violated **Clean Water Act** (CWA), even though mining company had applied to state for Montana Pollutant Discharge Elimination System (MPDES) storm water permit. *Beartooth Alliance v. Crown Butte Mines*, D.Mont.1995, 904 F.Supp. 1168. [Environmental Law 🔑 206](#)

Town's alleged diversion of natural stream and resultant flooding which damaged landowners' property and alleged fraud in connection with sale of subdivision lots to landowners did not constitute violations of **Clean Water Act** (CWA); there was no indication that any pollutants were discharged either into stream or from stream into another body of water, and alleged fraud actions suggested state claims, not federal ones. *Bettis v. Town of Ontario*, N.Y., W.D.N.Y.1992, 800 F.Supp. 1113. [Water Law 🔑 1385](#)

Filling in and grading or changing of the bottom elevations of stream constituted "discharge of a pollutant" under the **Clean Water Act** and discharge of "fill" under Army Corps of Engineers regulations. *U.S. v. Zanger*, N.D.Cal.1991, 767 F.Supp. 1030. [Environmental Law 🔑 136](#); [Environmental Law 🔑 196](#)

---- Fill, discharge of pollutant or fill

Property owners' use of earth-moving equipment to excavate, move and deposit dirt, rocks and other indigenous materials on property was "discharge of pollutant," not "incidental fallback," and thus owners were required to obtain permit under **Clean Water Act** (CWA). *U.S. v. Sartori*, S.D.Fla.1999, 62 F.Supp.2d 1362. [Environmental Law 🔑 196](#)

Marina owners' dumping of fill on natural marshlands of hook-like peninsula extending into waters within the national park violated the **Clean Water Act**, although owners' construction of docks and filling in of shoreline did not. *U.S. v. Schmitt*, E.D.N.Y.1998, 999 F.Supp. 317, affirmed 28 Fed.Appx. 63, 2002 WL 108564. [Environmental Law 🔑 136](#); [Water Law 🔑 1250\(2\)](#)

Property owner violated **Clean Water Act** by constructing feeder ditches and basins and discharging "fill," which was defined pollutant, into areas that district court had found to be subject to jurisdiction of Act, without obtaining permit required by Act. *Leslie Salt Co. v. U.S.*, N.D.Cal.1992, 820 F.Supp. 478, affirmed in part 55 F.3d 1388, certiorari denied 116 S.Ct. 407, 516 U.S. 955, 133 L.Ed.2d 325. [Environmental Law 🔑 136](#)

Party unlawfully “discharges pollutant” in violation of the **Clean Water Act** when, inter alia, he unlawfully dumps fill dirt on wetlands without permit. [Matter of Alameda County Assessor's Parcel Nos. 537-801-2-4 and 537-850-9, N.D.Cal.1987, 672 F.Supp. 1278. Environmental Law 🔑 196](#)

---- Ongoing violations, discharge of pollutant or fill

Fish and Wildlife Service (FWS) discharged pollutants from fish hatchery without a National Pollutant Discharge Elimination System (NPDES) permit in violation of the **Clean Water Act** (CWA); hatchery's NPDES permit had expired, hatchery's NPDES permit was not automatically extended, and Environmental Protection Agency (EPA) had not issued a new permit. [Center for Environmental Law and Policy v. United States Fish and Wildlife Service, E.D.Wash.2017, 228 F.Supp.3d 1152. Environmental Law 🔑 206](#)

Operator of a waste recycling facility violated the **Clean Water Act** (CWA) by failing to implement any best management practices that utilized the best available technology and best conventional technology to reduce or eliminate pollutants associated with industrial activity in storm water discharges, even though operator had installed straw wattles and a detention basin, where the wattles had been rated by the regional water quality control board as ineffective, and the detention basin was not large enough to capture run-off from an 85th-percentile, 24-hour storm event, as required by a general storm water discharge permit. [California Sportfishing Protection Alliance v. River City Waste Recyclers, LLC, E.D.Cal.2016, 205 F.Supp.3d 1128. Environmental Law 🔑 226](#)

Environmental organizations' allegations that water sampler detected elevated levels of selenium less than one mile downstream from landowner's valley fill and that there were no other sources of selenium in the area were sufficient to allege that discharges were ongoing, as required to state a claim against landowner for violation of **Clean Water Act** (CWA) provision prohibiting discharge of pollutants without a permit. [Ohio Valley Environmental Coalition, Inc. v. Hernshaw Partners, LLC, S.D.W.Va.2013, 984 F.Supp.2d 589. Environmental Law 🔑 226](#)

---- Point source, discharge of pollutant or fill

Unless there is a discharge of any pollutant, there is no violation of the **Clean Water Act**, and point sources are, accordingly, neither statutorily obligated to comply with Environmental Protection Agency (EPA) regulations for point source discharges, nor are they statutorily obligated to seek or obtain an National Pollution Discharge Elimination System (NPDES) permit. [Service Oil, Inc. v. U.S. E.P.A., C.A.8 2009, 590 F.3d 545. Environmental Law 🔑 206](#)

Defendants' conduct in severing 250-ton concrete and rebar block from stern of ferrous concrete barge and dumping it into bay, severing approximately one hundred pieces of rebar and attached concrete from barge's stern and dropping it into lagoon, and conducting sandblasting operations on floating barge that projected sand and paint chip residue into bay constituted discharge of pollutant from point source, and thus violated **Clean Water Act**, in that barge was “floating craft” expressly included within definition of “point source.” [U.S. v. West Indies Transport, Inc., C.A.3 \(Virgin Islands\) 1997, 127 F.3d 299, certiorari denied 118 S.Ct. 700, 522 U.S. 1052, 139 L.Ed.2d 644, denial of post-conviction relief affirmed 60 Fed.Appx. 412, 2003 WL 1564255. Environmental Law 🔑 206](#)

Pipeline that leaked 369,000 gallons of petroleum products, spill site, and seeps, flows, and fissures from spill site, as well as remediation efforts for discharge of pollutants from leak did not constitute “point source,” within meaning of **Clean Water Act** (CWA), prohibiting discharge of pollutant into navigable waters from any point source except as authorized by National Pollution Discharge Elimination System (NPDES) permit, since pipeline did not leak pollutants directly into navigable waters, but rather discharged pollutants into soil and groundwater that allegedly “may” reach navigable waters, and spill site, seeps, flows, fissures, and remediation efforts were not discernible, confined, and discrete

mechanisms conveying pollutants to navigable waters. [Upstate Forever v. Kinder Morgan Energy Partners, L.P.](#), D.S.C.2017, 2017 WL 2266875. [Environmental Law](#) 🔑 226

Construction activities in connection with development of dairy facilities on 557 acres for 699 cow dairy operation, for potential future expansion to up to 2000 cows, to which agricultural exemptions under relevant regulations did not apply constituted “point source,” for which owner was required to obtain National Pollutant Discharge Elimination System (NPDES) permit under [Clean Water Act](#) (CWA), since development involved over five acres of real estate. [Friends of Maha'ulepu, Inc. v. Hawai'i Dairy Farms, LLC](#), D.Hawai'i 2016, 224 F.Supp.3d 1094. [Federal Civil Procedure](#) 🔑 2498.3

Operator of a waste recycling facility's storm water pollution prevention plans (SWPPP) failed to identify the sources of pollution that affected the quality of storm water discharges and failed to describe and ensure the implementation of best management practices, and thus violated the [Clean Water Act](#) (CWA) by failing to comply with a general storm water discharge permit, where the prevention plans failed to list heavy metals and other contaminants found in operator's own tests as potential pollutants, the prevention plans failed to list car parts and consumer electronics processed at the facility as potential sources of pollution, and several site maps failed to specifically delineate all of the facility's boundaries, nearby water bodies, municipal storm drain inlets, and areas of industrial activity. [California Sportfishing Protection Alliance v. River City Waste Recyclers, LLC](#), E.D.Cal.2016, 205 F.Supp.3d 1128. [Environmental Law](#) 🔑 184

Outfall pipes on bond forfeiture mining sites operated and controlled by West Virginia Department of Environmental Protection were “point sources” for discharge of acid mine drainage within meaning of [Clean Water Act](#) (CWA), as required to establish violation of National Pollutant Discharge Elimination System (NPDES) permit requirement due to the absence of a permit; United States Environmental Protection Agency (EPA) and Office of Surface Mining (OSM) had not interpreted bond forfeiture sites, operated by states, to be exempt from NPDES permitting requirements, and outfalls had physical characteristics of a point source. [West Virginia Highlands Conservancy, Inc. v. Huffman](#), S.D.W.Va.2009, 651 F.Supp.2d 512. [Environmental Law](#) 🔑 206

Environmental organization that brought citizen's suit against timber companies and Environmental Protection Agency (EPA) properly alleged that company employed unpermitted conduits to discharge stormwater and pollutants from logging activities into creek, as required to state claim under [Clean Water Act](#) (CWA); complaint averred that company's culverts and drainage ditches on logging sites constituted discharge “point sources” for which National Pollutant Discharge Elimination System (NPDES) permit was required. [Environmental Protection Information Center v. Pacific Lumber Co.](#), N.D.Cal.2004, 301 F.Supp.2d 1102, motion to certify denied 2004 WL 838160. [Environmental Law](#) 🔑 206

Fruit processor's discharge of water, produced in process of drying fruit, to irrigate fields, was not a discharge from a point source, as required to support [Clean Water Act](#) (CWA) citizen suit against processor, although processor allegedly applied wastewater to its fields in excess of crops' actual absorption of water. [Hiebenthal v. Meduri Farms](#), D.Or.2002, 242 F.Supp.2d 885. [Environmental Law](#) 🔑 175

Monitored discharge

Operator of a waste recycling facility failed to implement a site-specific monitoring and reporting program to determine the effectiveness of the facility's pollution controls, as required by a general storm water discharge permit, and thus operator violated the [Clean Water Act](#) (CWA), where operator failed to conduct monthly visual observations of storm water discharges, operator failed to sample and analyze storm water discharge from a second rain event for one season, and operator failed to provide an analysis of iron, aluminum, lead, copper, zinc, or chemical oxygen demand levels in an annual report. [California Sportfishing Protection Alliance v. River City Waste Recyclers, LLC](#), E.D.Cal.2016, 205 F.Supp.3d 1128. [Environmental Law](#) 🔑 206

Waters into which discharge prohibited--Generally

River and pond were two distinct “waters of the United States,” within meaning of the **Clean Water Act** (CWA) and, thus, proposed transfer of water from river through skiing facility's snowmaking pipes to pond, resulting in transfer of pollutants, constituted addition of pollutants to pond from point source requiring National Pollutant Discharge Elimination System (NPDES) permit; although water was hydrologically connected by flow down from pond to river, water could not flow naturally from river up to pond, river undisputedly contained pollutants not found in pond, and water would be subject to private control during passage through pipes. *Dubois v. U.S. Dept. of Agriculture*, C.A.1 (N.H.) 1996, 102 F.3d 1273, certiorari denied 117 S.Ct. 2510, 521 U.S. 1119, 138 L.Ed.2d 1013. [Environmental Law 173](#); [Environmental Law 196](#)

Creek running through property owner's land was relatively permanent, flowing body of water that connected to traditional interstate navigable water, and therefore, was a water of the United States, for purposes of government's action under **Clean Water Act** against owner for allegedly discharging fill material into creek without a permit; creek had water flowing in it continuously through the year, creek bed had no vegetation, which was consistent with continuous flow through the year, and creek connected to Big Born River, which was an interstate river that was navigable. *U.S. v. Hamilton, D.Wyo.*2013, 952 F.Supp.2d 1271. [Environmental Law 136](#)

Provision of **Clean Water Act**, which prohibited discharge of pollutants into “waters of the United States,” granted United States jurisdiction over wetlands only if there existed a “significant nexus” between wetlands in question and navigable waters in the traditional sense. *U.S. v. Freedman Farms, Inc.*, E.D.N.C.2011, 786 F.Supp.2d 1016. [Environmental Law 128](#); [Environmental Law 173](#)

Genuine issue of material fact existed as to whether creek was a “water of the United States” covered by the **Clean Water Act** (CWA), precluding summary judgment for operator of shooting range in action alleging that it violated the **Clean Water Act** (CWA) by discharging pollutants, namely, lead bullets, into the creek without first obtaining a National Pollution Discharge Elimination System (NPDES) permit. *Benjamin v. Douglas Ridge Rifle Club, D.Or.*2009, 673 F.Supp.2d 1210. [Federal Civil Procedure 2498.3](#)

Winds of 41 miles per hour were not “strong winds” as contemplated by regulation excluding tides affected by strong winds such as those accompanying hurricane or other intense storm from definition of high tide line for purposes of landward limit of **Clean Water Act** jurisdiction in tidal waters. *U.S. v. Malibu Beach, Inc.*, D.N.J.1989, 711 F.Supp. 1301. [Environmental Law 173](#)

Discharge of waste materials, including methylene chloride, trichloroethane, and toluene into ditch on property, which flowed from there into a brook and ultimately into a navigable water, without discharge permit, violated the **Clean Water Act**. *U.S. v. Ottati & Goss, Inc.*, D.N.H.1985, 630 F.Supp. 1361. [Environmental Law 206](#)

---- Tributaries, waters into which discharge prohibited

Creek that defendant rerouted and reshaped constituted a water of the United States, for purposes of the **Clean Water Act** prohibition against discharging and causing to be discharged pollutants into waters of the United States without a permit; although, due to an irrigation diversion structure installed upstream of section of creek that defendant altered, water only flowed in that section for about two months per year during spring runoff, the creek was a tributary of a river that qualified as a water of the United States. *U.S. v. Moses, C.A.9 (Idaho)* 2007, 496 F.3d 984, certiorari denied 128 S.Ct. 2963, 554 U.S. 918, 171 L.Ed.2d 886, post-conviction relief dismissed 642 F.Supp.2d 1216. [Environmental Law 196](#)

---- Wetlands, waters into which discharge prohibited

Wetlands on defendants' properties were "waters of the United States" for purposes of the **Clean Water Act** (CWA), and therefore Government had jurisdiction to bring action alleging that defendants' unauthorized dredging and filling of those wetlands violated CWA; there was a significant nexus between the wetlands and a traditional navigable-in-fact water, since defendants' activities diminished the wetlands' ability to store water and filter or trap sediment, affecting the chemical, physical, and biological integrity of a navigable river. *U.S. v. Cundiff*, W.D.Ky.2007, 480 F.Supp.2d 940, affirmed 555 F.3d 200, certiorari denied 130 S.Ct. 74, 558 U.S. 818, 175 L.Ed.2d 27. [Environmental Law 🔑 136](#)

Given uncertain state of law as to whether **Clean Water Act** applies to isolated wetlands, counsel for defendant charged with illegally discharging fill material into wetlands without permit did not render ineffective assistance in failing to preserve issue of applicability of Act to isolated wetlands. *U.S. v. Suarez*, D.Guam 1994, 846 F.Supp. 892. [Criminal Law 🔑 1910](#)

Clean Water Act prohibition against discharge of pollutants into navigable waters does not apply to excavation or dredging activities occurring on wetlands. *Salt Pond Associates v. U.S. Army Corps of Engineers*, D.Del.1993, 815 F.Supp. 766. [Environmental Law 🔑 136](#); [Environmental Law 🔑 175](#)

---- Particular waters, waters into which discharge prohibited

Pollutants created as result of development of dairy facilities on 557 acres for 699 cow dairy operation, for potential future expansion to up to 2000 cows, to which agricultural exemptions under relevant regulations did not apply could have been discharged into navigable waters within meaning of **Clean Water Act** (CWA), where pollutants could have passed through conveyances that ultimately discharged into Pacific Ocean. *Friends of Maha'ulepu, Inc. v. Hawai'i Dairy Farms, LLC*, D.Hawai'i 2016, 224 F.Supp.3d 1094. [Environmental Law 🔑 196](#); [Environmental Law 🔑 201](#)

Documents prepared by the Environmental Protection Agency (EPA) after owner refused EPA access to property owner's property, which investigated whether the property was connected to waters of the United States, as required to fall under the **Clean Water Act** (CWA), were prepared in anticipation of litigation, and thus were protected from discovery under the work-product protection doctrine, where the documents were prepared by EPA staff that were supervised or acting at the direction of EPA counsel, and it was highly likely, given owner's refusal to cooperate with the EPA, that the EPA would bring an enforcement action. *United States v. Acquest Transit LLC*, W.D.N.Y.2017, 319 F.R.D. 83. [Federal Civil Procedure 🔑 1604\(1\)](#)

---- Groundwater discharges, waters into which discharge prohibited

Discharge of effluent at facility significantly affected ocean's physical, biological and chemical integrity, and effect was neither speculative nor insubstantial, thus county's discharge of pollutants into aquifer beneath facility without National Pollutant Discharge Elimination System (NPDES) permit violated **Clean Water Act** (CWA); facility released three to five million gallons of effluent a day, independent Environmental Protection Agency (EPA) study determined that at least 50% of this effluent made its way relatively rapidly into the ocean, effluent had properties that could radically alter properties of water it was introduced into, and such radical effects had been observed and measured at point of discharge into ocean. *Hawai'i Wildlife Fund v. County of Maui*, D.Hawai'i 2014, 24 F.Supp.3d 980, motion to certify appeal denied 2015 WL 1608430. [Environmental Law 🔑 196](#); [Environmental Law 🔑 206](#)

Any pollutants that enter surface waters either directly or through groundwater are subject to regulation by national pollutant discharge elimination system (NPDES) permit, as **Clean Water Act's** (CWA) goal is to protect quality of

surface waters. [Williams Pipe Line Co. v. Bayer Corp., S.D.Iowa 1997, 964 F.Supp. 1300. Environmental Law 🔑 175;](#)
[Environmental Law 🔑 196](#)

Allegations that refinery discharged pollutants into soils and groundwater beneath refinery which then made their way to creek through groundwater stated cause of action under [Clean Water Act](#); Act's preclusion of discharge of pollutant into navigable waters included such discharge which reached navigable waters through groundwater. [Sierra Club v. Colorado Refining Co., D.Colo.1993, 838 F.Supp. 1428. Environmental Law 🔑 673](#)

Effluent limitations--Generally

Environmental Protection Agency (EPA), in promulgating whole effluent toxicity (WET) test methods for discharges, adequately accounted for failure to establish detection limits, as required under [Clean Water Act](#) (CWA); since WET testing was biological and experimental method, rather than instrumental, detection limit concepts were inapplicable. [Edison Elec. Institute v. E.P.A., C.A.D.C.2004, 391 F.3d 1267, 364 U.S.App.D.C. 60. Environmental Law 🔑 207](#)

Application of objective stated in Pub.L. 89-298, [Title III, § 301](#), Oct. 27, 1965, 79 Stat. 1089, that State of Indiana, prior to construction of harbor project, shall furnish assurance satisfactory to Secretary of Army that water and air pollution sources will be controlled to maximum extent feasible in order to minimize any adverse effects on public recreational areas in general vicinity of Burns Harbor to pollutant discharge elimination system permit does not result in adoption of standard more stringent than applicable standards under this section. [Porter County Chapter of Izaak Walton League of America, Inc. v. Costle, C.A.7 1978, 571 F.2d 359, certiorari denied 99 S.Ct. 115, 439 U.S. 834, 58 L.Ed.2d 130. Environmental Law 🔑 170; Environmental Law 🔑 250](#)

For purposes of [Clean Water Act](#) (CWA), "effluent limitation" is measurement and restriction of end-of-pipe discharge, whereas "state water quality standard" is not direct measurement of pollutant discharge, but is measurement of surrounding ocean and is expressed in narrative and numerical form. [Save Our Bays and Beaches v. City and County of Honolulu, D.Hawai'i 1994, 904 F.Supp. 1098. Environmental Law 🔑 183](#)

"Effluent standard or limitation," violations of which are actionable under the citizen suit provision of the [Clean Water Act](#), includes effluent standards or limits prescribed in National Pollution Discharge Elimination System (NPDES) permits and, additionally, violations of terms contained in NPDES permits are generally enforceable of their own accord in citizen suits. [Citizens for a Better Environment-California v. Union Oil Co. of California, N.D.Cal.1994, 861 F.Supp. 889, affirmed 83 F.3d 1111, as amended, certiorari denied 117 S.Ct. 789, 519 U.S. 1101, 136 L.Ed.2d 731. Environmental Law 🔑 226](#)

--- Individual basis, effluent limitations

Under provisions of [Clean Water Act](#) requiring Environmental Protection Agency to establish effluent limitations for categories and classes of point sources, and requiring Agency to designate category or categories of sources to which pretreatment standards apply, agency need not account for all possible differences among plants and may fix single-pretreatment standard. [Reynolds Metals Co. v. U.S.E.P.A., C.A.4 1985, 760 F.2d 549. Environmental Law 🔑 183](#)

--- Internal waste streams, effluent limitations

[Clean Water Act](#) authorizes Environmental Protection Agency (EPA) to impose effluent limitations on internal waste streams of National Pollutant Discharge Elimination System (NPDES) permittee when such limitations would be impracticable to monitor at point of discharge into waters of United States. [Public Service Co. of Colorado, Fort St. Vrain Station v. U.S. E.P.A., C.A.10 1991, 949 F.2d 1063. Environmental Law 🔑 197](#)

--- Miscellaneous effluent limitations

In issuing permit to mining company for use of lake as a disposal site, Corps of Engineers (Corps) violated the **Clean Water Act** (CWA), even though mine's discharge facially met regulatory definition of "fill material"; discharge would violate effluent limitations and performance standards applicable to mining company's froth-flotation mill. [Southeast Alaska Conservation Council v. U.S. Army Corps of Engineers, C.A.9 \(Alaska\) 2007, 479 F.3d 1148. Environmental Law 🔑 196](#)

Environmental Protection Agency (EPA) did not violate *Chevron* or act arbitrarily or capriciously in promulgating, pursuant to **Clean Water Act** (CWA), rule establishing effluent limitation guidelines for reclamation areas at coal mining sites in the arid Western United States; EPA's determination that alternative controls were appropriate for the new subcategory of reclamation areas was based on several reasons supported in the administrative record, namely that sediment was a natural component of runoff in western watersheds, sediment was typically the only parameter of concern in runoff in western alkaline reclamation areas, "best management practices" (BMPs) were proven to be effective at controlling sediment, and computer modeling procedures could accurately predict sediment runoff conditions, and EPA sufficiently demonstrated that continued use of current effluent limitations for settleable solids and pH was infeasible, and that replacing them with BMPs was supported by the record and was not arbitrary and capricious. [Citizens Coal Council v. U.S. E.P.A., C.A.6 2006, 447 F.3d 879. Environmental Law 🔑 186](#)

Genuine issues of material fact existed as to whether abandoned mine shaft was the source of polluted water flowing through a tunnel to a navigable waterway, precluding summary judgment for environmental groups in their citizen suit alleging that mine owner violated **Clean Water Act** (CWA) by discharging pollutants without a permit; experts did not agree on whether pollutants coming from the shaft were ever discharged into the navigable waterway. [Sierra Club v. El Paso Gold Mines, Inc., C.A.10 \(Colo.\) 2005, 421 F.3d 1133, corrected, rehearing granted in part, certiorari denied 126 S.Ct. 1653, 547 U.S. 1065, 164 L.Ed.2d 411. Federal Civil Procedure 🔑 2498.3](#)

Provision of administrative rule promulgated by the Environmental Protection Agency (EPA) under the **Clean Water Act** (CWA) to regulate the emission of water pollutants by concentrated animal feeding operations allowing permitting authorities to issue permits without reviewing the terms of nutrient management plans violated statutory provisions of CWA requiring permitting authorities to assure compliance with all effluent limitations and standards for land applications of manure, litter, and process waste water, and was otherwise arbitrary and capricious under the Administrative Procedure Act (APA). [Waterkeeper Alliance, Inc. v. U.S. E.P.A., C.A.2 2005, 399 F.3d 486. Environmental Law 🔑 196](#)

Environmental Protection Agency (EPA) did not act arbitrarily or capriciously in its proposed **Clean Water Act** rules governing effluent standards for bleached papergrade kraft (BPK) subcategory of pulp and paper mill processes, by setting monthly maximum effluent limitation at 95th percentile of distribution of monthly measurements rather than 99th percentile; agency explained that purpose of setting monthly average limitations at lower level was to ensure that mills achieved long-term average effluent levels. [National Wildlife Federation v. E.P.A., C.A.D.C.2002, 286 F.3d 554, 351 U.S.App.D.C. 42, rehearing en banc denied, supplemented 351 F.3d 1157, 359 U.S.App.D.C. 13. Environmental Law 🔑 186](#)

Riverfront property owner sufficiently alleged that neighbor's unlicensed pier storage facility and vessels that had been grounded were fill that changed the bottom elevation of the river, as required to state a claim for unauthorized dumping of fill under the **Clean Water Act** (CWA) and its implementing regulations. [307 Campostella, LLC v. Mullane, E.D.Va.2015, 143 F.Supp.3d 407. Environmental Law 🔑 136](#)

Environmental Protection Agency's (EPA's) approval of provisions of Kentucky's water quality antidegradation rules under the **Clean Water Act** (CWA), which permitted a new or expanding non-domestic discharger to a high quality water to accept permit limits that were no more than one-half of the water quality-based effluent limitations that would have been allowed at standard design conditions, was not arbitrary and capricious, where EPA reviewed past permits, to determine how often facilities had been permitted to expand and estimate the potential number of expansions that could occur in the future, in finding that the provision preserved almost all remaining assimilative capacity, and would not result in a significant degradation of high quality waters. *Kentucky Waterways Alliance v. Johnson*, W.D.Ky.2006, 426 F.Supp.2d 612, affirmed in part, reversed in part and remanded 540 F.3d 466, rehearing denied. *Environmental Law* 🔑 197

Genuine issue of material fact as to whether testing method employed by zinc mine operator to measure turbidity was equivalent to that required by its National Pollutant Discharge Elimination System (NPDES) permit precluded summary judgment in action against operator under **Clean Water Act** for failing to collect 24-hour composite sample for turbidity. *Adams v. Teck Cominco Alaska, Inc.*, D.Alaska 2006, 414 F.Supp.2d 925. *Federal Civil Procedure* 🔑 2498.3

Association of coal producers lacked “significantly protectable interest” in environmental advocacy organizations' lawsuit challenging Environmental Protection Agency's (EPA) decision not to develop total maximum daily loads (TMDLs) for streams identified as biologically impaired, under **Clean Water Act** (CWA), due to ionic stress, and thus, association could not intervene as matter of right, where there were too many steps involving nebulous goals and discretion of EPA and state agency between potential judgment in organizations' favor and any possible adverse consequence to association members' interests in property, coal reserves, or water treatment costs from potentially more stringent effluent limitations on members' national pollution discharge elimination system (NPDES) permits. *Ohio Valley Environmental Coalition, Inc. v. McCarthy*, S.D.W.Va.2015, 313 F.R.D. 10. *Federal Civil Procedure* 🔑 315

Best available technology economically achievable

Environmental Protection Agency (EPA) acted reasonably in choosing as best available technology for beef and cattle concentrated animal feeding operations (CAFOs) an option requiring that groundwater-related requirements be implemented, as necessary, on a case-by-case basis, rather than uniformly imposed, when promulgating rule under the **Clean Water Act** (CWA) to regulate the emission of water pollutants by CAFOs; studies showed that variability in topography, climate, distance to surface water, and geologic facts influenced whether and how pollutant discharges at a particular site entered surface water via groundwater, and EPA's final economic analysis showed a nearly six-fold increase in the number of beef, dairy, and heifer CAFOs projected to close were the option requiring uniform, rather than case-by-case implementation, adopted. *Waterkeeper Alliance, Inc. v. U.S. E.P.A.*, C.A.2 2005, 399 F.3d 486. *Environmental Law* 🔑 186

In determining economic achievability of technology, Environmental Protection Agency must consider “cost” of meeting BAT limitations, but need not compare such cost with benefits of effluent reduction in promulgating regulations under **Clean Water Act**; EPA has considerable discretion in weighing technology's costs, which are less important factors than in setting BPT limitations. *Rybachek v. U.S. E.P.A.*, C.A.9 1990, 904 F.2d 1276. *Environmental Law* 🔑 184

Pursuant to Federal Water Pollution Control Act Amendments of 1972, § 301(b)(2)(F), 33 U.S.C.A. § 1311(b)(2)(F), requiring that Environmental Protection Agency promulgate best available technology economically achievable-based effluent limitation guidelines applicable to nonconventional pollutants not later than July 1, 1987, Agency was authorized to impose best available technology economically achievable limitation on nonconventional pollutants until such guidelines were promulgated. *American Petroleum Institute v. E.P.A.*, C.A.5 1986, 787 F.2d 965. *Environmental Law* 🔑 186

Auto wrecking, recycling, and storage facility operator violated **Clean Water Act** (CWA) by failing to implement best management practices (BMP) required by its stormwater pollution prevention plan (SWPPP), failing to complete Level 1 corrective action for oil sheen, and failing to sample stormwater discharge. [Waste Action Project v. Astro Auto Wrecking, LLC](#), W.D.Wash.2017, 2017 WL 1229186. [Environmental Law](#) 🔑 223

Genuine issue of material fact as to whether owner and operator of scrap metal recycling plants had best management practices (BMP) that achieved best available technology economically achievable (BAT) for toxic and non-conventional pollutants and best conventional pollutant control technology (BCT) for conventional pollutants, despite sampling orders of magnitude in excess of benchmark levels set out in Environmental Protection Agency's (EPA) multi-sector general permit for stormwater discharges associated with industrial activity (MSGP), precluded summary judgment in action alleging that owner did not comply with terms of its industrial storm water permit, in violation of **Clean Water Act** (CWA). [Santa Monica Baykeeper v. Kramer Metals, Inc.](#), C.D.Cal.2009, 619 F.Supp.2d 914. [Federal Civil Procedure](#) 🔑 2498.3

Compliance deadline--Generally

National Pollutant Discharge Elimination System permit of municipal owner-operator of sewage treatment works did not extend municipality's deadline for abiding by secondary-treatment standards rather than interim standards after July 1, 1983; **Clean Water Act** Amendments established that EPA had no authority to extend secondary-treatment standard deadlines beyond July 1, 1983, applicable provisions of permit itself established that municipality was to meet secondary-treatment standards by July 1, 1983, and even if requirement that municipality comply with secondary-treatment standards after July 1, 1983, were not clearly stated in permit, NPDES permit was to be governed by regulatory parameters set down by Congress and interpretation of EPA plan. [U.S. v. City of Hoboken](#), D.N.J.1987, 675 F.Supp. 189. [Environmental Law](#) 🔑 185

Variations

Legislative history of amendment to the **Clean Water Act** prohibiting modification of standards for toxic pollutants did not show an unambiguous congressional intent to forbid all fundamentally different factor variations with respect to toxic materials, so that, grant of fundamentally different factor variations with respect to toxic pollutants does not threaten to frustrate the goals and operation of the statutory scheme of the **Clean Water Act** set up by Congress. [Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc.](#), U.S.1985, 105 S.Ct. 1102, 470 U.S. 116, 84 L.Ed.2d 90. [Environmental Law](#) 🔑 202

Environmental Protection Agency did not contravene **Clean Water Act** by limiting miners' ability to obtain variations because of its classification of settleable solids as toxic pollutant indicator; although BAT limitations for nonconventional pollutants were normally subject to modification under Act, modification for settleable solids would be unavailable because of their status as an indicator in toxic pollutants; however, miners might still apply for fundamentally different factors (FDF) variance. [Rybachek v. U.S. E.P.A.](#), C.A.9 1990, 904 F.2d 1276. [Environmental Law](#) 🔑 202; [Environmental Law](#) 🔑 203

Environmental Protection Agency's (EPA's) approval of provision of Kentucky's water quality antidegradation rules under the **Clean Water Act** (CWA), pursuant to which discharges subject to storm water general permits were not subject to antidegradation review, was not arbitrary and capricious, where EPA took important economic and social interests into consideration and found that Kentucky had right to exercise its discretion when assigning or renewing general permits, and that any potential storm water discharges under the general permit would be a de minimis lowering of the water quality. [Kentucky Waterways Alliance v. Johnson](#), W.D.Ky.2006, 426 F.Supp.2d 612, affirmed in part, reversed in part and remanded 540 F.3d 466, rehearing denied. [Environmental Law](#) 🔑 191; [Environmental Law](#) 🔑 196

Exemptions or exclusions

County's maintenance of drainage ditch system for mosquito control, the purpose of which was to drain surface waters, fell within statutory exemption from pollutant discharge provisions of **Clean Water Act** (CWA) and did not require permit. *Peconic Baykeeper, Inc. v. Suffolk County*, C.A.2 (N.Y.) 2010, 600 F.3d 180. [Environmental Law 🔑 196](#)

County's continued application of pesticides to control mosquito population, so long as it was consistent with EPA-approved Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) labeling, was in compliance with EPA's final rule excepting such compliant applications from **Clean Water Act** (CWA) permitting requirements, until such time as stay of rule's vacatur had expired. *Peconic Baykeeper, Inc. v. Suffolk County*, C.A.2 (N.Y.) 2010, 600 F.3d 180. [Environmental Law 🔑 196](#)

Sugar cane farm's discharge of water resulting from rainfall into lake was “agricultural stormwater discharge” within meaning of **Clean Water Act** (CWA) exemption, even if stormwater was pumped into lake rather than flowing there naturally, and thus any pollutants originating on farm that were thereby discharged into lake via rainwater did not require a National Pollutant Discharge Elimination System (NPDES) permit. *Fishermen Against Destruction of Environment, Inc. v. Closter Farms, Inc.*, C.A.11 (Fla.) 2002, 300 F.3d 1294, rehearing and rehearing en banc denied 52 Fed.Appx. 489, 2002 WL 31415798. [Environmental Law 🔑 175](#); [Environmental Law 🔑 196](#)

Landowner's actions in clearing site and constructing logging roads without a permit fell within **Clean Water Act's** (CWA) recapture provision, and therefore his activities, which resulted in the discharge of pollutants into wetlands, violated CWA, regardless of whether his activities were exempt under the exemptions for normal silviculture or construction and maintenance of forest roads; since he developed the site with the intent of establishing a red pine plantation that had not previously existed there, landowner's acts were clearly done with purpose of bringing the site into a new use. *U.S. v. Huseby*, D.Minn.2012, 862 F.Supp.2d 951. [Environmental Law 🔑 137](#)

Toxic pollutants

Language of provision of the **Clean Water Act** prohibiting the Environmental Protection Agency from modifying effluent limitations insofar as toxic materials are concerned did not foreclose EPA's view of the statute as allowing it to issue fundamentally different factor variances with respect to toxic pollutants and that interpretation was permissible. *Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc.*, U.S.1985, 105 S.Ct. 1102, 470 U.S. 116, 84 L.Ed.2d 90. [Environmental Law 🔑 202](#)

Environmental impact statement

Army Corps of Engineers was not required to include in its verification letters a statement that it evaluated cumulative effect of a proposed domestic oil pipeline's multiple water crossings in verifying that discharges from pipeline satisfied requirements for a pre-existing general permit under **Clean Water Act** (CWA). *Sierra Club v. United States Army Corps of Engineers*, D.D.C.2013, 990 F.Supp.2d 9. [Environmental Law 🔑 195](#)

Jurisdiction

Army Corps of Engineers' revised jurisdictional determination that property on which company sought to mine peat contained “waters of the United States” subject to **Clean Water Act's** (CWA) permitting requirements gave rise to direct and appreciable legal consequences, as required to constitute final agency action under Administrative Procedure Act

(APA); determination denied company a five-year safe harbor from proceedings by Corps and Environmental Protection Agency (EPA) under CWA that a negative jurisdictional determination would have provided. [U.S. Army Corps of Engineers v. Hawkes Co., Inc., U.S.2016, 136 S.Ct. 1807, 195 L.Ed.2d 77. Environmental Law 🔑 661](#)

In issuing Water Quality Certifications for natural gas pipeline expansion project that were required by the [Clean Water Act](#) (CWA), Pennsylvania Department of Environmental Protection (PADEP) acted pursuant to federal law, and thus Court of Appeals had jurisdiction under Natural Gas Act (NGA) to review PADEP's decision to issue the Certifications; although states had right to promulgate water quality standards under CWA, those standards were subject to federal oversight, the Certifications confirmed compliance with federally-established standards in addition to state requirements, and NGA provision that only excepted state action under Coastal Zone Management Act from review by Courts of Appeals suggested that action taken pursuant to CWA was subject to such review. [Delaware Riverkeeper Network v. Secretary Pennsylvania Department of Environmental Protection, C.A.3 2016, 833 F.3d 360. Environmental Law 🔑 641; Federal Courts 🔑 2286](#)

Environmental organizations and their members made good-faith allegations of continuous or intermittent violations of [Clean Water Act](#) (CWA) and Surface Mining Control and Reclamation Act (SMCRA) sufficient to confer jurisdiction over their suit against coal company; plaintiffs cited both pre- and post-complaint measurements that provided a basis for the allegation that company's discharges into stream were causing a violation of the selenium water quality standard in violation of its permit. [Ohio Valley Environmental Coalition, Inc. v. Marfork Coal Co., Inc., S.D.W.Va.2013, 966 F.Supp.2d 667. Environmental Law 🔑 214](#)

Any wetlands on landowner's property were within the [Clean Water Act](#) (CWA) jurisdiction of the Army Corps of Engineers (Corps), where Corps found that the wetlands on the site had a continuous surface connection with Lake Superior, a traditionally navigable water, and that the wetlands possessed the requisite nexus to navigable-in-fact waters because, in combination with similarly situated wetlands, they significantly affected the chemical, physical, and biological integrity of Lake Superior, and landowner presented no evidence to dispute the Corps' jurisdiction. [U.S. v. Huseby, D.Minn.2012, 862 F.Supp.2d 951. Environmental Law 🔑 128](#)

[Clean Water Act](#) (CWA) extended federal jurisdiction over groundwater that was hydrologically connected to surface waters that were themselves waters of United States, for purposes of petroleum company's contention that suing property owners and residents were not entitled to jury trial, stemming from underground storage tank (UST) leaks, due to lack of applicable civil penalties; factual determination was to be made as to relationship between groundwater below service station and surface waters of river. [Hernandez v. Esso Standard Oil Co. \(Puerto Rico\), D.Puerto Rico 2009, 599 F.Supp.2d 175. Jury 🔑 14\(1\)](#)

Under the significant nexus test as defined by Justice Kennedy in his concurrence in *Rapanos v. United States*, party seeking to invoke jurisdiction under the [Clean Water Act](#) (CWA) must present evidence that the wetlands in question possess a significant nexus to waters that are or were navigable in fact or that could reasonably be so made. [U.S. v. Cundiff, W.D.Ky.2007, 480 F.Supp.2d 940, affirmed 555 F.3d 200, certiorari denied 130 S.Ct. 74, 558 U.S. 818, 175 L.Ed.2d 27. Environmental Law 🔑 128](#)

District court had jurisdiction over claim alleging unpermitted discharges of pollutants in violation of [Clean Water Act](#). [Sierra Club v. Colorado Refining Co., D.Colo.1993, 838 F.Supp. 1428. Environmental Law 🔑 641](#)

Environmental Protection Agency (EPA) had nondiscretionary duty to review its effluent limitation guideline (ELG) for steam electric power point sources, and thus district court had subject matter jurisdiction under [Clean Water Act](#) (CWA) over citizen suit to compel EPA to revise regulations governing wastewater discharges from steam electric power plants, even though EPA had discretion as to substance of its ultimate decision, where EPA had statutory obligation to review effluent guidelines annually and limitations every five years for possible revision, and EPA had not completed

review of effluent limitations and ELGs for over quarter-century. [Defenders of Wildlife v. Jackson](#), D.D.C.2012, 284 F.R.D. 1, affirmed in part, appeal dismissed in part 714 F.3d 1317, 404 U.S.App.D.C. 395. [Environmental Law](#) 🔑 186; [Environmental Law](#) 🔑 226

Court of Federal Claims lacked jurisdiction over landowner's claim that 220.85 acres were illegally exacted by the government when landowner was required to dedicate those acres as a wetland and wildlife habitat pursuant to [Clean Water Act](#) permit, because the Army Corps of Engineers violated appropriations act by expending funds for wetland delineation based upon 1989 manual; although appropriations act might have been violated through the expenditure of the funds, it was not through that specific misapplication of the statute that the property was “exacted” from the landowner. [Norman v. U.S.](#), Fed.Cl.2003, 56 Fed.Cl. 255, affirmed 429 F.3d 1081, certiorari denied 126 S.Ct. 2288, 547 U.S. 1147, 164 L.Ed.2d 813. [United States](#) 🔑 1010

Ripeness

Neighborhood association's claim that Army Corps of Engineers was currently violating effluent standard or limitation under [Clean Water Act](#) (CWA) as result of its discharge of dredged or fill material in connection with proposed canal lock replacement project was not ripe for adjudication, where there were currently no funds allocated to construction of Corps' lock project, effectively preventing Corps from any discharging for at least seven years. [Holy Cross Neighborhood Ass'n v. U.S. Army Corps of Engineers](#), E.D.La.2011, 774 F.Supp.2d 806. [Environmental Law](#) 🔑 662

Landowners' motion for preliminary injunction to enjoin potential future prosecution for [Clean Water Act](#) violations did not present “case or controversy” under Article III, as their claims were based on contingent future events and were thus not “ripe”; there was no certainty that government would bring enforcement action, that Department of Justice would authorize criminal proceedings, or that grand jury would return indictment against landowners. [Hartford Associates v. U.S.](#), D.N.J.1992, 792 F.Supp. 358, appeal dismissed 981 F.2d 1247. [Federal Courts](#) 🔑 2165; [Federal Courts](#) 🔑 2177

Persons liable--Generally

Environmental Protection Agency (EPA) lacked authority to issue regulation providing that animal feeding operations (CAFO) could be held liable for failing to apply for National Pollutant Discharge Elimination System (NPDES) permits pursuant to [Clean Water Act](#) (CWA), inasmuch as CWA's list of situations in which EPA could impose liability did not include liability for failing to apply for NPDES permit, and CWA clearly articulated that only certain violations of CWA could be enforced using CWA's penalty provision. [National Pork Producers Council v. U.S. E.P.A.](#), C.A.5 2011, 635 F.3d 738. [Environmental Law](#) 🔑 206

Even if compliance with Johnston Amendment is prerequisite to indictment for [Clean Water Act](#) violations and even if Army Corps of Engineers failed to comply, landowners could only raise noncompliance as defense to any indictment which government might secure; such noncompliance would not preclude government from pursuing enforcement action. [Hartford Associates v. U.S.](#), D.N.J.1992, 792 F.Supp. 358, appeal dismissed 981 F.2d 1247. [Environmental Law](#) 🔑 743

National Pollutant Discharge Elimination System (NPDES) permit holder's failure to include results of monitoring of particular pollutants in its monthly discharge monitoring reports violated the terms of its consent decree with state environmental agency, and thus violated the [Clean Water Act](#); there was no indication that state agency agreed to permit holder's request for modification of permit. [Natural Resources Defense Council, Inc. v. Loewengart & Co., Inc.](#), M.D.Pa.1991, 776 F.Supp. 996. [Federal Civil Procedure](#) 🔑 2397.6

Owner of private septic system, providing service to residential development, was liable under **Clean Water Act** for discharge of raw sewage into river caused by failure of system. *Friends of Sakonnet v. Dutra*, D.R.I.1990, 738 F.Supp. 623. [Environmental Law](#) 🔑 206

Municipal owner-operator of sewage treatment work was liable under **Clean Water Act** for violations of National Pollutant Discharge Elimination permit effluent limitations that were established through copies of discharge monitoring reports filed by municipality. *U.S. v. City of Hoboken*, D.N.J.1987, 675 F.Supp. 189. [Environmental Law](#) 🔑 206

---- **Causation, persons liable**

Control of bond forfeiture mining sites by West Virginia Department of Environmental Protection, and responsibility for discharge of acid mine drainage therein, was sufficient to establish that discharge or addition of pollutants to waters was “caused” by Department, as required to establish a violation of National Pollutant Discharge Elimination System (NPDES) permit requirement under **Clean Water Act** (CWA), even though Department was not the owner of the property upon which the sites were located and had not reaped any benefit from use thereof. *West Virginia Highlands Conservancy, Inc. v. Huffman*, S.D.W.Va.2009, 651 F.Supp.2d 512. [Environmental Law](#) 🔑 206

---- **Control over operations, persons liable**

County was not “discharger” of pollution into waters of United States, and could not be held liable under **Clean Water Act** (CWA), for stormwater runoff from state highway owned, maintained, operated, and controlled by state. *Jones v. E.R. Snell Contractor, Inc.*, N.D.Ga.2004, 333 F.Supp.2d 1344, affirmed 120 Fed.Appx. 786, 2004 WL 2157261, certiorari denied 125 S.Ct. 1735, 544 U.S. 962, 161 L.Ed.2d 603. [Environmental Law](#) 🔑 226

Manager of wastewater treatment facility exercised sufficient actual control over operations of facility and had sufficient personal involvement in decision to discharge effluent into Mississippi sound to be individually liable for **Clean Water Act** (CWA) violations; manager held himself out as being in ultimate control, corresponded with authorities and attended meetings and hearings on behalf of facility, and signed letters to gulf coast authority regarding facility's compliance with court orders. *U.S. v. Gulf Park Water Co., Inc.*, S.D.Miss.1997, 972 F.Supp. 1056. [Corporations And Business Organizations](#) 🔑 1970

Chapter 12 debtors, who purchased llama ranch on which pond had been constructed, were not liable for **Clean Water Act** (CWA) violations allegedly committed in conjunction with construction of pond by dredging slough and deposit of dredge materials near banks of wetland, as they did not own land when pond was constructed, they did not order the work done or pay for the work, they did not specify how, when, or where the work would be done, they did not select who would do the work, and they did not provide plans for the work. *In re Carsten*, Bkrtcy.D.Mont.1997, 211 B.R. 719. [Environmental Law](#) 🔑 136

---- **Estate of violator, persons liable**

Cause of action for violation of **Clean Water Act** (CWA) and Rivers and Harbors Act (RHA), to extent injunctive relief is sought, survives death of violator and may be maintained against violator's estate, though civil penalties do not survive violator's death. *U.S. v. Lambert*, S.D.W.Va.1996, 915 F.Supp. 797. [Abatement And Revival](#) 🔑 55(1)

---- **Individual, persons liable**

Public utility director, as an “individual,” was a “person” subject to criminal liability under the **Clean Water Act** for violation of national pollutant discharge elimination system permit. [U.S. v. Brittain, C.A.10 \(Okla.\) 1991, 931 F.2d 1413. Environmental Law 🔑 743](#)

---- Intent to pollute, persons liable

With exception of purely jurisdictional elements, mens rea of knowledge applies to each element of **Clean Water Act** (CWA) offenses of knowingly discharging pollutant from point source into navigable water of United States without permit, and knowingly operating source in violation of pretreatment standard; those CWA violations do not fall into judicially created exception for “public welfare offenses,” under which some regulatory crimes do not require showing of mens rea. [U.S. v. Ahmad, C.A.5 \(Tex.\) 1996, 101 F.3d 386, rehearing and suggestion for rehearing en banc denied 108 F.3d 335. Environmental Law 🔑 743](#)

Facility operator's statements in notice of intent (NOI) and storm water pollution prevention plan (SWPPP) documents, which were submitted to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage, could not serve as sole basis for holding operator liable under **Clean Water Act** (CWA) for unpermitted point source discharges. [Environmental Protection Information Center v. Pacific Lumber Co., N.D.Cal.2006, 430 F.Supp.2d 996. Environmental Law 🔑 230](#)

Clean Water Act (CWA) imposes strict liability for violation of permit requirement for discharge of dredged or fill material into navigable waters; “no discharge” provision was written without regard to intentionality, making person responsible for discharge of any pollutant strictly liable. [U.S. v. Lambert, S.D.W.Va.1996, 915 F.Supp. 797. Environmental Law 🔑 136; Environmental Law 🔑 206](#)

Persons entitled to sue

Trade associations representing businesses in the housing and construction fields did not have Article III standing to bring action to seek declaration that designation by Environmental Protection Agency (EPA) and United States Army Corps of Engineers of two reaches of Santa Cruz River in Arizona as traditional navigable waters (TNW) under **Clean Water Act** (CWA) was invalid, or to set aside the determination and enjoin the Corps and EPA from relying on the TNW determination in any future jurisdictional determinations in the Santa Cruz River watershed, based on agencies' failure to provide notice and an opportunity to submit comments pursuant to the Administrative Procedure Act (APA), since neither the associations, nor their members, had suffered any concrete injury by the determination. [National Ass'n of Home Builders v. E.P.A., C.A.D.C.2011, 667 F.3d 6, 399 U.S.App.D.C. 124, rehearing en banc denied. Associations 🔑 20\(1\); Declaratory Judgment 🔑 300](#)

Environmental organization's members sufficiently alleged redressability as required for organization to have associational standing to bring action alleging that surface mine operator violated **Clean Water Act** (CWA) by discharging highly conductive water into two tributaries for a creek; relief members sought, i.e., injunction requiring operator to reduce its discharge of ionic pollution to comply with the terms of its National Pollutant Discharge Elimination System (NPDES) permit, would provide redress for members' injuries, i.e, loss of aesthetic and recreational value of creek, by reducing the amount of ionic pollution in the creek. [Ohio Valley Environmental Coalition v. Foal Coal Company, LLC, S.D.W.Va.2017, 2017 WL 1276059. Environmental Law 🔑 652](#)

Not-for-profit environmental protection organization had capacity to bring suit against trucking and excavation company and its owner, as well as owner of property directly adjacent to river, alleging that defendants violated and continued to violate **Clean Water Act** by discharging pollutants without permit issued under Act, as required to establish organization's associational standing; although organization was involuntarily dissolved when complaint was filed, plain

language of Illinois's Not for Profit Act's saving provision provided that upon organization's proper application for reinstatement, organization was revived retroactively to its dissolution date, and, even in absence of such retroactive effect, organization would qualify as voluntary unincorporated association. [Quad Cities Waterkeeper v. Ballegeer](#), C.D.Ill.2015, 84 F.Supp.3d 848, clarified 2015 WL 6541181. [Environmental Law](#) 🔑 652

Association representing herring fishermen adequately alleged redressable injuries to its members, as required for association's Article III standing to bring action against former owner-operator of defunct manufactured gas plants for violation of [Clean Water Act](#) (CWA) as result of alleged hazardous waste from plants that continued to contaminate bay; association sought injunction to compel owner-operator to remediate hazardous waste that allegedly continued to endanger bay's herring population on which fishermen's livelihoods depended. [San Francisco Herring Association v. Pacific Gas and Electric Company](#), N.D.Cal.2015, 81 F.Supp.3d 847. [Environmental Law](#) 🔑 652

Non-profit environmental and human health organization sufficiently alleged that an individual member suffered an injury in fact, as required for organization to establish standing to bring suit, on behalf of its members, against farm operator, alleging operator's pollutant discharges to publicly owned treatment works (POTW) exceeded the limitations imposed in its state waste discharge permit, in violation of the [Clean Water Act](#) (CWA); complaint alleged that member utilized the river near POTW for spiritual renewal, recreation, and aesthetic enjoyment, that she would like to use river more often and for wider range of activities but did not do so because of the presence of pollutants, and that her enjoyment of the river was diminished as a result of the alleged pollution. [Waste Action Project v. Draper Valley Holdings LLC](#), W.D.Wash.2014, 49 F.Supp.3d 799. [Environmental Law](#) 🔑 652

In environmental organizations' action against landowner for alleged discharges of selenium from its property into tributary without a permit in violation of [Clean Water Act](#) (CWA), allegations that at least one member visited tributary in the past, planned to visit it in the future, enjoyed it less based on her knowledge of the discharges, and refrained from bringing her grandchildren to the affected waters were sufficient to allege an injury-in-fact, as required to have Article III standing. [Ohio Valley Environmental Coalition, Inc. v. Hernshaw Partners, LLC](#), S.D.W.Va.2013, 984 F.Supp.2d 589. [Environmental Law](#) 🔑 652

Individual and organizational plaintiffs lacked standing to bring claims against owners of mobile offshore drilling unit and related defendants alleging violations of [Clean Water Act](#) (CWA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act, and Endangered Species Act (ESA) arising out of explosion, fire and capsizing of unit, where oil well in Atlantic Ocean had been capped, the flow of oil from well had been stopped, and what remained of mobile offshore drilling unit was on the ocean floor, meaning there was no benefit to be achieved by entry of requested injunctive relief; defendants, as well as agencies comprising "Unified Area Command" had been and continued to assist in cleaning up Gulf, and as numerous entities not before court were assisting in cleanup efforts, any order from court was not guaranteed to resolve any potential deficiency in cleanup efforts. [In re Oil Spill by Oil Rig Deepwater Horizon](#), E.D.La.2011, 792 F.Supp.2d 926, affirmed in part, reversed in part 704 F.3d 413. [Environmental Law](#) 🔑 652; [Environmental Law](#) 🔑 656

Surrounding residents lacked standing to assert claim that pesticide formulations facility operator violated [Clean Water Act](#) (CWA) by discharging contaminated wastewater into municipal storm sewer without state pollutant discharge elimination system (SPDES) or national pollutant discharge elimination system (NPDES) permit, where one area had been fully remediated, and residents failed to present any evidence to support causal connection between chemical exposure and any medical complaint, evidence that discharges flowed through or onto their properties, or expert evidence that their property values were adversely affected by their proximity to facility. [Lewis v. FMC Corp.](#), W.D.N.Y.2011, 786 F.Supp.2d 690. [Environmental Law](#) 🔑 656

Army Corps of Engineers was acting in its administrative capacity in connection with project to replace canal lock, and thus neighborhood association's suit alleging that dredging activities in connection with project would violate effluent

standard or limitation did not fall within scope of **Clean Water Act's** (CWA) citizen suit provision, where Corps was not actually discharging at present time or in near future because it lacked funds to do so. [Holy Cross Neighborhood Ass'n v. U.S. Army Corps of Engineers](#), E.D.La.2011, 774 F.Supp.2d 806. [Environmental Law](#) 🔑 146

Members of shellfish growers and environmental associations adequately alleged injury in fact, resulting from coastal landowners' alleged actions of violating the **Clean Water Act** (CWA) and contaminating shellfish beds and surrounding waters with their ditching activities, so as to support finding that associations had representational standing to maintain suit under CWA; members alleged they used area at issue, and that their recreational, aesthetic, and economic interests in area had been impaired or threatened as result of landowners' ditching activities. [North Carolina Shellfish Growers Ass'n v. Holly Ridge Associates, LLC.](#), E.D.N.C.2003, 278 F.Supp.2d 654, 357 N.C. 1429. [Environmental Law](#) 🔑 652

Non-profit sport fishing associations had standing under **Clean Water Act** (CWA) to bring suit on behalf of their members for damages arising from city's use of tunnel to transfer drinking water from reservoir into trout stream without discharge permit; members of each association testified that discharge had interfered with their enjoyment of fishing creek, both aesthetically and in their ability to fish safely, and decision in associations' favor, requiring city to reduce turbidity of water flowing through tunnel, would redress their injuries. [Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York](#), N.D.N.Y.2003, 244 F.Supp.2d 41, affirmed in part and remanded 451 F.3d 77, certiorari denied 127 S.Ct. 1373, 549 U.S. 1252, 167 L.Ed.2d 160. [Environmental Law](#) 🔑 652

Citizen plaintiffs under **Clean Water Act** (CWA) lacked standing to enforce receiving water quality limitations included in national pollutant discharge elimination system (NPDES) permits which had not been translated into end-of-pipe effluent limitations, even though permits contained specific water quality standards imposing “quantitative,” rather than “narrative,” conditions, and explicitly allowed dischargers to escape liability for violations caused by others. [Save Our Bays and Beaches v. City and County of Honolulu](#), D.Hawai'i 1994, 904 F.Supp. 1098. [Environmental Law](#) 🔑 656

Limitations

Where alleged violation of **Clean Water Act** (CWA), which was premised on discharge of polluted water without permit, had not ceased before filing of initial complaint but had ceased at time of amendment, amended complaint related back, for purpose of associational standing inquiry, to date of initial complaint. [Building and Const. Trades Council of Buffalo, New York and Vicinity v. Downtown Development, Inc.](#), C.A.2 (N.Y.) 2006, 448 F.3d 138. [Environmental Law](#) 🔑 652

Discharges from surface mine exceeded West Virginia's chronic selenium limitation incorporated into mine operator's national pollutant discharge elimination system (NPDES) permit, in violation of **Clean Water Act** (CWA), where all samples taken over six-day period exceeded state's chronic selenium limitation. [Ohio Valley Environmental Coalition, Inc. v. Alex Energy, Inc.](#), S.D.W.Va.2014, 2014 WL 3687741. [Environmental Law](#) 🔑 206

Intervention

Trial court erred in denying citizens leave to intervene in Environmental Protection Agency's (EPA's) **Clean Water Act** action since Act expressly provides for intervention as of right; however, error was harmless inasmuch as commencing enforcement action was discretionary rather than mandatory duty in the first instance and hence, ultimately settling action also was within EPA's discretion. [U.S. E.P.A. v. City of Green Forest, Ark.](#), C.A.8 (Ark.) 1990, 921 F.2d 1394, rehearing denied, certiorari denied 112 S.Ct. 414, 502 U.S. 956, 116 L.Ed.2d 435. [Environmental Law](#) 🔑 657; [Environmental Law](#) 🔑 690

Complaint

Environmental organizations' allegation that landowner discharged selenium into unnamed tributary and that it was a water of the United States was sufficient to allege discharge into navigable water, as required to state a claim against landowner for violation of **Clean Water Act** (CWA) provision prohibiting discharge of pollutants without a permit. [Ohio Valley Environmental Coalition, Inc. v. Hernshaw Partners, LLC, S.D.W.Va.2013, 984 F.Supp.2d 589. Environmental Law 🔑 196; Environmental Law 🔑 206](#)

Allegations of poultry integrator's control over grower's concentrated animal feeding operation (CAFO) were sufficient to state claim against integrator for liability for alleged illegal discharges under the **Clean Water Act** (CWA); plaintiffs alleged that integrator owned the chickens and provided all of the feed, fuel, litter, medications, vaccinations and other supplies necessary for the CAFO to grow the chickens, and that integrator dictated the aspects of care for the chickens such as the type of buildings, equipment, and other facilities used in the operation, and makes periodic site visits to ensure compliance with its dictates. [Assateague Coastkeeper v. Alan and Kristin Hudson Farm, D.Md.2010, 727 F.Supp.2d 433. Environmental Law 🔑 206](#)

Complaint, which alleged that the discharge of stormwater runoff at development violated the applicable State Pollution Discharge Elimination System (SPDES) permit because it causes the turbidity of adjacent reservoir to rise above permissible levels and that defendants were in violation of their SPDES permit because the stormwater pollution prevention plan (SWPPP) for the development failed to comply with current erosion and sediment control design requirements, adequately alleged **Clean Water Act** (CWA) violations. [City of Newburgh v. Sarna, S.D.N.Y.2010, 690 F.Supp.2d 136, affirmed in part, appeal dismissed in part 406 Fed.Appx. 557, 2011 WL 181519. Environmental Law 🔑 226](#)

Environmental organizations alleging that solid waste, wrecked or discarded equipment, garbage, rock, sand, and dirt were and continued to be discharged from abandoned construction site into creek, which was tributary of navigable waterway, without any permit stated valid cause of action under the **Clean Water Act** against owners of site. [Hudson River Fishermen's Ass'n v. Arcuri, S.D.N.Y.1994, 862 F.Supp. 73. Environmental Law 🔑 196](#)

Pleadings

Owner of riverfront property sufficiently alleged that ships stored at an alleged unlicensed pier facility were associated with an industrial activity, and that the ships took on water that then became contaminated from chemicals in the ships before flowing into the river as stormwater runoff, as required to state claim for unauthorized "point source" pollution under the **Clean Water Act** (CWA). [307 Campostella, LLC v. Mullane, E.D.Va.2015, 143 F.Supp.3d 407. Environmental Law 🔑 196](#)

Striking expert affidavits offered in rebuttal by trucking and excavation company and its owner, as well as owner of property directly adjacent to river, was warranted in not-for-profit environmental protection organizations' suit alleging that they violated **Clean Water Act** by discharging pollutants into river without permit issued under Act, absent any substantial justification for failure to timely submit this rebuttal evidence prior to discovery deadline or any explanation as to how this failure was harmless to organizations. [Quad Cities Waterkeeper v. Ballegeer, C.D.Ill.2015, 84 F.Supp.3d 848, clarified 2015 WL 6541181. Federal Civil Procedure 🔑 1278](#)

Association representing herring fishermen and resident whose home was on former site of long-defunct manufactured gas plant adequately alleged ongoing violation of **Clean Water Act** (CWA), as required to state claim against former owner-operator of plants that allegedly left behind hazardous waste that contaminated bay; waste in soil of plant sites allegedly was continually discharged into bay, and owner-operator's alleged refusal to test for contaminants in groundwater that served as conduit meant sites would continue to endanger environment. [San Francisco Herring Association v. Pacific Gas and Electric Company, N.D.Cal.2015, 81 F.Supp.3d 847. Environmental Law 🔑 226](#)

Allegation by nursery and its owner that they lost crop after they complied with cease and desist order issued by Army Corps of Engineer pursuant to **Clean Water Act** that they reasonably believed they were not free to ignore was sufficient to state plausible claim that they were deprived of property without due process of law, even if order imposed no legal obligations or liability on its own. [Duarte Nursery, Inc. v. U.S. Army Corps of Engineers, E.D.Cal.2014, 17 F.Supp.3d 1013](#). [Constitutional Law](#) 🔑 4269; [Constitutional Law](#) 🔑 4323; [Environmental Law](#) 🔑 211

Notice

Environmental advocacy group's notice-of-intent-to-sue letter sent to operator of marine bulk terminal to alert it of violations of state and federal regulations governing storm water discharge as to vehicle maintenance and equipment cleaning operations was adequate, under standards set forth under **Clean Water Act**, and thus, court had jurisdiction to hear group's enforcement action against operator, where the 20-page notice letter described the activities at operator's facility as to vehicle maintenance and rail car maintenance, detailed which activities occurred in each part of the facility, described the storm water conveyance system and discharge location, and stated that storm water discharges from the facility violated permit regulations "during and/or following every significant rain event." [San Francisco Baykeeper v. Levin Enterprises, Inc., N.D.Cal.2013, 12 F.Supp.3d 1208](#). [Environmental Law](#) 🔑 659

Sufficiency of notice

Although environmental advocacy group's notice-of-intent-to-sue letter sent to operator of marine bulk terminal to alert it of violations of state and federal regulations governing storm water discharge as to vehicle maintenance and equipment cleaning operations was adequate, under standards set forth under **Clean Water Act**, it failed to provide notice as to alleged commingling of discharges from permit-covered activities with those from activities where no permit coverage was required, and thus court lacked jurisdiction as to this claim in enforcement action; although notice letter included a list of pollutants, discharge points, and sources of pollution that related to discharges of storm water and non-storm water from the facility, there was no mention of the word commingling or the idea that discharges from covered activities were mixed with non-covered activities so as to alert operator of the alleged violation. [San Francisco Baykeeper v. Levin Enterprises, Inc., N.D.Cal.2013, 12 F.Supp.3d 1208](#). [Environmental Law](#) 🔑 659

Stay

District court would not stay environmental organizations' action against county alleging that county violated the **Clean Water Act** (CWA) by discharging effluent, without a National Pollutant Discharge Elimination System (NPDES) permit, at four injection wells, to give Hawaii's Department of Health and the Environmental Protection Agency opportunity to consider need for a permit in the first instance; there was no discernible harm in proceeding with litigation while agencies considered county's permit application, since if court required permit, agencies could not supersede court's decision by determining that permit was not required, and if agencies required permit, that did not render entire case moot, because county could still be liable for payment of civil penalties, and further delay would result in continued alleged discharge of pollutants into the ocean. [Hawai'i Wildlife Fund v. County of Maui, D.Hawai'i 2014, 24 F.Supp.3d 980](#), motion to certify appeal denied [2015 WL 1608430](#). [Environmental Law](#) 🔑 697

Conformance

Federal Energy Regulatory Commission's (FERC) verification of licensee's compliance with license terms for operation of hydroelectric project, pursuant to Federal Power Act (FPA) requirements of monitoring and investigating license compliance, fulfilled FERC's duties related to **Clean Water Act** (CWA) by verifying that licensee had confirmed that property developer secured necessary permits, under CWA, before allowing construction of wastewater discharge pipe

and seawall on project property. [Duncan's Point Lot Owners Ass'n Inc. v. F.E.R.C.](#), C.A.D.C.2008, 522 F.3d 371, 380 U.S.App.D.C. 346. [Environmental Law](#) 🔑 196

Environmental Protection Agency's (EPA's) approval of provision of Kentucky's water quality antidegradation rules under the [Clean Water Act](#) (CWA), pursuant to which coal mining discharges were subject to regulation under the Surface Mining Control and Reclamation Act (SMCRA), and were not subject to antidegradation review, was not arbitrary and capricious, where Kentucky procedure for approving coal mining discharge permits was consistent with language of the CWA, and the Court agrees with the EPA. [Kentucky Waterways Alliance v. Johnson](#), W.D.Ky.2006, 426 F.Supp.2d 612, affirmed in part, reversed in part and remanded 540 F.3d 466, rehearing denied. [Environmental Law](#) 🔑 196

Consent decree

Consent decree entered into between water reclamation district and federal and state agencies, requiring district to complete project to impound and control water overflow caused by heavy rainfall until it could be cleaned up and released safely, had reasonable prospect of success, and therefore, demonstrated diligent prosecution to bring district in compliance with Environmental Protection Agency (EPA) standards, such that private citizens groups were precluded from bringing separate lawsuit alleging that district's proposed plan violated [Clean Water Act](#); consent decree was reasonable in light of current infrastructure, cost of doing things differently, and limits of knowledge about what would happen when the system was completed, and as such, had binding effect on would-be private litigants. [U.S. v. Metropolitan Water Reclamation Dist. of Greater Chicago](#), C.A.7 (Ill.) 2015, 792 F.3d 821. [Environmental Law](#) 🔑 226

Estoppel

Operators of sewage facility acted unreasonably under estoppel doctrine by assuming that they had obtained an extension from Louisiana Department of Environmental Quality (LDEQ) of their permit to discharge pollutants into surrounding waters, pursuant to [Clean Waters Act](#) (CWA), in absence of LDEQ communication to that effect, thus precluding estoppel defense in environmental organization's citizen suit for discharging pollutants without permit, even if operators were permitted to assert that defense; operators filed application for permit renewal outside 180-day deadline imposed by plain language of Louisiana statute, of which LDEQ specifically informed operators. [Louisiana Environmental Action Network v. LWC Management Co. Inc.](#), W.D.La.2007, 619 F.Supp.2d 258. [Environmental Law](#) 🔑 208

Summary judgment

Genuine issue of material fact existed as to whether there was continuing likelihood of recurrence in intermittent or sporadic violations of [Clean Water Act](#) (CWA) even if construction on dairy operation had ceased and erosion control measures were in place, precluding summary judgment on issue of whether dairy operation illegally undertook facility construction without required National Pollutant Discharge Elimination System (NPDES) permit. [Friends of Maha'ulepu, Inc. v. Hawai'i Dairy Farms, LLC](#), D.Hawai'i 2016, 224 F.Supp.3d 1094. [Evidence](#) 🔑 43(1); [Federal Civil Procedure](#) 🔑 2545

Genuine issue of material fact existed as to whether alleged modification of original fill design by trucking and excavation company and its owner, as well as owner of property directly adjacent to river, changed character, scope, or size of that design, and thus whether their activities were precluded from [Clean Water Act's](#) maintenance of dikes exception, precluding summary judgment on not-for-profit environmental protection organizations' claim alleging that defendants' activities violated Act by discharging pollutants without permit issued under Act. [Quad Cities Waterkeeper v. Ballegeer](#), C.D.Ill.2015, 84 F.Supp.3d 848, clarified 2015 WL 6541181. [Federal Civil Procedure](#) 🔑 2498.3

Genuine issue of material fact existed as to whether area of creek that property owner filled was previously subject to farming and whether recapture provision of **Clean Water Act** applied to owner's conduct, precluding summary judgment in government's action against owner under the Act for allegedly discharging fill material into creek without a permit. [U.S. v. Hamilton, D.Wyo.2013, 952 F.Supp.2d 1271. Federal Civil Procedure 🔑 2498.3](#)

Genuine issue of material fact existed regarding whether scrap metal recycling and processing facility's Storm Water Pollution Prevention Plan (SWPPP) included best management practices that achieved best available technology economically achievable for toxic and non-conventional pollutants and best conventional pollutant control technology for conventional pollutants, and thus violated limitation in California's General Industrial Permit, precluding summary judgment on non-profit corporation's **Clean Water Act** claims against facility owner. [Santa Monica Baykeeper v. International Metals Ekco, Ltd., C.D.Cal.2009, 619 F.Supp.2d 936. Federal Civil Procedure 🔑 2498.3](#)

Burden of proof

Clean Water Act does not establish a prescribed statutory maximum penalty in prosecution for discharging a pollutant without a permit in violation of Act, and thus, number of days on which Act was violated, which is a sentencing factor under Act, is not required under *Apprendi* to be proven beyond a reasonable doubt. [U.S. v. Chemetco, Inc., C.A.7 \(Ill.\) 2001, 274 F.3d 1154. Environmental Law 🔑 761; Sentencing And Punishment 🔑 322.5](#)

Environmental organization did not have to prove that manufacturing company's stormwater contained any particular substance or particular quantity of a pollutant in order to establish a violation of **Clean Water Act** (CWA) provision prohibiting discharge of any pollutant into waters of the United States except in compliance with CWA, in its action against manufacturing company, even though such proof was generally required to establish a violation of discharge prohibition; Congress, in enacting CWA provision regarding municipal and industrial stormwater discharges, determined that all stormwater discharges associated with industrial activity were pollutants that required a permit. [Puget Soundkeeper Alliance v. Whitley Mfg. Co., Inc., W.D.Wash.2015, 145 F.Supp.3d 1054. Environmental Law 🔑 196](#)

To establish violation of the **Clean Water Act**, the United States need only show that: it has jurisdiction over the subject waters; defendants discharged or placed fill in those waters; and defendants did so without a permit from the Army Corps of Engineers. [U.S. v. Zanger, N.D.Cal.1991, 767 F.Supp. 1030. Environmental Law 🔑 136](#)

Civil penalty

Discharging fill material without a permit under **Clean Water Act** (CWA) while risking an enforcement action during which peat mining company could argue that no permit was required was not an adequate alternative to judicial review of Army Corps of Engineers' revised jurisdictional determination that property on which company sought to mine peat contained "waters of the United States" subject to CWA's permitting requirements; discharging material under mistaken belief that property did not contain jurisdictional waters would expose company to civil penalties of up to \$37,500 for each day that it violated CWA, in addition to potential criminal liability. [U.S. Army Corps of Engineers v. Hawkes Co., Inc., U.S.2016, 136 S.Ct. 1807, 195 L.Ed.2d 77. Environmental Law 🔑 641](#)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) precluded federal subject matter jurisdiction over property owner's claims against owner of open-pit sulfur mine seeking civil penalties of up to \$37,500 per day for **Clean Water Act** (CWA) violations allegedly occurring for over 40 years; civil penalties had potential to interfere with ongoing cleanup because it could affect property owner's ability and willingness to perform necessary cleanup, and property owner would likely face higher penalties even if it attempted to comply with CWA's permitting scheme. [Diamond X Ranch, LLC v. Atlantic Richfield Co., D.Nev.2014, 51 F.Supp.3d 1015, reconsideration denied 2015 WL 4874558. Environmental Law 🔑 645](#)

Injunction

Injunctive relief was unnecessary to prevent any alleged ongoing or future **Clean Water Act** (CWA) violations resulting from county's application of mosquito control pesticides in compliance with Environmental Protection Agency (EPA) guidance and final rule, the vacatur of which had been stayed; stay of vacatur maintained status quo, which was that pesticide application consistent with Environmental Protection Agency (EPA) approved Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) labeling did not necessitate a CWA permit, and EPA had expressed intent to establish a nationwide permitting process before stay expired. *Peconic Baykeeper, Inc. v. Suffolk County*, C.A.2 (N.Y.) 2010, 600 F.3d 180. [Environmental Law](#) 🔑 700

Preliminary injunction against construction was warranted in environmental organization's action under **Clean Water Act** (CWA) and National Environmental Policy Act (NEPA), challenging Army Corps of Engineers' issuance of permit for private developer to construct 66 road crossings over federally owned waters as part of planned residential development in desert parcel; substantial questions existed whether Corps had applied too narrow scope of review in looking only at waters and immediately adjacent areas, since waters, though composing only five percent of parcel, were not isolated from rest of parcel but were scattered across it. *Save Our Sonoran, Inc. v. Flowers*, C.A.9 (Ariz.) 2005, 408 F.3d 1113. [Environmental Law](#) 🔑 701

Permanent injunction prohibiting developer from discharging any stormwater runoff as violation of **Clean Water Act** (CWA) was unenforceable "obey the law" injunction in absence of operative command capable of enforcement; injunction did not indicate whether developer was to stop rain from falling, build retention pond to control stormwater discharges, or construct water treatment plant. *Hughey v. JMS Development Corp.*, C.A.11 (Ga.) 1996, 78 F.3d 1523, rehearing and suggestion for rehearing en banc denied 89 F.3d 857, certiorari denied 117 S.Ct. 482, 519 U.S. 993, 136 L.Ed.2d 377. [Environmental Law](#) 🔑 700

The 1981 amendments to **Clean Water Act**, which extended time which publicly owned water treatment works had to comply with Act [Federal Water Pollution Control Act Amendments of 1972, § 301(i), as amended, 33 U.S.C.A. § 1311(i)], applied only to public works whose funding was reduced pursuant to 1981 amendments or which could not comply with Act due to changed circumstances beyond their control so that municipality which did not come within either category, and which continued to discharge pollutants into stream beyond expiration date of permits, was properly enjoined for violating Act. *Franklin Tp. Sewerage Authority v. Middlesex County Utilities Authority*, C.A.3 (N.J.) 1986, 787 F.2d 117, certiorari denied 107 S.Ct. 109, 479 U.S. 828, 93 L.Ed.2d 57. [Environmental Law](#) 🔑 700

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) precluded federal subject matter jurisdiction over property owner's claim seeking to permanently enjoin owner of open-pit sulfur mine from discharging pollutants from mine site into creeks or their upgradient tributaries; requests for injunctive relief challenged ongoing CERCLA cleanup at mine, and sought to compel compliance with **Clean Water Act** (CWA) and Nevada's Water Pollution Control Act (NWPCA). *Diamond X Ranch, LLC v. Atlantic Richfield Co.*, D.Nev.2014, 51 F.Supp.3d 1015, reconsideration denied 2015 WL 4874558. [Environmental Law](#) 🔑 645

City, which stated **Clean Water Act** (CWA), nuisance and trespass claims against developer defendants based on allegations that defendants caused the discharge of turbid stormwater into reservoir serving the city, was not entitled to preliminary injunction compelling the redesign of development's stormwater management system, including the installation of new drainage basins, weekly testing by an independent party and removal of structures from city-owned property, and prohibiting a thirteen-home expansion of the development since city failed to establish a likelihood of imminent irreparable threat to the "integrity" of the reservoir or the city's water supply; city alleged only two, apparently aberrant, incidents of improper sediment discharge in the thirteen months after completion of the redesigned sediment basins, the turbidity data, considered as a whole, was inconclusive, and city's almost decade-long delay in bringing suit

militated against a finding of irreparable harm. *City of Newburgh v. Sarna*, S.D.N.Y.2010, 690 F.Supp.2d 136, affirmed in part, appeal dismissed in part 406 Fed.Appx. 557, 2011 WL 181519. [Environmental Law](#) 🔑 701; [Injunction](#) 🔑 1264; [Nuisance](#) 🔑 80

Review of Administrator's action

Determination of the Administrator of the Environmental Protection Agency that § 301(g) of the [Clean Water Act](#) [33 U.S.C.A. § 1311(g)] does not authorize modification of categorical-pretreatment standards was not unreasonable. *Koppers Co., Inc. v. U.S. E.P.A.*, C.A.3 1985, 767 F.2d 57. [Environmental Law](#) 🔑 682

The decision of the Army Corps of Engineers to issue a permit to fill in wetland area for the extension of railroad line was the result of a reasonable judgment made with sufficient information, as required by the [Clean Water Act](#) (CWA), even though the Corps' Final Environmental Impact Statement (Final EIS) adopted the findings of the railroad's modified functional assessment that the areas to be filled were of low or moderately functioning wetland rather than high functioning wetland as indicated by a prior assessment, and the Environmental Protection Agency (EPA) and Fish and Wildlife Service (FWS) criticized the Final FEIS, where the Corps addressed the other agencies' concerns and explained that modification of the assessment was necessary to produce accurate results, since the original assessment was created for a different type of wetland. *Cook Inletkeeper v. U.S. Army Corps of Engineers*, D.Alaska 2014, 22 F.Supp.3d 1010. [Environmental Law](#) 🔑 136

Exception to the general rule against judicial consideration of interlocutory agency rulings under Administrative Procedure Act (APA) did not apply to challenge of Environmental Protection Agency's (EPA) failure to revise vessel general permit to include more stringent conditions, where EPA had yet to take any action modifying discharge permits under [Clean Water Act](#) (CWA) and was not required to take a certain action until some point in the future. *National Wildlife Federation v. U.S. E.P.A.*, D.D.C.2013, 945 F.Supp.2d 39. [Environmental Law](#) 🔑 661

Review

Army Corps of Engineers' revised jurisdictional determination that property on which company sought to mine peat contained "waters of the United States" subject to [Clean Water Act's](#) (CWA) permitting requirements marked consummation of Corps' decisionmaking process, as required to constitute final agency action under Administrative Procedure Act (APA); determination was issued after extensive factfinding regarding physical and hydrological characteristics of property, Corps ruled definitively that property contained jurisdictional waters by issuing an approved jurisdictional determination, and revision of Corps' approved determination based on new information did not make it otherwise definitive decision non-final. *U.S. Army Corps of Engineers v. Hawkes Co., Inc.*, U.S.2016, 136 S.Ct. 1807, 195 L.Ed.2d 77. [Environmental Law](#) 🔑 661

At bench trial in property owner's civil enforcement action under [Clean Water Act](#) (CWA) against neighboring business, district court's conclusion that property owner failed to show that business's stormwater system was emitting pollutants was not clearly erroneous; report of owner's expert significantly misapprehended stormwater system's components and their functions, and all samples came from mingled water source, not directly from business's property. *Paolino v. JF Realty, LLC*, C.A.1 (R.I.) 2016, 830 F.3d 8, certiorari denied 137 S.Ct. 2093, 197 L.Ed.2d 894. [Environmental Law](#) 🔑 226

Remand

Because district court did not explain the basis for its conclusion that all of county's mosquito control spraying, including spraying that occurred above water, was in compliance with Federal Insecticide, Fungicide and Rodenticide

Act (FIFRA) label, and thus in compliance with **Clean Water Act** (CWA), Court of Appeals would vacate and remand judgment of the district court insofar as it held that the county's spraying activities were uniformly in compliance with the FIFRA requirements; although record indicated that application of pesticides was, in the main, consistent with EPA-approved FIFRA label, it also revealed instances of aerial spraying over creeks, and district court did not adequately explain the basis for its finding that such spraying complied with the pesticides' label instructions. [Peconic Baykeeper, Inc. v. Suffolk County, C.A.2 \(N.Y.\) 2010, 600 F.3d 180. Environmental Law 🔑 709](#)

Penalty

Deferred penalty of \$50,000 was warranted in environmental organization's citizen suit alleging that auto wrecking, recycling, and storage facility operator violated **Clean Water Act** (CWA) by failing to comply with terms and conditions of its National Pollutant Discharge Elimination System (NPDES) permits, even though operator committed roughly 4,015 CWA violations, totaling upwards of \$150 million in fines, where large penalty would only hamper operator's efforts to comply with stipulated injunctive relief, and most likely put it out of business. [Waste Action Project v. Astro Auto Wrecking, LLC, W.D.Wash.2017, 2017 WL 1229186. Environmental Law 🔑 223](#)

Footnotes

- 1 So in original. Probably should be “than”.
 - 2 So in original. Probably should be “contractual”.
- 33 U.S.C.A. § 1311, 33 USCA § 1311
Current through P.L. 115-68.

ATTACHMENT 2



KeyCite Yellow Flag - Negative Treatment

Proposed Legislation

[United States Code Annotated](#)

[Title 33. Navigation and Navigable Waters \(Refs & Annos\)](#)

[Chapter 26. Water Pollution Prevention and Control \(Refs & Annos\)](#)

[Subchapter V. General Provisions](#)

33 U.S.C.A. § 1362

§ 1362. Definitions

Effective: October 1, 2014

[Currentness](#)

Except as otherwise specifically provided, when used in this chapter:

(1) The term “State water pollution control agency” means the State agency designated by the Governor having responsibility for enforcing State laws relating to the abatement of pollution.

(2) The term “interstate agency” means an agency of two or more States established by or pursuant to an agreement or compact approved by the Congress, or any other agency of two or more States, having substantial powers or duties pertaining to the control of pollution as determined and approved by the Administrator.

(3) The term “State” means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territory of the Pacific Islands.

(4) The term “municipality” means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under [section 1288](#) of this title.

(5) The term “person” means an individual, corporation, partnership, association, State, municipality, commission, or political subdivision of a State, or any interstate body.

(6) The term “pollutant” means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. This term does not mean (A) “sewage from vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces” within the meaning of [section 1322](#) of this title; or (B) water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the State in which the well

is located, and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources.

(7) The term “navigable waters” means the waters of the United States, including the territorial seas.

(8) The term “territorial seas” means the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles.

(9) The term “contiguous zone” means the entire zone established or to be established by the United States under article 24 of the Convention of the Territorial Sea and the Contiguous Zone.

(10) The term “ocean” means any portion of the high seas beyond the contiguous zone.

(11) The term “effluent limitation” means any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance.

(12) The term “discharge of a pollutant” and the term “discharge of pollutants” each means (A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft.

(13) The term “toxic pollutant” means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.

(14) The term “point source” means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

(15) The term “biological monitoring” shall mean the determination of the effects on aquatic life, including accumulation of pollutants in tissue, in receiving waters due to the discharge of pollutants (A) by techniques and procedures, including sampling of organisms representative of appropriate levels of the food chain appropriate to the volume and the physical, chemical, and biological characteristics of the effluent, and (B) at appropriate frequencies and locations.

(16) The term “discharge” when used without qualification includes a discharge of a pollutant, and a discharge of pollutants.

(17) The term “schedule of compliance” means a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, other limitation, prohibition, or standard.

(18) The term “industrial user” means those industries identified in the Standard Industrial Classification Manual, Bureau of the Budget, 1967, as amended and supplemented, under the category of “Division D--Manufacturing” and such other classes of significant waste producers as, by regulation, the Administrator deems appropriate.

(19) The term “pollution” means the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.

(20) The term “medical waste” means isolation wastes; infectious agents; human blood and blood products; pathological wastes; sharps; body parts; contaminated bedding; surgical wastes and potentially contaminated laboratory wastes; dialysis wastes; and such additional medical items as the Administrator shall prescribe by regulation.

(21) Coastal recreation waters

(A) In general

The term “coastal recreation waters” means--

(i) the Great Lakes; and

(ii) marine coastal waters (including coastal estuaries) that are designated under [section 1313\(c\)](#) of this title by a State for use for swimming, bathing, surfing, or similar water contact activities.

(B) Exclusions

The term “coastal recreation waters” does not include--

(i) inland waters; or

(ii) waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea.

(22) Floatable material

(A) In general

The term “floatable material” means any foreign matter that may float or remain suspended in the water column.

(B) Inclusions

The term “floatable material” includes--

- (i) plastic;
- (ii) aluminum cans;
- (iii) wood products;
- (iv) bottles; and
- (v) paper products.

(23) Pathogen indicator

The term “pathogen indicator” means a substance that indicates the potential for human infectious disease.

(24) Oil and gas exploration and production

The term “oil and gas exploration, production, processing, or treatment operations or transmission facilities” means all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activities.

(25) Recreational vessel

(A) In general

The term “recreational vessel” means any vessel that is--

- (i) manufactured or used primarily for pleasure; or
- (ii) leased, rented, or chartered to a person for the pleasure of that person.

(B) Exclusion

The term “recreational vessel” does not include a vessel that is subject to Coast Guard inspection and that--

(i) is engaged in commercial use; or

(ii) carries paying passengers.

(26) Treatment works

The term “treatment works” has the meaning given the term in [section 1292](#) of this title.

CREDIT(S)

(June 30, 1948, c. 758, Title V, § 502, as added Pub.L. 92-500, § 2, Oct. 18, 1972, 86 Stat. 886; amended [Pub.L. 95-217](#), § 33(b), Dec. 27, 1977, 91 Stat. 1577; [Pub.L. 100-4, Title V, §§ 502\(a\)](#), 503, Feb. 4, 1987, 101 Stat. 75; [Pub.L. 100-688, Title III, § 3202\(a\)](#), Nov. 18, 1988, 102 Stat. 4154; [Pub.L. 104-106, Div. A, Title III, § 325\(c\)\(3\)](#), Feb. 10, 1996, 110 Stat. 259; [Pub.L. 106-284, § 5](#), Oct. 10, 2000, 114 Stat. 875; [Pub.L. 109-58, Title III, § 323](#), Aug. 8, 2005, 119 Stat. 694; [Pub.L. 110-288, § 3](#), July 29, 2008, 122 Stat. 2650; [Pub.L. 113-121, Title V, § 5012\(b\)](#), June 10, 2014, 128 Stat. 1328.)

[Notes of Decisions \(203\)](#)

33 U.S.C.A. § 1362, 33 USCA § 1362

Current through P.L. 115-68.

End of Document

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ATTACHMENT 3

United States Code Annotated

Title 33. Navigation and Navigable Waters (Refs & Annos)

Chapter 26. Water Pollution Prevention and Control (Refs & Annos)

Subchapter III. Standards and Enforcement (Refs & Annos)

33 U.S.C.A. § 1318

§ 1318. Records and reports; inspections

Currentness

(a) Maintenance; monitoring equipment; entry; access to information

Whenever required to carry out the objective of this chapter, including but not limited to (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition, or effluent standard, pretreatment standard, or standard of performance under this chapter; (2) determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; (3) any requirement established under this section; or (4) carrying out [sections 1315, 1321, 1342, 1344](#) (relating to State permit programs), 1345, and 1364 of this title--

(A) the Administrator shall require the owner or operator of any point source to (i) establish and maintain such records, (ii) make such reports, (iii) install, use, and maintain such monitoring equipment or methods (including where appropriate, biological monitoring methods), (iv) sample such effluents (in accordance with such methods, at such locations, at such intervals, and in such manner as the Administrator shall prescribe), and (v) provide such other information as he may reasonably require; and

(B) the Administrator or his authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of his credentials--

(i) shall have a right of entry to, upon, or through any premises in which an effluent source is located or in which any records required to be maintained under clause (A) of this subsection are located, and

(ii) may at reasonable times have access to and copy any records, inspect any monitoring equipment or method required under clause (A), and sample any effluents which the owner or operator of such source is required to sample under such clause.

(b) Availability to public; trade secrets exception; penalty for disclosure of confidential information

Any records, reports, or information obtained under this section (1) shall, in the case of effluent data, be related to any applicable effluent limitations, toxic, pretreatment, or new source performance standards, and (2) shall be available to the public, except that upon a showing satisfactory to the Administrator by any person that records, reports, or information, or particular part thereof (other than effluent data), to which the Administrator has access under this section, if made public would divulge methods or processes entitled to protection as trade secrets of such person, the Administrator shall consider such record, report, or information, or particular portion thereof confidential in accordance with the purposes

of [section 1905 of Title 18](#). Any authorized representative of the Administrator (including an authorized contractor acting as a representative of the Administrator) who knowingly or willfully publishes, divulges, discloses, or makes known in any manner or to any extent not authorized by law any information which is required to be considered confidential under this subsection shall be fined not more than \$1,000 or imprisoned not more than 1 year, or both. Nothing in this subsection shall prohibit the Administrator or an authorized representative of the Administrator (including any authorized contractor acting as a representative of the Administrator) from disclosing records, reports, or information to other officers, employees, or authorized representatives of the United States concerned with carrying out this chapter or when relevant in any proceeding under this chapter.

(c) Application of State law

Each State may develop and submit to the Administrator procedures under State law for inspection, monitoring, and entry with respect to point sources located in such State. If the Administrator finds that the procedures and the law of any State relating to inspection, monitoring, and entry are applicable to at least the same extent as those required by this section, such State is authorized to apply and enforce its procedures for inspection, monitoring, and entry with respect to point sources located in such State (except with respect to point sources owned or operated by the United States).

(d) Access by Congress

Notwithstanding any limitation contained in this section or any other provision of law, all information reported to or otherwise obtained by the Administrator (or any representative of the Administrator) under this chapter shall be made available, upon written request of any duly authorized committee of Congress, to such committee.

CREDIT(S)

(June 30, 1948, c. 758, Title III, § 308, as added Pub.L. 92-500, § 2, Oct. 18, 1972, 86 Stat. 858; amended [Pub.L. 95-217](#), § 67(c)(1), Dec. 27, 1977, 91 Stat. 1606; [Pub.L. 100-4](#), Title III, § 310, Title IV, § 406(d)(1), Feb. 4, 1987, 101 Stat. 41, 73.)

[Notes of Decisions \(21\)](#)

33 U.S.C.A. § 1318, 33 USCA § 1318
Current through P.L. 115-68.

ATTACHMENT 4



KeyCite Yellow Flag - Negative Treatment

Proposed Regulation

[Code of Federal Regulations](#)

[Title 40. Protection of Environment](#)

[Chapter I. Environmental Protection Agency \(Refs & Annos\)](#)

[Subchapter D. Water Programs](#)

[Part 122. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System \(Refs & Annos\)](#)

[Subpart B. Permit Application and Special NPDES Program Requirements](#)

40 C.F.R. § 122.21

§ 122.21 Application for a permit (applicable to State programs, see § 123.25).

Effective: October 14, 2014

[Currentness](#)

(a) Duty to apply.

(1) Any person who discharges or proposes to discharge pollutants or who owns or operates a “sludge-only facility” whose sewage sludge use or disposal practice is regulated by part 503 of this chapter, and who does not have an effective permit, except persons covered by general permits under § 122.28, excluded under § 122.3, or a user of a privately owned treatment works unless the Director requires otherwise under § 122.44(m), must submit a complete application to the Director in accordance with this section and part 124 of this chapter. The requirements for concentrated animal feeding operations are described in § 122.23(d).

(2) Application Forms:

(i) All applicants for EPA-issued permits must submit applications on EPA permit application forms. More than one application form may be required from a facility depending on the number and types of discharges or outfalls found there. Application forms may be obtained by contacting the EPA water resource center at (202) 260-7786 or Water Resource Center, U.S. EPA, Mail Code 4100, 1200 Pennsylvania Ave., NW., Washington, DC 20460 or at the EPA Internet site www.epa.gov/owm/npdes.htm. Applications for EPA-issued permits must be submitted as follows:

(A) All applicants, other than POTWs and TWTDS, must submit Form 1.

(B) Applicants for new and existing POTWs must submit the information contained in paragraph (j) of this section using Form 2A or other form provided by the director.

(C) Applicants for concentrated animal feeding operations or aquatic animal production facilities must submit Form 2B.

(D) Applicants for existing industrial facilities (including manufacturing facilities, commercial facilities, mining activities, and silvicultural activities), must submit Form 2C.

(E) Applicants for new industrial facilities that discharge process wastewater must submit Form 2D.

(F) Applicants for new and existing industrial facilities that discharge only nonprocess wastewater must submit Form 2E.

(G) Applicants for new and existing facilities whose discharge is composed entirely of storm water associated with industrial activity must submit Form 2F, unless exempted by § 122.26(c)(1)(ii). If the discharge is composed of storm water and non-storm water, the applicant must also submit, Forms 2C, 2D, and/or 2E, as appropriate (in addition to Form 2F).

(H) Applicants for new and existing TWTDS, subject to paragraph (c)(2)(i) of this section must submit the application information required by paragraph (q) of this section, using Form 2S or other form provided by the director.

(ii) The application information required by paragraph (a)(2)(i) of this section may be electronically submitted if such method of submittal is approved by EPA or the Director.

(iii) Applicants can obtain copies of these forms by contacting the Water Management Divisions (or equivalent division which contains the NPDES permitting function) of the EPA Regional Offices. The Regional Offices' addresses can be found at § 1.7 of this chapter.

(iv) Applicants for State-issued permits must use State forms which must require at a minimum the information listed in the appropriate paragraphs of this section.

(b) Who applies? When a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit.

(c) Time to apply.

(1) Any person proposing a new discharge, shall submit an application at least 180 days before the date on which the discharge is to commence, unless permission for a later date has been granted by the Director. Facilities proposing a new discharge of storm water associated with industrial activity shall submit an application 180 days before that facility commences industrial activity which may result in a discharge of storm water associated with that industrial activity. Facilities described under § 122.26(b)(14)(x) or (b)(15)(i) shall submit applications at least 90 days before the date on which construction is to commence. Different submittal dates may be required under the terms of applicable general permits. Persons proposing a new discharge are encouraged to submit their applications well in advance of the 90 or 180 day requirements to avoid delay. See also paragraph (k) of this section and § 122.26(c)(1)(i)(G) and (c)(1)(ii).

(2) Permits under section 405(f) of CWA. All TWTDS whose sewage sludge use or disposal practices are regulated by part 503 of this chapter must submit permit applications according to the applicable schedule in paragraphs (c)(2)(i) or (ii) of this section.

(i) A TWTDS with a currently effective NPDES permit must submit a permit application at the time of its next NPDES permit renewal application. Such information must be submitted in accordance with paragraph (d) of this section.

(ii) Any other TWTDS not addressed under paragraph (c)(2)(i) of this section must submit the information listed in paragraphs (c)(2)(ii)(A) through (E) of this section to the Director within 1 year after publication of a standard applicable to its sewage sludge use or disposal practice(s), using Form 2S or another form provided by the Director. The Director will determine when such TWTDS must submit a full permit application.

(A) The TWTDS's name, mailing address, location, and status as federal, State, private, public or other entity;

(B) The applicant's name, address, telephone number, and ownership status;

(C) A description of the sewage sludge use or disposal practices. Unless the sewage sludge meets the requirements of paragraph (q)(8)(iv) of this section, the description must include the name and address of any facility where sewage sludge is sent for treatment or disposal, and the location of any land application sites;

(D) Annual amount of sewage sludge generated, treated, used or disposed (estimated dry weight basis); and

(E) The most recent data the TWTDS may have on the quality of the sewage sludge.

(iii) Notwithstanding paragraphs (c)(2)(i) or (ii) of this section, the Director may require permit applications from any TWTDS at any time if the Director determines that a permit is necessary to protect public health and the environment from any potential adverse effects that may occur from toxic pollutants in sewage sludge.

(iv) Any TWTDS that commences operations after promulgation of an applicable "standard for sewage sludge use or disposal" must submit an application to the Director at least 180 days prior to the date proposed for commencing operations.

(d) Duty to reapply.

(1) Any POTW with a currently effective permit shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

(2) All other permittees with currently effective permits shall submit a new application 180 days before the existing permit expires, except that:

(i) The Regional Administrator may grant permission to submit an application later than the deadline for submission otherwise applicable, but no later than the permit expiration date; and

(3) [Reserved]

(e) Completeness.

(1) The Director shall not issue a permit before receiving a complete application for a permit except for NPDES general permits. An application for a permit is complete when the Director receives an application form and any supplemental information which are completed to his or her satisfaction. The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity. For EPA administered NPDES programs, an application which is reviewed under § 124.3 of this chapter is complete when the Director receives either a complete application or the information listed in a notice of deficiency.

(2) A permit application shall not be considered complete if a permitting authority has waived application requirements under paragraphs (j) or (q) of this section and EPA has disapproved the waiver application. If a waiver request has been submitted to EPA more than 210 days prior to permit expiration and EPA has not disapproved the waiver application 181 days prior to permit expiration, the permit application lacking the information subject to the waiver application shall be considered complete.

(3) Except as specified in 122.21(e)(3)(ii), a permit application shall not be considered complete unless all required quantitative data are collected in accordance with sufficiently sensitive analytical methods approved under 40 CFR part 136 or required under 40 CFR chapter I, subchapter N or O.

(i) For the purposes of this requirement, a method approved under 40 CFR part 136 or required under 40 CFR chapter I, subchapter N or O is “sufficiently sensitive” when:

(A) The method minimum level (ML) is at or below the level of the applicable water quality criterion for the measured pollutant or pollutant parameter; or

(B) The method ML is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or

(C) The method has the lowest ML of the analytical methods approved under 40 CFR part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter.

Note to paragraph (e)(3)(i): Consistent with 40 CFR part 136, applicants have the option of providing matrix or sample specific minimum levels rather than the published levels. Further, where an applicant can demonstrate that, despite a good faith effort to use a method that would otherwise meet the definition of “sufficiently sensitive”, the analytical results are not consistent with the QA/QC specifications for that method, then the Director may determine that the method is not performing adequately and the applicant should select a different method from the remaining EPA–approved methods that is sufficiently sensitive consistent with 40 CFR 122.21(e)(3)(i). Where no other EPA–approved methods exist, the applicant should select a method consistent with 40 CFR 122.21(e)(3)(ii).

(ii) When there is no analytical method that has been approved under 40 CFR part 136, required under 40 CFR chapter I, subchapter N or O, and is not otherwise required by the Director, the applicant may use any suitable method but shall provide a description of the method. When selecting a suitable method, other factors such as a method's precision, accuracy, or resolution, may be considered when assessing the performance of the method.

(f) Information requirements. All applicants for NPDES permits, other than POTWs and other TWTDS, must provide the following information to the Director, using the application form provided by the Director. Additional information required of applicants is set forth in paragraphs (g) through (k) of this section.

(1) The activities conducted by the applicant which require it to obtain an NPDES permit.

(2) Name, mailing address, and location of the facility for which the application is submitted.

(3) Up to four SIC codes which best reflect the principal products or services provided by the facility.

(4) The operator's name, address, telephone number, ownership status, and status as Federal, State, private, public, or other entity.

(5) Whether the facility is located on Indian lands.

(6) A listing of all permits or construction approvals received or applied for under any of the following programs:

(i) Hazardous Waste Management program under RCRA.

(ii) UIC program under SDWA.

(iii) NPDES program under CWA.

(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act.

(v) Nonattainment program under the Clean Air Act.

(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.

(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.

(viii) Dredge or fill permits under section 404 of CWA.

(ix) Other relevant environmental permits, including State permits.

(7) A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its hazardous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant in the map area.

(8) A brief description of the nature of the business.

(g) Application requirements for existing manufacturing, commercial, mining, and silvicultural dischargers. Existing manufacturing, commercial mining, and silvicultural dischargers applying for NPDES permits, except for those facilities subject to the requirements of § 122.21(h), shall provide the following information to the Director, using application forms provided by the Director.

(1) Outfall location. The latitude and longitude to the nearest 15 seconds and the name of the receiving water.

(2) Line drawing. A line drawing of the water flow through the facility with a water balance, showing operations contributing wastewater to the effluent and treatment units. Similar processes, operations, or production areas may be indicated as a single unit, labeled to correspond to the more detailed identification under paragraph (g)(3) of this section. The water balance must show approximate average flows at intake and discharge points and between units, including treatment units. If a water balance cannot be determined (for example, for certain mining activities), the applicant may provide instead a pictorial description of the nature and amount of any sources of water and any collection and treatment measures.

(3) Average flows and treatment. A narrative identification of each type of process, operation, or production area which contributes wastewater to the effluent for each outfall, including process wastewater, cooling water, and stormwater runoff; the average flow which each process contributes; and a description of the treatment the wastewater receives, including the ultimate disposal of any solid or fluid wastes other than by discharge. Processes, operations, or production areas may be described in general terms (for example, “dye-making reactor”, “distillation tower”). For a privately owned treatment works, this information shall include the identity of each user of the treatment works. The average flow of point sources composed of storm water may be estimated. The basis for the rainfall event and the method of estimation must be indicated.

(4) Intermittent flows. If any of the discharges described in paragraph (g)(3) of this section are intermittent or seasonal, a description of the frequency, duration and flow rate of each discharge occurrence (except for stormwater runoff, spillage or leaks).

(5) Maximum production. If an effluent guideline promulgated under [section 304](#) of CWA applies to the applicant and is expressed in terms of production (or other measure of operation), a reasonable measure of the applicant's actual production reported in the units used in the applicable effluent guideline. The reported measure must reflect the actual production of the facility as required by [§ 122.45\(b\)\(2\)](#).

(6) Improvements. If the applicant is subject to any present requirements or compliance schedules for construction, upgrading or operation of waste treatment equipment, an identification of the abatement requirement, a description of the abatement project, and a listing of the required and projected final compliance dates.

(7) Effluent characteristics.

(i) Information on the discharge of pollutants specified in this paragraph (g)(7) (except information on storm water discharges which is to be provided as specified in [§ 122.26](#)). When “quantitative data” for a pollutant are required, the applicant must collect a sample of effluent and analyze it for the pollutant in accordance with analytical methods approved under Part 136 of this chapter unless use of another method is required for the pollutant under 40 CFR subchapters N or O. When no analytical method is approved under Part 136 or required under subchapters N or O, the applicant may use any suitable method but must provide a description of the method. When an applicant has two or more outfalls with substantially identical effluents, the Director may allow the applicant to test only one outfall and report that quantitative data as applying to the substantially identical outfall. The requirements in paragraphs (g)(7)(vi) and (vii) of this section state that an applicant must provide quantitative data for certain pollutants known or believed to be present do not apply to pollutants present in a discharge solely as the result of their presence in intake water; however, an applicant must report such pollutants as present. When paragraph (g) (7) of this section requires analysis of pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform (including E. coli), and Enterococci (previously known as fecal streptococcus at [§ 122.26 \(d\)\(2\)\(iii\) \(A\)\(3\)](#)), or volatile organics, grab samples must be collected for those pollutants. For all other pollutants, a 24-hour composite sample, using a minimum of four (4) grab samples, must be used unless specified otherwise at 40 CFR Part 136. However, a minimum of one grab sample may be taken for effluents from holding ponds or other impoundments with a retention period greater than 24 hours. In addition, for discharges other than storm water discharges, the Director may waive composite sampling for any outfall for which the applicant demonstrates that the use of an automatic sampler is infeasible and that the minimum of four (4) grab samples will be a representative sample of the effluent being discharged. Results of analyses of individual grab samples for any parameter may be averaged to obtain the daily average. Grab samples that are not required to be analyzed immediately (see Table II at [40 CFR 136.3 \(e\)](#)) may be composited in the laboratory, provided that container, preservation, and holding time requirements are met (see Table II at [40 CFR 136.3 \(e\)](#)) and that sample integrity is not compromised by compositing.

(ii) Storm water discharges. For storm water discharges, all samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inch and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where feasible, the variance in the duration of the event and the total rainfall of the event should not exceed 50 percent from the average or median rainfall event in that area. For all applicants, a flow-weighted composite shall be taken for either the entire discharge or for the first three hours of the discharge.

The flow-weighted composite sample for a storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes (applicants submitting permit applications for storm water discharges under § 122.26(d) may collect flow-weighted composite samples using different protocols with respect to the time duration between the collection of sample aliquots, subject to the approval of the Director). However, a minimum of one grab sample may be taken for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours. For a flow-weighted composite sample, only one analysis of the composite of aliquots is required. For storm water discharge samples taken from discharges associated with industrial activities, quantitative data must be reported for the grab sample taken during the first thirty minutes (or as soon thereafter as practicable) of the discharge for all pollutants specified in § 122.26(c)(1). For all storm water permit applicants taking flow-weighted composites, quantitative data must be reported for all pollutants specified in § 122.26 except pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform, and fecal streptococcus. The Director may allow or establish appropriate site-specific sampling procedures or requirements, including sampling locations, the season in which the sampling takes place, the minimum duration between the previous measurable storm event and the storm event sampled, the minimum or maximum level of precipitation required for an appropriate storm event, the form of precipitation sampled (snow melt or rain fall), protocols for collecting samples under part 136 of this chapter, and additional time for submitting data on a case-by-case basis. An applicant is expected to “know or have reason to believe” that a pollutant is present in an effluent based on an evaluation of the expected use, production, or storage of the pollutant, or on any previous analyses for the pollutant. (For example, any pesticide manufactured by a facility may be expected to be present in contaminated storm water runoff from the facility.)

(iii) Reporting requirements. Every applicant must report quantitative data for every outfall for the following pollutants:

Biochemical Oxygen Demand (BOD5)

Chemical Oxygen Demand

Total Organic Carbon

Total Suspended Solids

Ammonia (as N)

Temperature (both winter and summer)

pH

(iv) The Director may waive the reporting requirements for individual point sources or for a particular industry category for one or more of the pollutants listed in paragraph (g)(7)(iii) of this section if the applicant has demonstrated that such a waiver is appropriate because information adequate to support issuance of a permit can be obtained with less stringent requirements.

(v) Each applicant with processes in one or more primary industry category (see appendix A of this part) contributing to a discharge must report quantitative data for the following pollutants in each outfall containing process wastewater:

(A) The organic toxic pollutants in the fractions designated in table I of appendix D of this part for the applicant's industrial category or categories unless the applicant qualifies as a small business under paragraph (g)(8) of this section. Table II of appendix D of this part lists the organic toxic pollutants in each fraction. The fractions result from the sample preparation required by the analytical procedure which uses gas chromatography/mass spectrometry. A determination that an applicant falls within a particular industrial category for the purposes of selecting fractions for testing is not conclusive as to the applicant's inclusion in that category for any other purposes. See Notes 2, 3, and 4 of this section.

(B) The pollutants listed in table III of appendix D of this part (the toxic metals, cyanide, and total phenols).

(vi)(A) Each applicant must indicate whether it knows or has reason to believe that any of the pollutants in table IV of appendix D of this part (certain conventional and nonconventional pollutants) is discharged from each outfall. If an applicable effluent limitations guideline either directly limits the pollutant or, by its express terms, indirectly limits the pollutant through limitations on an indicator, the applicant must report quantitative data. For every pollutant discharged which is not so limited in an effluent limitations guideline, the applicant must either report quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

(B) Each applicant must indicate whether it knows or has reason to believe that any of the pollutants listed in table II or table III of appendix D of this part (the toxic pollutants and total phenols) for which quantitative data are not otherwise required under paragraph (g)(7)(v) of this section are discharged from each outfall. For every pollutant expected to be discharged in concentrations of 10 ppb or greater the applicant must report quantitative data. For acrolein, acrylonitrile, 2,4 dinitrophenol, and 2-methyl-4, 6 dinitrophenol, where any of these four pollutants are expected to be discharged in concentrations of 100 ppb or greater the applicant must report quantitative data. For every pollutant expected to be discharged in concentrations less than 10 ppb, or in the case of acrolein, acrylonitrile, 2,4 dinitrophenol, and 2-methyl-4, 6 dinitrophenol, in concentrations less than 100 ppb, the applicant must either submit quantitative data or briefly describe the reasons the pollutant is expected to be discharged. An applicant qualifying as a small business under paragraph (g)(8) of this section is not required to analyze for pollutants listed in table II of appendix D of this part (the organic toxic pollutants).

(vii) Each applicant must indicate whether it knows or has reason to believe that any of the pollutants in table V of appendix D of this part (certain hazardous substances and asbestos) are discharged from each outfall. For every pollutant expected to be discharged, the applicant must briefly describe the reasons the pollutant is expected to be discharged, and report any quantitative data it has for any pollutant.

(viii) Each applicant must report qualitative data, generated using a screening procedure not calibrated with analytical standards, for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) if it:

(A) Uses or manufactures 2,4,5-trichlorophenoxy acetic acid (2,4,5,-T); 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5,-TP); 2-(2,4,5-trichlorophenoxy) ethyl, 2,2-dichloropropionate (Erbon); O,O-dimethyl O-(2,4,5-trichlorophenyl) phosphorothioate (Ronnell); 2,4,5-trichlorophenol (TCP); or hexachlorophene (HCP);
or

(B) Knows or has reason to believe that TCDD is or may be present in an effluent.

(8) Small business exemption. An application which qualifies as a small business under one of the following criteria is exempt from the requirements in paragraph (g)(7)(v)(A) or (g)(7)(vi)(A) of this section to submit quantitative data for the pollutants listed in table II of appendix D of this part (the organic toxic pollutants):

(i) For coal mines, a probable total annual production of less than 100,000 tons per year.

(ii) For all other applicants, gross total annual sales averaging less than \$100,000 per year (in second quarter 1980 dollars).

(9) Used or manufactured toxics. A listing of any toxic pollutant which the applicant currently uses or manufactures as an intermediate or final product or byproduct. The Director may waive or modify this requirement for any applicant if the applicant demonstrates that it would be unduly burdensome to identify each toxic pollutant and the Director has adequate information to issue the permit.

(10) [Reserved]

(11) Biological toxicity tests. An identification of any biological toxicity tests which the applicant knows or has reason to believe have been made within the last 3 years on any of the applicant's discharges or on a receiving water in relation to a discharge.

(12) Contract analyses. If a contract laboratory or consulting firm performed any of the analyses required by paragraph (g)(7) of this section, the identity of each laboratory or firm and the analyses performed.

(13) Additional information. In addition to the information reported on the application form, applicants shall provide to the Director, at his or her request, such other information as the Director may reasonably require to assess the discharges of the facility and to determine whether to issue an NPDES permit. The additional information may include additional quantitative data and bioassays to assess the relative toxicity of discharges to aquatic life and requirements to determine the cause of the toxicity.

(h) Application requirements for manufacturing, commercial, mining and silvicultural facilities which discharge only non-process wastewater. Except for stormwater discharges, all manufacturing, commercial, mining and silvicultural dischargers applying for NPDES permits which discharge only non-process wastewater not regulated by an effluent limitations guideline or new source performance standard shall provide the following information to the Director, using application forms provided by the Director:

(1) Outfall location. Outfall number, latitude and longitude to the nearest 15 seconds, and the name of the receiving water.

(2) Discharge date (for new dischargers). Date of expected commencement of discharge.

(3) Type of waste. An identification of the general type of waste discharged, or expected to be discharged upon commencement of operations, including sanitary wastes, restaurant or cafeteria wastes, or noncontact cooling water. An identification of cooling water additives (if any) that are used or expected to be used upon commencement of operations, along with their composition if existing composition is available.

(4) Effluent characteristics.

(i) Quantitative data for the pollutants or parameters listed below, unless testing is waived by the Director. The quantitative data may be data collected over the past 365 days, if they remain representative of current operations, and must include maximum daily value, average daily value, and number of measurements taken. The applicant must collect and analyze samples in accordance with 40 CFR Part 136. When analysis of pH, temperature, residual chlorine, oil and grease, or fecal coliform (including E. coli), and Enterococci (previously known as fecal streptococcus) and volatile organics is required in paragraphs (h)(4)(i)(A) through (K) of this section, grab samples must be collected for those pollutants. For all other pollutants, a 24-hour composite sample, using a minimum of four (4) grab samples, must be used unless specified otherwise at 40 CFR Part 136. For a composite sample, only one analysis of the composite of aliquots is required. New dischargers must include estimates for the pollutants or parameters listed below instead of actual sampling data, along with the source of each estimate. All levels must be reported or estimated as concentration and as total mass, except for flow, pH, and temperature.

(A) Biochemical Oxygen Demand (BOD₅).

(B) Total Suspended Solids (TSS).

(C) Fecal Coliform (if believed present or if sanitary waste is or will be discharged).

(D) Total Residual Chlorine (if chlorine is used).

(E) Oil and Grease.

(F) Chemical Oxygen Demand (COD) (if non-contact cooling water is or will be discharged).

(G) Total Organic Carbon (TOC) (if non-contact cooling water is or will be discharged).

(H) Ammonia (as N).

(I) Discharge Flow.

(J) pH.

(K) Temperature (Winter and Summer).

(ii) The Director may waive the testing and reporting requirements for any of the pollutants or flow listed in paragraph (h)(4)(i) of this section if the applicant submits a request for such a waiver before or with his application which demonstrates that information adequate to support issuance of a permit can be obtained through less stringent requirements.

(iii) If the applicant is a new discharger, he must complete and submit Item IV of Form 2e (see § 122.21(h)(4)) by providing quantitative data in accordance with that section no later than two years after commencement of discharge. However, the applicant need not complete those portions of Item IV requiring tests which he has already performed and reported under the discharge monitoring requirements of his NPDES permit.

(iv) The requirements of parts i and iii of this section that an applicant must provide quantitative data or estimates of certain pollutants do not apply to pollutants present in a discharge solely as a result of their presence in intake water. However, an applicant must report such pollutants as present. Net credit may be provided for the presence of pollutants in intake water if the requirements of § 122.45(g) are met.

(5) Flow. A description of the frequency of flow and duration of any seasonal or intermittent discharge (except for stormwater runoff, leaks, or spills).

(6) Treatment system. A brief description of any system used or to be used.

(7) Optional information. Any additional information the applicant wishes to be considered, such as influent data for the purpose of obtaining “net” credits pursuant to § 122.45(g).

(8) Certification. Signature of certifying official under § 122.22.

(i) Application requirements for new and existing concentrated animal feeding operations and aquatic animal production facilities. New and existing concentrated animal feeding operations (defined in § 122.23) and concentrated aquatic animal production facilities (defined in § 122.24) shall provide the following information to the Director, using the application form provided by the Director:

(1) For concentrated animal feeding operations:

(i) The name of the owner or operator;

(ii) The facility location and mailing addresses;

(iii) Latitude and longitude of the production area (entrance to production area);

(iv) A topographic map of the geographic area in which the CAFO is located showing the specific location of the production area, in lieu of the requirements of paragraph (f)(7) of this section;

(v) Specific information about the number and type of animals, whether in open confinement or housed under roof (beef cattle, broilers, layers, swine weighing 55 pounds or more, swine weighing less than 55 pounds, mature dairy cows, dairy heifers, veal calves, sheep and lambs, horses, ducks, turkeys, other);

(vi) The type of containment and storage (anaerobic lagoon, roofed storage shed, storage ponds, underfloor pits, above ground storage tanks, below ground storage tanks, concrete pad, impervious soil pad, other) and total capacity for manure, litter, and process wastewater storage (tons/gallons);

(vii) The total number of acres under control of the applicant available for land application of manure, litter, or process wastewater;

(viii) Estimated amounts of manure, litter, and process wastewater generated per year (tons/gallons);

(ix) Estimated amounts of manure, litter and process wastewater transferred to other persons per year (tons/gallons);
and

(x) A nutrient management plan that at a minimum satisfies the requirements specified in § 122.42(e), including, for all CAFOs subject to 40 CFR part 412, subpart C or subpart D, the requirements of 40 CFR 412.4(c), as applicable.

(2) For concentrated aquatic animal production facilities:

(i) The maximum daily and average monthly flow from each outfall.

(ii) The number of ponds, raceways, and similar structures.

(iii) The name of the receiving water and the source of intake water.

(iv) For each species of aquatic animals, the total yearly and maximum harvestable weight.

(v) The calendar month of maximum feeding and the total mass of food fed during that month.

(j) Application requirements for new and existing POTWs. Unless otherwise indicated, all POTWs and other dischargers designated by the Director must provide, at a minimum, the information in this paragraph to the Director, using Form 2A or another application form provided by the Director. Permit applicants must submit all information available at the time of permit application. The information may be provided by referencing information previously submitted to the Director. The Director may waive any requirement of this paragraph if he or she has access to substantially identical

information. The Director may also waive any requirement of this paragraph that is not of material concern for a specific permit, if approved by the Regional Administrator. The waiver request to the Regional Administrator must include the State's justification for the waiver. A Regional Administrator's disapproval of a State's proposed waiver does not constitute final Agency action, but does provide notice to the State and permit applicant(s) that EPA may object to any State-issued permit issued in the absence of the required information.

(1) Basic application information. All applicants must provide the following information:

(i) Facility information. Name, mailing address, and location of the facility for which the application is submitted;

(ii) Applicant information. Name, mailing address, and telephone number of the applicant, and indication as to whether the applicant is the facility's owner, operator, or both;

(iii) Existing environmental permits. Identification of all environmental permits or construction approvals received or applied for (including dates) under any of the following programs:

(A) Hazardous Waste Management program under the Resource Conservation and Recovery Act (RCRA), Subpart C;

(B) Underground Injection Control program under the Safe Drinking Water Act (SDWA);

(C) NPDES program under Clean Water Act (CWA);

(D) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;

(E) Nonattainment program under the Clean Air Act;

(F) National Emission Standards for Hazardous Air Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;

(G) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act;

(H) Dredge or fill permits under section 404 of the CWA; and

(I) Other relevant environmental permits, including State permits;

(iv) Population. The name and population of each municipal entity served by the facility, including unincorporated connector districts. Indicate whether each municipal entity owns or maintains the collection system and whether the collection system is separate sanitary or combined storm and sanitary, if known;

(v) Indian country. Information concerning whether the facility is located in Indian country and whether the facility discharges to a receiving stream that flows through Indian country;

(vi) Flow rate. The facility's design flow rate (the wastewater flow rate the plant was built to handle), annual average daily flow rate, and maximum daily flow rate for each of the previous 3 years;

(vii) Collection system. Identification of type(s) of collection system(s) used by the treatment works (i.e., separate sanitary sewers or combined storm and sanitary sewers) and an estimate of the percent of sewer line that each type comprises; and

(viii) Outfalls and other discharge or disposal methods. The following information for outfalls to waters of the United States and other discharge or disposal methods:

(A) For effluent discharges to waters of the United States, the total number and types of outfalls (e.g, treated effluent, combined sewer overflows, bypasses, constructed emergency overflows);

(B) For wastewater discharged to surface impoundments:

(1) The location of each surface impoundment;

(2) The average daily volume discharged to each surface impoundment; and

(3) Whether the discharge is continuous or intermittent;

(C) For wastewater applied to the land:

(1) The location of each land application site;

(2) The size of each land application site, in acres;

(3) The average daily volume applied to each land application site, in gallons per day; and

(4) Whether land application is continuous or intermittent;

(D) For effluent sent to another facility for treatment prior to discharge:

(1) The means by which the effluent is transported;

(2) The name, mailing address, contact person, and phone number of the organization transporting the discharge, if the transport is provided by a party other than the applicant;

(3) The name, mailing address, contact person, phone number, and NPDES permit number (if any) of the receiving facility; and

(4) The average daily flow rate from this facility into the receiving facility, in millions of gallons per day; and

(E) For wastewater disposed of in a manner not included in paragraphs (j)(1)(viii)(A) through (D) of this section (e.g., underground percolation, underground injection):

(1) A description of the disposal method, including the location and size of each disposal site, if applicable;

(2) The annual average daily volume disposed of by this method, in gallons per day; and

(3) Whether disposal through this method is continuous or intermittent;

(2) Additional Information. All applicants with a design flow greater than or equal to 0.1 mgd must provide the following information:

(i) Inflow and infiltration. The current average daily volume of inflow and infiltration, in gallons per day, and steps the facility is taking to minimize inflow and infiltration;

(ii) Topographic map. A topographic map (or other map if a topographic map is unavailable) extending at least one mile beyond property boundaries of the treatment plant, including all unit processes, and showing:

(A) Treatment plant area and unit processes;

(B) The major pipes or other structures through which wastewater enters the treatment plant and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable;

(C) Each well where fluids from the treatment plant are injected underground;

(D) Wells, springs, and other surface water bodies listed in public records or otherwise known to the applicant within ¼ mile of the treatment works' property boundaries;

(E) Sewage sludge management facilities (including on-site treatment, storage, and disposal sites); and

(F) Location at which waste classified as hazardous under RCRA enters the treatment plant by truck, rail, or dedicated pipe;

(iii) Process flow diagram or schematic.

(A) A diagram showing the processes of the treatment plant, including all bypass piping and all backup power sources or redundancy in the system. This includes a water balance showing all treatment units, including disinfection, and showing daily average flow rates at influent and discharge points, and approximate daily flow rates between treatment units; and

(B) A narrative description of the diagram; and

(iv) Scheduled improvements, schedules of implementation. The following information regarding scheduled improvements:

(A) The outfall number of each outfall affected;

(B) A narrative description of each required improvement;

(C) Scheduled or actual dates of completion for the following:

(1) Commencement of construction;

(2) Completion of construction;

(3) Commencement of discharge; and

(4) Attainment of operational level;

(D) A description of permits and clearances concerning other Federal and/or State requirements;

(3) Information on effluent discharges. Each applicant must provide the following information for each outfall, including bypass points, through which effluent is discharged, as applicable:

(i) Description of outfall. The following information about each outfall:

(A) Outfall number;

(B) State, county, and city or town in which outfall is located;

(C) Latitude and longitude, to the nearest second;

(D) Distance from shore and depth below surface;

(E) Average daily flow rate, in million gallons per day;

(F) The following information for each outfall with a seasonal or periodic discharge:

(1) Number of times per year the discharge occurs;

(2) Duration of each discharge;

(3) Flow of each discharge; and

(4) Months in which discharge occurs; and

(G) Whether the outfall is equipped with a diffuser and the type (e.g., high-rate) of diffuser used;

(ii) Description of receiving waters. The following information (if known) for each outfall through which effluent is discharged to waters of the United States:

(A) Name of receiving water;

(B) Name of watershed/river/stream system and United States Soil Conservation Service 14-digit watershed code;

(C) Name of State Management/River Basin and United States Geological Survey 8-digit hydrologic cataloging unit code; and

(D) Critical flow of receiving stream and total hardness of receiving stream at critical low flow (if applicable);

(iii) Description of treatment. The following information describing the treatment provided for discharges from each outfall to waters of the United States:

(A) The highest level of treatment (e.g., primary, equivalent to secondary, secondary, advanced, other) that is provided for the discharge for each outfall and:

- (1) Design biochemical oxygen demand (BOD₅ or CBOD₅) removal (percent);
- (2) Design suspended solids (SS) removal (percent); and, where applicable,
- (3) Design phosphorus (P) removal (percent);
- (4) Design nitrogen (N) removal (percent); and
- (5) Any other removals that an advanced treatment system is designed to achieve.

(B) A description of the type of disinfection used, and whether the treatment plant dechlorinates (if disinfection is accomplished through chlorination);

(4) Effluent monitoring for specific parameters.

(i) As provided in paragraphs (j)(4)(ii) through (x) of this section, all applicants must submit to the Director effluent monitoring information for samples taken from each outfall through which effluent is discharged to waters of the United States, except for CSOs. The Director may allow applicants to submit sampling data for only one outfall on a case-by-case basis, where the applicant has two or more outfalls with substantially identical effluent. The Director may also allow applicants to composite samples from one or more outfalls that discharge into the same mixing zone;

(ii) All applicants must sample and analyze for the pollutants listed in appendix J, Table 1A of this part;

(iii) All applicants with a design flow greater than or equal to 0.1 mgd must sample and analyze for the pollutants listed in appendix J, Table 1 of this part. Facilities that do not use chlorine for disinfection, do not use chlorine elsewhere in the treatment process, and have no reasonable potential to discharge chlorine in their effluent may delete chlorine from Table 1;

(iv) The following applicants must sample and analyze for the pollutants listed in appendix J, Table 2 of this part, and for any other pollutants for which the State or EPA have established water quality standards applicable to the receiving waters:

(A) All POTWs with a design flow rate equal to or greater than one million gallons per day;

(B) All POTWs with approved pretreatment programs or POTWs required to develop a pretreatment program;

- (C) Other POTWs, as required by the Director;

- (v) The Director should require sampling for additional pollutants, as appropriate, on a case-by-case basis;

- (vi) Applicants must provide data from a minimum of three samples taken within four and one-half years prior to the date of the permit application. Samples must be representative of the seasonal variation in the discharge from each outfall. Existing data may be used, if available, in lieu of sampling done solely for the purpose of this application. The Director should require additional samples, as appropriate, on a case-by-case basis.

- (vii) All existing data for pollutants specified in paragraphs (j)(4)(ii) through (v) of this section that is collected within four and one-half years of the application must be included in the pollutant data summary submitted by the applicant. If, however, the applicant samples for a specific pollutant on a monthly or more frequent basis, it is only necessary, for such pollutant, to summarize all data collected within one year of the application.

- (viii) Applicants must collect samples of effluent and analyze such samples for pollutants in accordance with analytical methods approved under 40 CFR Part 136 unless an alternative is specified in the existing NPDES permit. When analysis of pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform (including *E. coli*), or volatile organics is required in paragraphs (j)(4)(ii) through (iv) of this section, grab samples must be collected for those pollutants. For all other pollutants, 24-hour composite samples must be used. For a composite sample, only one analysis of the composite of aliquots is required.

- (ix) The effluent monitoring data provided must include at least the following information for each parameter:
 - (A) Maximum daily discharge, expressed as concentration or mass, based upon actual sample values;

 - (B) Average daily discharge for all samples, expressed as concentration or mass, and the number of samples used to obtain this value;

 - (C) The analytical method used; and

 - (D) The threshold level (i.e., method detection limit, minimum level, or other designated method endpoints) for the analytical method used.

- (x) Unless otherwise required by the Director, metals must be reported as total recoverable.

- (5) Effluent monitoring for whole effluent toxicity.

(i) All applicants must provide an identification of any whole effluent toxicity tests conducted during the four and one-half years prior to the date of the application on any of the applicant's discharges or on any receiving water near the discharge.

(ii) As provided in paragraphs (j)(5)(iii)–(ix) of this section, the following applicants must submit to the Director the results of valid whole effluent toxicity tests for acute or chronic toxicity for samples taken from each outfall through which effluent is discharged to surface waters, except for combined sewer overflows:

(A) All POTWs with design flow rates greater than or equal to one million gallons per day;

(B) All POTWs with approved pretreatment programs or POTWs required to develop a pretreatment program;

(C) Other POTWs, as required by the Director, based on consideration of the following factors:

(1) The variability of the pollutants or pollutant parameters in the POTW effluent (based on chemical-specific information, the type of treatment plant, and types of industrial contributors);

(2) The ratio of effluent flow to receiving stream flow;

(3) Existing controls on point or non-point sources, including total maximum daily load calculations for the receiving stream segment and the relative contribution of the POTW;

(4) Receiving stream characteristics, including possible or known water quality impairment, and whether the POTW discharges to a coastal water, one of the Great Lakes, or a water designated as an outstanding natural resource water; or

(5) Other considerations (including, but not limited to, the history of toxic impacts and compliance problems at the POTW) that the Director determines could cause or contribute to adverse water quality impacts.

(iii) Where the POTW has two or more outfalls with substantially identical effluent discharging to the same receiving stream segment, the Director may allow applicants to submit whole effluent toxicity data for only one outfall on a case-by-case basis. The Director may also allow applicants to composite samples from one or more outfalls that discharge into the same mixing zone.

(iv) Each applicant required to perform whole effluent toxicity testing pursuant to paragraph (j)(5)(ii) of this section must provide:

(A) Results of a minimum of four quarterly tests for a year, from the year preceding the permit application; or

- (B) Results from four tests performed at least annually in the four and one half year period prior to the application, provided the results show no appreciable toxicity using a safety factor determined by the permitting authority.
- (v) Applicants must conduct tests with multiple species (no less than two species; e.g., fish, invertebrate, plant), and test for acute or chronic toxicity, depending on the range of receiving water dilution. EPA recommends that applicants conduct acute or chronic testing based on the following dilutions:
- (A) Acute toxicity testing if the dilution of the effluent is greater than 1000:1 at the edge of the mixing zone;
 - (B) Acute or chronic toxicity testing if the dilution of the effluent is between 100:1 and 1000:1 at the edge of the mixing zone. Acute testing may be more appropriate at the higher end of this range (1000:1), and chronic testing may be more appropriate at the lower end of this range (100:1); and
 - (C) Chronic testing if the dilution of the effluent is less than 100:1 at the edge of the mixing zone.
- (vi) Each applicant required to perform whole effluent toxicity testing pursuant to paragraph (j)(5)(ii) of this section must provide the number of chronic or acute whole effluent toxicity tests that have been conducted since the last permit reissuance.
- (vii) Applicants must provide the results using the form provided by the Director, or test summaries if available and comprehensive, for each whole effluent toxicity test conducted pursuant to paragraph (j)(5)(ii) of this section for which such information has not been reported previously to the Director.
- (viii) Whole effluent toxicity testing conducted pursuant to paragraph (j)(5)(ii) of this section must be conducted using methods approved under 40 CFR part 136. West coast facilities in Washington, Oregon, California, Alaska, Hawaii, and the Pacific Territories are exempted from 40 CFR part 136 chronic methods and must use alternative guidance as directed by the permitting authority.
- (ix) For whole effluent toxicity data submitted to the Director within four and one-half years prior to the date of the application, applicants must provide the dates on which the data were submitted and a summary of the results.
- (x) Each POTW required to perform whole effluent toxicity testing pursuant to paragraph (j)(5)(ii) of this section must provide any information on the cause of toxicity and written details of any toxicity reduction evaluation conducted, if any whole effluent toxicity test conducted within the past four and one-half years revealed toxicity.
- (6) Industrial discharges. Applicants must submit the following information about industrial discharges to the POTW:
- (i) Number of significant industrial users (SIUs) and categorical industrial users (CIUs) discharging to the POTW; and

(ii) POTWs with one or more SIUs shall provide the following information for each SIU, as defined at [40 CFR 403.3\(v\)](#), that discharges to the POTW:

(A) Name and mailing address;

(B) Description of all industrial processes that affect or contribute to the SIU's discharge;

(C) Principal products and raw materials of the SIU that affect or contribute to the SIU's discharge;

(D) Average daily volume of wastewater discharged, indicating the amount attributable to process flow and non-process flow;

(E) Whether the SIU is subject to local limits;

(F) Whether the SIU is subject to categorical standards, and if so, under which category(ies) and subcategory(ies); and

(G) Whether any problems at the POTW (e.g., upsets, pass through, interference) have been attributed to the SIU in the past four and one-half years.

(iii) The information required in paragraphs (j)(6)(i) and (ii) of this section may be waived by the Director for POTWs with pretreatment programs if the applicant has submitted either of the following that contain information substantially identical to that required in paragraphs (j)(6)(i) and (ii) of this section.

(A) An annual report submitted within one year of the application; or

(B) A pretreatment program;

(7) Discharges from hazardous waste generators and from waste cleanup or remediation sites. POTWs receiving Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or RCRA Corrective Action wastes or wastes generated at another type of cleanup or remediation site must provide the following information:

(i) If the POTW receives, or has been notified that it will receive, by truck, rail, or dedicated pipe any wastes that are regulated as RCRA hazardous wastes pursuant to 40 CFR part 261, the applicant must report the following:

(A) The method by which the waste is received (i.e., whether by truck, rail, or dedicated pipe); and

(B) The hazardous waste number and amount received annually of each hazardous waste;

(ii) If the POTW receives, or has been notified that it will receive, wastewaters that originate from remedial activities, including those undertaken pursuant to CERCLA and sections 3004(u) or 3008(h) of RCRA, the applicant must report the following:

(A) The identity and description of the site(s) or facility(ies) at which the wastewater originates;

(B) The identities of the wastewater's hazardous constituents, as listed in appendix VIII of part 261 of this chapter; if known; and

(C) The extent of treatment, if any, the wastewater receives or will receive before entering the POTW;

(iii) Applicants are exempt from the requirements of paragraph (j)(7)(ii) of this section if they receive no more than fifteen kilograms per month of hazardous wastes, unless the wastes are acute hazardous wastes as specified in [40 CFR 261.30\(d\)](#) and [261.33\(e\)](#).

(8) Combined sewer overflows. Each applicant with combined sewer systems must provide the following information:

(i) Combined sewer system information. The following information regarding the combined sewer system:

(A) System map. A map indicating the location of the following:

(1) All CSO discharge points;

(2) Sensitive use areas potentially affected by CSOs (e.g., beaches, drinking water supplies, shellfish beds, sensitive aquatic ecosystems, and outstanding national resource waters); and

(3) Waters supporting threatened and endangered species potentially affected by CSOs; and

(B) System diagram. A diagram of the combined sewer collection system that includes the following information:

(1) The location of major sewer trunk lines, both combined and separate sanitary;

(2) The locations of points where separate sanitary sewers feed into the combined sewer system;

(3) In-line and off-line storage structures;

(4) The locations of flow-regulating devices; and

(5) The locations of pump stations;

(ii) Information on CSO outfalls. The following information for each CSO discharge point covered by the permit application:

(A) Description of outfall. The following information on each outfall:

(1) Outfall number;

(2) State, county, and city or town in which outfall is located;

(3) Latitude and longitude, to the nearest second; and

(4) Distance from shore and depth below surface;

(5) Whether the applicant monitored any of the following in the past year for this CSO:

(i) Rainfall;

(ii) CSO flow volume;

(iii) CSO pollutant concentrations;

(iv) Receiving water quality;

(v) CSO frequency; and

(6) The number of storm events monitored in the past year;

(B) CSO events. The following information about CSO overflows from each outfall:

(1) The number of events in the past year;

(2) The average duration per event, if available;

(3) The average volume per CSO event, if available; and

(4) The minimum rainfall that caused a CSO event, if available, in the last year;

(C) Description of receiving waters. The following information about receiving waters:

(1) Name of receiving water;

(2) Name of watershed/stream system and the United States Soil Conservation Service watershed (14-digit) code (if known); and

(3) Name of State Management/River Basin and the United States Geological Survey hydrologic cataloging unit (8-digit) code (if known); and

(D) CSO operations. A description of any known water quality impacts on the receiving water caused by the CSO (e.g., permanent or intermittent beach closings, permanent or intermittent shellfish bed closings, fish kills, fish advisories, other recreational loss, or exceedance of any applicable State water quality standard);

(9) Contractors. All applicants must provide the name, mailing address, telephone number, and responsibilities of all contractors responsible for any operational or maintenance aspects of the facility; and

(10) Signature. All applications must be signed by a certifying official in compliance with § 122.22.

(k) Application requirements for new sources and new discharges. New manufacturing, commercial, mining and silvicultural dischargers applying for NPDES permits (except for new discharges of facilities subject to the requirements of paragraph (h) of this section or new discharges of storm water associated with industrial activity which are subject to the requirements of § 122.26(c)(1) and this section (except as provided by § 122.26(c)(1)(ii)) shall provide the following information to the Director, using the application forms provided by the Director:

(1) Expected outfall location. The latitude and longitude to the nearest 15 seconds and the name of the receiving water.

(2) Discharge dates. The expected date of commencement of discharge.

(3) Flows, Sources of Pollution, and Treatment Technologies.—

(i) Expected treatment of wastewater. Description of the treatment that the wastewater will receive, along with all operations contributing wastewater to the effluent, average flow contributed by each operation, and the ultimate disposal of any solid or liquid wastes not discharged.

(ii) Line drawing. A line drawing of the water flow through the facility with a water balance as described in § 122.21(g)(2).

(iii) Intermittent flows. If any of the expected discharges will be intermittent or seasonal, a description of the frequency, duration and maximum daily flow rate of each discharge occurrence (except for stormwater runoff, spillage, or leaks).

(4) Production. If a new source performance standard promulgated under [section 306](#) of CWA or an effluent limitation guideline applies to the applicant and is expressed in terms of production (or other measure of operation), a reasonable measure of the applicant's expected actual production reported in the units used in the applicable effluent guideline or new source performance standard as required by [§ 122.45\(b\)\(2\)](#) for each of the first three years. Alternative estimates may also be submitted if production is likely to vary.

(5) Effluent characteristics. The requirements in paragraphs (h)(4)(i), (ii), and (iii) of this section that an applicant must provide estimates of certain pollutants expected to be present do not apply to pollutants present in a discharge solely as a result of their presence in intake water; however, an applicant must report such pollutants as present. Net credits may be provided for the presence of pollutants in intake water if the requirements of [§ 122.45\(g\)](#) are met. All levels (except for discharge flow, temperature, and pH) must be estimated as concentration and as total mass.

(i) Each applicant must report estimated daily maximum, daily average, and source of information for each outfall for the following pollutants or parameters. The Director may waive the reporting requirements for any of these pollutants and parameters if the applicant submits a request for such a waiver before or with his application which demonstrates that information adequate to support issuance of the permit can be obtained through less stringent reporting requirements.

(A) Biochemical Oxygen Demand (BOD).

(B) Chemical Oxygen Demand (COD).

(C) Total Organic Carbon (TOC).

(D) Total Suspended Solids (TSS).

(E) Flow.

(F) Ammonia (as N).

(G) Temperature (winter and summer).

(H) pH.

(ii) Each applicant must report estimated daily maximum, daily average, and source of information for each outfall for the following pollutants, if the applicant knows or has reason to believe they will be present or if they are limited by an effluent limitation guideline or new source performance standard either directly or indirectly through limitations on an indicator pollutant: all pollutants in table IV of appendix D of part 122 (certain conventional and nonconventional pollutants).

(iii) Each applicant must report estimated daily maximum, daily average and source of information for the following pollutants if he knows or has reason to believe that they will be present in the discharges from any outfall:

(A) The pollutants listed in table III of appendix D (the toxic metals, in the discharge from any outfall: Total cyanide, and total phenols);

(B) The organic toxic pollutants in table II of appendix D (except bis (chloromethyl) ether, dichlorofluoromethane and trichlorofluoromethane). This requirement is waived for applicants with expected gross sales of less than \$100,000 per year for the next three years, and for coal mines with expected average production of less than 100,000 tons of coal per year.

(iv) The applicant is required to report that 2,3,7,8 Tetrachlorodibenzo-P-Dioxin (TCDD) may be discharged if he uses or manufactures one of the following compounds, or if he knows or has reason to believe that TCDD will or may be present in an effluent:

(A) 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) (CAS #93-76-5);

(B) 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5-TP) (CAS #93-72-1);

(C) 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon) (CAS #136-25-4);

(D) 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel) (CAS #299-84-3);

(E) 2,4,5-trichlorophenol (TCP) (CAS #95-95-4); or

(F) Hexachlorophene (HCP) (CAS #70-30-4);

(v) Each applicant must report any pollutants listed in table V of appendix D (certain hazardous substances) if he believes they will be present in any outfall (no quantitative estimates are required unless they are already available).

(vi) No later than two years after the commencement of discharge from the proposed facility, the applicant is required to complete and submit Items V and VI of NPDES application Form 2c (see § 122.21(g)). However, the applicant need not complete those portions of Item V requiring tests which he has already performed and reported under the discharge monitoring requirements of his NPDES permit.

(6) Engineering Report. Each applicant must report the existence of any technical evaluation concerning his wastewater treatment, along with the name and location of similar plants of which he has knowledge.

(7) Other information. Any optional information the permittee wishes to have considered.

(8) Certification. Signature of certifying official under § 122.22.

(l) Special provisions for applications from new sources.

(1) The owner or operator of any facility which may be a new source (as defined in § 122.2) and which is located in a State without an approved NPDES program must comply with the provisions of this paragraph (l)(1).

(2)(i) Before beginning any on-site construction as defined in § 122.29, the owner or operator of any facility which may be a new source must submit information to the Regional Administrator so that he or she can determine if the facility is a new source. The Regional Administrator may request any additional information needed to determine whether the facility is a new source.

(ii) The Regional Administrator shall make an initial determination whether the facility is a new source within 30 days of receiving all necessary information under paragraph (l)(2)(i) of this section.

(3) The Regional Administrator shall issue a public notice in accordance with § 124.10 of this chapter of the new source determination under paragraph (l)(2) of this section. If the Regional Administrator has determined that the facility is a new source, the notice shall state that the applicant must comply with the environmental review requirements of 40 CFR 6.600 through 6.607.

(4) Any interested party may challenge the Regional Administrator's initial new source determination by requesting review of the determination under § 124.19 of this chapter within 30 days of the public notice of the initial determination. If all interested parties agree, the Environmental Appeals Board may defer review until after a final permit decision is made, and consolidate review of the determination with any review of the permit decision.

(m) Variance requests by non-POTWs. A discharger which is not a publicly owned treatment works (POTW) may request a variance from otherwise applicable effluent limitations under any of the following statutory or regulatory provisions within the times specified in this paragraph:

(1) Fundamentally different factors.

(i) A request for a variance based on the presence of “fundamentally different factors” from those on which the effluent limitations guideline was based shall be filed as follows:

(A) For a request from best practicable control technology currently available (BPT), by the close of the public comment period under § 124.10.

(B) For a request from best available technology economically achievable (BAT) and/or best conventional pollutant control technology (BCT), by no later than:

(1) July 3, 1989, for a request based on an effluent limitation guideline promulgated before February 4, 1987, to the extent July 3, 1989 is not later than that provided under previously promulgated regulations; or

(2) 180 days after the date on which an effluent limitation guideline is published in the Federal Register for a request based on an effluent limitation guideline promulgated on or after February 4, 1987.

(ii) The request shall explain how the requirements of the applicable regulatory and/or statutory criteria have been met.

(2) Non-conventional pollutants. A request for a variance from the BAT requirements for CWA section 301(b)(2)(F) pollutants (commonly called “non-conventional” pollutants) pursuant to section 301(c) of CWA because of the economic capability of the owner or operator, or pursuant to section 301(g) of the CWA (provided however that a § 301(g) variance may only be requested for ammonia; chlorine; color; iron; total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by section 301(b)(2)(F)) and any other pollutant which the Administrator lists under section 301(g)(4) of the CWA) must be made as follows:

(i) For those requests for a variance from an effluent limitation based upon an effluent limitation guideline by:

(A) Submitting an initial request to the Regional Administrator, as well as to the State Director if applicable, stating the name of the discharger, the permit number, the outfall number(s), the applicable effluent guideline, and whether the discharger is requesting a section 301(c) or section 301(g) modification or both. This request must have been filed not later than:

(1) September 25, 1978, for a pollutant which is controlled by a BAT effluent limitation guideline promulgated before December 27, 1977; or

(2) 270 days after promulgation of an applicable effluent limitation guideline for guidelines promulgated after December 27, 1977; and

(B) Submitting a completed request no later than the close of the public comment period under § 124.10 demonstrating that the requirements of § 124.13 and the applicable requirements of part 125 have been met.

Notwithstanding this provision, the complete application for a request under [section 301\(g\)](#) shall be filed 180 days before EPA must make a decision (unless the Regional Division Director establishes a shorter or longer period).

(ii) For those requests for a variance from effluent limitations not based on effluent limitation guidelines, the request need only comply with paragraph (m)(2)(i)(B) of this section and need not be preceded by an initial request under paragraph (m)(2)(i)(A) of this section.

(3) [Reserved]

(4) [Reserved]

(5) Water quality related effluent limitations. A modification under [section 302\(b\)\(2\)](#) of requirements under [section 302\(a\)](#) for achieving water quality related effluent limitations may be requested no later than the close of the public comment period under [§ 124.10](#) on the permit from which the modification is sought.

(6) Thermal discharges. A variance under CWA [section 316\(a\)](#) for the thermal component of any discharge must be filed with a timely application for a permit under this section, except that if thermal effluent limitations are established under CWA [section 402\(a\)\(1\)](#) or are based on water quality standards the request for a variance may be filed by the close of the public comment period under [§ 124.10](#). A copy of the request as required under 40 CFR part 125, subpart H, shall be sent simultaneously to the appropriate State or interstate certifying agency as required under 40 CFR part 125. (See [§ 124.65](#) for special procedures for [section 316\(a\)](#) thermal variances.)

(n) Variance requests by POTWs. A discharger which is a publicly owned treatment works (POTW) may request a variance from otherwise applicable effluent limitations under any of the following statutory provisions as specified in this paragraph:

(1) Discharges into marine waters. A request for a modification under CWA [section 301\(h\)](#) of requirements of CWA [section 301\(b\)\(1\)\(B\)](#) for discharges into marine waters must be filed in accordance with the requirements of 40 CFR part 125, subpart G.

(2) [Reserved]

(3) Water quality based effluent limitation. A modification under CWA [section 302\(b\)\(2\)](#) of the requirements under [section 302\(a\)](#) for achieving water quality based effluent limitations shall be requested no later than the close of the public comment period under [§ 124.10](#) on the permit from which the modification is sought.

(o) Expedited variance procedures and time extensions.

(1) Notwithstanding the time requirements in paragraphs (m) and (n) of this section, the Director may notify a permit applicant before a draft permit is issued under [§ 124.6](#) that the draft permit will likely contain limitations

which are eligible for variances. In the notice the Director may require the applicant as a condition of consideration of any potential variance request to submit a request explaining how the requirements of part 125 applicable to the variance have been met and may require its submission within a specified reasonable time after receipt of the notice. The notice may be sent before the permit application has been submitted. The draft or final permit may contain the alternative limitations which may become effective upon final grant of the variance.

(2) A discharger who cannot file a timely complete request required under paragraph (m)(2)(i)(B) or (m)(2)(ii) of this section may request an extension. The extension may be granted or denied at the discretion of the Director. Extensions shall be no more than 6 months in duration.

(p) Recordkeeping. Except for information required by paragraph (d)(3)(ii) of this section, which shall be retained for a period of at least five years from the date the application is signed (or longer as required by 40 CFR part 503), applicants shall keep records of all data used to complete permit applications and any supplemental information submitted under this section for a period of at least 3 years from the date the application is signed.

(q) Sewage sludge management. All TWTDS subject to paragraph (c)(2)(i) of this section must provide the information in this paragraph to the Director, using Form 2S or another application form approved by the Director. New applicants must submit all information available at the time of permit application. The information may be provided by referencing information previously submitted to the Director. The Director may waive any requirement of this paragraph if he or she has access to substantially identical information. The Director may also waive any requirement of this paragraph that is not of material concern for a specific permit, if approved by the Regional Administrator. The waiver request to the Regional Administrator must include the State's justification for the waiver. A Regional Administrator's disapproval of a State's proposed waiver does not constitute final Agency action, but does provide notice to the State and permit applicant(s) that EPA may object to any State-issued permit issued in the absence of the required information.

(1) Facility information. All applicants must submit the following information:

(i) The name, mailing address, and location of the TWTDS for which the application is submitted;

(ii) Whether the facility is a Class I Sludge Management Facility;

(iii) The design flow rate (in million gallons per day);

(iv) The total population served; and

(v) The TWTDS's status as Federal, State, private, public, or other entity;

(2) Applicant information. All applicants must submit the following information:

(i) The name, mailing address, and telephone number of the applicant; and

(ii) Indication whether the applicant is the owner, operator, or both;

(3) Permit information. All applicants must submit the facility's NPDES permit number, if applicable, and a listing of all other Federal, State, and local permits or construction approvals received or applied for under any of the following programs:

(i) Hazardous Waste Management program under the Resource Conservation and Recovery Act (RCRA);

(ii) UIC program under the Safe Drinking Water Act (SDWA);

(iii) NPDES program under the Clean Water Act (CWA);

(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;

(v) Nonattainment program under the Clean Air Act;

(vi) National Emission Standards for Hazardous Air Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;

(vii) Dredge or fill permits under section 404 of CWA;

(viii) Other relevant environmental permits, including State or local permits;

(4) Indian country. All applicants must identify any generation, treatment, storage, land application, or disposal of sewage sludge that occurs in Indian country;

(5) Topographic map. All applicants must submit a topographic map (or other map if a topographic map is unavailable) extending one mile beyond property boundaries of the facility and showing the following information:

(i) All sewage sludge management facilities, including on-site treatment, storage, and disposal sites; and

(ii) Wells, springs, and other surface water bodies that are within ¼ mile of the property boundaries and listed in public records or otherwise known to the applicant;

(6) Sewage sludge handling. All applicants must submit a line drawing and/or a narrative description that identifies all sewage sludge management practices employed during the term of the permit, including all units used for collecting, dewatering, storing, or treating sewage sludge, the destination(s) of all liquids and solids leaving each such unit, and all processes used for pathogen reduction and vector attraction reduction;

(7) Sewage sludge quality. The applicant must submit sewage sludge monitoring data for the pollutants for which limits in sewage sludge have been established in 40 CFR part 503 for the applicant's use or disposal practices on the date of permit application.

(i) The Director may require sampling for additional pollutants, as appropriate, on a case-by-case basis;

(ii) Applicants must provide data from a minimum of three samples taken within four and one-half years prior to the date of the permit application. Samples must be representative of the sewage sludge and should be taken at least one month apart. Existing data may be used in lieu of sampling done solely for the purpose of this application;

(iii) Applicants must collect and analyze samples in accordance with analytical methods approved under SW-846 unless an alternative has been specified in an existing sewage sludge permit;

(iv) The monitoring data provided must include at least the following information for each parameter:

(A) Average monthly concentration for all samples (mg/kg dry weight), based upon actual sample values;

(B) The analytical method used; and

(C) The method detection level.

(8) Preparation of sewage sludge. If the applicant is a "person who prepares" sewage sludge, as defined at [40 CFR 503.9\(r\)](#), the applicant must provide the following information:

(i) If the applicant's facility generates sewage sludge, the total dry metric tons per 365-day period generated at the facility;

(ii) If the applicant's facility receives sewage sludge from another facility, the following information for each facility from which sewage sludge is received:

(A) The name, mailing address, and location of the other facility;

(B) The total dry metric tons per 365-day period received from the other facility; and

(C) A description of any treatment processes occurring at the other facility, including blending activities and treatment to reduce pathogens or vector attraction characteristics;

(iii) If the applicant's facility changes the quality of sewage sludge through blending, treatment, or other activities, the following information:

(A) Whether the Class A pathogen reduction requirements in [40 CFR 503.32\(a\)](#) or the Class B pathogen reduction requirements in [40 CFR 503.32\(b\)](#) are met, and a description of any treatment processes used to reduce pathogens in sewage sludge;

(B) Whether any of the vector attraction reduction options of [40 CFR 503.33\(b\)\(1\)](#) through [\(b\)\(8\)](#) are met, and a description of any treatment processes used to reduce vector attraction properties in sewage sludge; and

(C) A description of any other blending, treatment, or other activities that change the quality of sewage sludge;

(iv) If sewage sludge from the applicant's facility meets the ceiling concentrations in [40 CFR 503.13\(b\)\(1\)](#), the pollutant concentrations in [§ 503.13\(b\)\(3\)](#), the Class A pathogen requirements in [§ 503.32\(a\)](#), and one of the vector attraction reduction requirements in [§ 503.33\(b\)\(1\)](#) through [\(b\)\(8\)](#), and if the sewage sludge is applied to the land, the applicant must provide the total dry metric tons per 365-day period of sewage sludge subject to this paragraph that is applied to the land;

(v) If sewage sludge from the applicant's facility is sold or given away in a bag or other container for application to the land, and the sewage sludge is not subject to paragraph (q)(8)(iv) of this section, the applicant must provide the following information:

(A) The total dry metric tons per 365-day period of sewage sludge subject to this paragraph that is sold or given away in a bag or other container for application to the land; and

(B) A copy of all labels or notices that accompany the sewage sludge being sold or given away;

(vi) If sewage sludge from the applicant's facility is provided to another "person who prepares," as defined at [40 CFR 503.9\(r\)](#), and the sewage sludge is not subject to paragraph (q)(8)(iv) of this section, the applicant must provide the following information for each facility receiving the sewage sludge:

(A) The name and mailing address of the receiving facility;

(B) The total dry metric tons per 365-day period of sewage sludge subject to this paragraph that the applicant provides to the receiving facility;

(C) A description of any treatment processes occurring at the receiving facility, including blending activities and treatment to reduce pathogens or vector attraction characteristic;

(D) A copy of the notice and necessary information that the applicant is required to provide the receiving facility under [40 CFR 503.12\(g\)](#); and

(E) If the receiving facility places sewage sludge in bags or containers for sale or give-away to application to the land, a copy of any labels or notices that accompany the sewage sludge;

(9) Land application of bulk sewage sludge. If sewage sludge from the applicant's facility is applied to the land in bulk form, and is not subject to paragraphs (q)(8)(iv), (v), or (vi) of this section, the applicant must provide the following information:

(i) The total dry metric tons per 365-day period of sewage sludge subject to this paragraph that is applied to the land;

(ii) If any land application sites are located in States other than the State where the sewage sludge is prepared, a description of how the applicant will notify the permitting authority for the State(s) where the land application sites are located;

(iii) The following information for each land application site that has been identified at the time of permit application:

(A) The name (if any), and location for the land application site;

(B) The site's latitude and longitude to the nearest second, and method of determination;

(C) A topographic map (or other map if a topographic map is unavailable) that shows the site's location;

(D) The name, mailing address, and telephone number of the site owner, if different from the applicant;

(E) The name, mailing address, and telephone number of the person who applies sewage sludge to the site, if different from the applicant;

(F) Whether the site is agricultural land, forest, a public contact site, or a reclamation site, as such site types are defined under [40 CFR 503.11](#);

(G) The type of vegetation grown on the site, if known, and the nitrogen requirement for this vegetation;

(H) Whether either of the vector attraction reduction options of [40 CFR 503.33\(b\)\(9\)](#) or [\(b\)\(10\)](#) is met at the site, and a description of any procedures employed at the time of use to reduce vector attraction properties in sewage sludge; and

- (I) Other information that describes how the site will be managed, as specified by the permitting authority.
- (iv) The following information for each land application site that has been identified at the time of permit application, if the applicant intends to apply bulk sewage sludge subject to the cumulative pollutant loading rates in [40 CFR 503.13\(b\)\(2\)](#) to the site:
- (A) Whether the applicant has contacted the permitting authority in the State where the bulk sewage sludge subject to [§ 503.13\(b\)\(2\)](#) will be applied, to ascertain whether bulk sewage sludge subject to [§ 503.13\(b\)\(2\)](#) has been applied to the site on or since July 20, 1993, and if so, the name of the permitting authority and the name and phone number of a contact person at the permitting authority;
- (B) Identification of facilities other than the applicant's facility that have sent, or are sending, sewage sludge subject to the cumulative pollutant loading rates in [§ 503.13\(b\)\(2\)](#) to the site since July 20, 1993, if, based on the inquiry in paragraph (q)(iv)(A), bulk sewage sludge subject to cumulative pollutant loading rates in [§ 503.13\(b\)\(2\)](#) has been applied to the site since July 20, 1993;
- (v) If not all land application sites have been identified at the time of permit application, the applicant must submit a land application plan that, at a minimum:
- (A) Describes the geographical area covered by the plan;
- (B) Identifies the site selection criteria;
- (C) Describes how the site(s) will be managed;
- (D) Provides for advance notice to the permit authority of specific land application sites and reasonable time for the permit authority to object prior to land application of the sewage sludge; and
- (E) Provides for advance public notice of land application sites in the manner prescribed by State and local law. When State or local law does not require advance public notice, it must be provided in a manner reasonably calculated to apprise the general public of the planned land application.
- (10) Surface disposal. If sewage sludge from the applicant's facility is placed on a surface disposal site, the applicant must provide the following information:
- (i) The total dry metric tons of sewage sludge from the applicant's facility that is placed on surface disposal sites per 365-day period;
- (ii) The following information for each surface disposal site receiving sewage sludge from the applicant's facility that the applicant does not own or operate:

(A) The site name or number, contact person, mailing address, and telephone number for the surface disposal site; and

(B) The total dry metric tons from the applicant's facility per 365-day period placed on the surface disposal site;

(iii) The following information for each active sewage sludge unit at each surface disposal site that the applicant owns or operates:

(A) The name or number and the location of the active sewage sludge unit;

(B) The unit's latitude and longitude to the nearest second, and method of determination;

(C) If not already provided, a topographic map (or other map if a topographic map is unavailable) that shows the unit's location;

(D) The total dry metric tons placed on the active sewage sludge unit per 365-day period;

(E) The total dry metric tons placed on the active sewage sludge unit over the life of the unit;

(F) A description of any liner for the active sewage sludge unit, including whether it has a maximum permeability of 1×10^{-7} cm/sec;

(G) A description of any leachate collection system for the active sewage sludge unit, including the method used for leachate disposal, and any Federal, State, and local permit number(s) for leachate disposal;

(H) If the active sewage sludge unit is less than 150 meters from the property line of the surface disposal site, the actual distance from the unit boundary to the site property line;

(I) The remaining capacity (dry metric tons) for the active sewage sludge unit;

(J) The date on which the active sewage sludge unit is expected to close, if such a date has been identified;

(K) The following information for any other facility that sends sewage sludge to the active sewage sludge unit:

(1) The name, contact person, and mailing address of the facility; and

(2) Available information regarding the quality of the sewage sludge received from the facility, including any treatment at the facility to reduce pathogens or vector attraction characteristics;

(L) Whether any of the vector attraction reduction options of 40 CFR 503.33(b)(9) through (b)(11) is met at the active sewage sludge unit, and a description of any procedures employed at the time of disposal to reduce vector attraction properties in sewage sludge;

(M) The following information, as applicable to any ground-water monitoring occurring at the active sewage sludge unit:

(1) A description of any ground-water monitoring occurring at the active sewage sludge unit;

(2) Any available ground-water monitoring data, with a description of the well locations and approximate depth to ground water;

(3) A copy of any ground-water monitoring plan that has been prepared for the active sewage sludge unit;

(4) A copy of any certification that has been obtained from a qualified ground-water scientist that the aquifer has not been contaminated; and

(N) If site-specific pollutant limits are being sought for the sewage sludge placed on this active sewage sludge unit, information to support such a request;

(11) Incineration. If sewage sludge from the applicant's facility is fired in a sewage sludge incinerator, the applicant must provide the following information:

(i) The total dry metric tons of sewage sludge from the applicant's facility that is fired in sewage sludge incinerators per 365-day period;

(ii) The following information for each sewage sludge incinerator firing the applicant's sewage sludge that the applicant does not own or operate:

(A) The name and/or number, contact person, mailing address, and telephone number of the sewage sludge incinerator; and

(B) The total dry metric tons from the applicant's facility per 365-day period fired in the sewage sludge incinerator;

(iii) The following information for each sewage sludge incinerator that the applicant owns or operates:

- (A) The name and/or number and the location of the sewage sludge incinerator;
- (B) The incinerator's latitude and longitude to the nearest second, and method of determination;
- (C) The total dry metric tons per 365-day period fired in the sewage sludge incinerator;
- (D) Information, test data, and documentation of ongoing operating parameters indicating that compliance with the National Emission Standard for Beryllium in 40 CFR part 61 will be achieved;
- (E) Information, test data, and documentation of ongoing operating parameters indicating that compliance with the National Emission Standard for Mercury in 40 CFR part 61 will be achieved;
- (F) The dispersion factor for the sewage sludge incinerator, as well as modeling results and supporting documentation;
- (G) The control efficiency for parameters regulated in [40 CFR 503.43](#), as well as performance test results and supporting documentation;
- (H) Information used to calculate the risk specific concentration (RSC) for chromium, including the results of incinerator stack tests for hexavalent and total chromium concentrations, if the applicant is requesting a chromium limit based on a site-specific RSC value;
- (I) Whether the applicant monitors total hydrocarbons (THC) or Carbon Monoxide (CO) in the exit gas for the sewage sludge incinerator;
- (J) The type of sewage sludge incinerator;
- (K) The maximum performance test combustion temperature, as obtained during the performance test of the sewage sludge incinerator to determine pollutant control efficiencies;
- (L) The following information on the sewage sludge feed rate used during the performance test:
 - (1) Sewage sludge feed rate in dry metric tons per day;
 - (2) Identification of whether the feed rate submitted is average use or maximum design; and
 - (3) A description of how the feed rate was calculated;

(M) The incinerator stack height in meters for each stack, including identification of whether actual or creditable stack height was used;

(N) The operating parameters for the sewage sludge incinerator air pollution control device(s), as obtained during the performance test of the sewage sludge incinerator to determine pollutant control efficiencies;

(O) Identification of the monitoring equipment in place, including (but not limited to) equipment to monitor the following:

(1) Total hydrocarbons or Carbon Monoxide;

(2) Percent oxygen;

(3) Percent moisture; and

(4) Combustion temperature; and

(P) A list of all air pollution control equipment used with this sewage sludge incinerator;

(12) Disposal in a municipal solid waste landfill. If sewage sludge from the applicant's facility is sent to a municipal solid waste landfill (MSWLF), the applicant must provide the following information for each MSWLF to which sewage sludge is sent:

(i) The name, contact person, mailing address, location, and all applicable permit numbers of the MSWLF;

(ii) The total dry metric tons per 365-day period sent from this facility to the MSWLF;

(iii) A determination of whether the sewage sludge meets applicable requirements for disposal of sewage sludge in a MSWLF, including the results of the paint filter liquids test and any additional requirements that apply on a site-specific basis; and

(iv) Information, if known, indicating whether the MSWLF complies with criteria set forth in 40 CFR part 258;

(13) Contractors. All applicants must provide the name, mailing address, telephone number, and responsibilities of all contractors responsible for any operational or maintenance aspects of the facility related to sewage sludge generation, treatment, use, or disposal;

(14) Other information. At the request of the permitting authority, the applicant must provide any other information necessary to determine the appropriate standards for permitting under 40 CFR part 503, and must provide any other information necessary to assess the sewage sludge use and disposal practices, determine whether to issue a permit, or identify appropriate permit requirements; and

(15) Signature. All applications must be signed by a certifying official in compliance with § 122.22.

(r) Applications for facilities with cooling water intake structures—

(1)(i) New facilities with new or modified cooling water intake structures. New facilities (other than offshore oil and gas extraction facilities) with cooling water intake structures as defined in part 125, subpart I of this chapter, must submit to the Director for review the information required under paragraphs (r)(2) (except (r)(2)(iv)), (3), and (4) (except (r)(4)(ix), (x), (xi), and (xii)) of this section and § 125.86 of this chapter as part of the permit application. New offshore oil and gas extraction facilities with cooling water intake structures as defined in part 125, subpart N, of this chapter that are fixed facilities must submit to the Director for review the information required under paragraphs (r)(2) (except (r)(2)(iv)), (3), and (4) (except (r)(4)(ix), (x), (xi), and (xii)) of this section and § 125.136 of this chapter as part of their permit application.

(ii) Existing facilities.

(A) All existing facilities. The owner or operator of an existing facility defined at 40 CFR 125.92(k) must submit to the Director for review the information required under paragraphs (r)(2) and (3) of this section and applicable provisions of paragraphs (r)(4), (5), (6), (7), and (8) of this section.

(B) Existing facilities greater than 125 mgd AIF. In addition, the owner or operator of an existing facility that withdraws greater than 125 mgd actual intake flow (AIF), as defined at 40 CFR 125.92 (a), of water for cooling purposes must also submit to the Director for review the information required under paragraphs (r)(9), (10), (11), (12), and (13) of this section. If the owner or operator of an existing facility intends to comply with the BTA (best technology available) standards for entrainment using a closed-cycle recirculating system as defined at 40 CFR 125.92(c), the Director may reduce or waive some or all of the information required under paragraphs (r)(9) through (13) of this section.

(C) Additional information. The owner or operator of an existing facility must also submit such additional information as the Director determines is necessary pursuant to 40 CFR 125.98(i).

(D) New units at existing facilities. The owner or operator of a new unit at an existing facility, as defined at 40 CFR 125.92(u), must submit or update any information previously provided to the Director by submitting the information required under paragraphs (r)(2), (3), (5), (8), and (14) of this section and applicable provisions of paragraphs (r)(4), (6), and (7) of this section. Requests for and approvals of alternative requirements sought under 40 CFR 125.94(e)(2) or 125.98(b)(7) must be submitted with the permit application.

(E) New units at existing facilities not previously subject to Part 125. The owner or operator of a new unit as defined at [40 CFR 125.92\(u\)](#) at an existing facility not previously subject to part 125 of this chapter that increases the total capacity of the existing facility to more than 2 mgd DIF must submit the information required under paragraphs (r)(2), (3), (5), and (8) of this section and applicable provisions of paragraphs (r)(4), (6), and (7) of this section at the time of the permit application for the new unit. Requests for alternative requirements under [40 CFR 125.94\(e\)\(2\)](#) or [125.98\(b\)\(7\)](#) must be submitted with the permit application. If the total capacity of the facility will increase to more than 125 mgd AIF, the owner or operator must also submit the information required in paragraphs (r)(9) through (13) of this section. If the owner or operator of an existing facility intends to comply with the BTA (best technology available) standards for entrainment using a closed-cycle recirculating system as defined at [40 CFR 125.92\(c\)](#), the Director may reduce or waive some or all of the information required under paragraphs (r)(9) through (13) of this section.

(F) If the owner or operator of an existing facility plans to retire the facility before the current permit expires, then the requirements of paragraphs (r)(1)(ii)(A), (B), (C), (D), and (E) of this section do not apply.

(G) If the owner or operator of an existing facility plans to retire the facility after the current permit expires but within one permit cycle, then the Director may waive the requirements of paragraphs (r)(7), (9), (10), (11), (12), and (13) of this section pending a signed certification statement from the owner or operator of the facility specifying the last operating date of the facility.

(H) All facilities. The owner or operator of any existing facility or new unit at any existing facility must also submit with its permit application all information received as a result of any communication with a Field Office of the Fish and Wildlife Service and/or Regional Office of the National Marine Fisheries Service.

(2) Source water physical data. These include:

(i) A narrative description and scaled drawings showing the physical configuration of all source water bodies used by your facility, including areal dimensions, depths, salinity and temperature regimes, and other documentation that supports your determination of the water body type where each cooling water intake structure is located;

(ii) Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods you used to conduct any physical studies to determine your intake's area of influence within the waterbody and the results of such studies;

(iii) Locational maps; and

(iv) For new offshore oil and gas facilities that are not fixed facilities, a narrative description and/or locational maps providing information on predicted locations within the waterbody during the permit term in sufficient detail for the Director to determine the appropriateness of additional impingement requirements under [§ 125.134\(b\)\(4\)](#).

(3) Cooling water intake structure data. These include:

(i) A narrative description of the configuration of each of your cooling water intake structures and where it is located in the water body and in the water column;

(ii) Latitude and longitude in degrees, minutes, and seconds for each of your cooling water intake structures;

(iii) A narrative description of the operation of each of your cooling water intake structures, including design intake flows, daily hours of operation, number of days of the year in operation and seasonal changes, if applicable;

(iv) A flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges; and

(v) Engineering drawings of the cooling water intake structure.

(4) Source water baseline biological characterization data. This information is required to characterize the biological community in the vicinity of the cooling water intake structure and to characterize the operation of the cooling water intake structures. The Director may also use this information in subsequent permit renewal proceedings to determine if your Design and Construction Technology Plan as required in § 125.86(b)(4) or § 125.136(b)(3) of this chapter should be revised. This supporting information must include existing data (if they are available). However, you may supplement the data using newly conducted field studies if you choose to do so. The information you submit must include:

(i) A list of the data in paragraphs (r)(4)(ii) through (vi) of this section that are not available and efforts made to identify sources of the data;

(ii) A list of species (or relevant taxa) for all life stages and their relative abundance in the vicinity of the cooling water intake structure;

(iii) Identification of the species and life stages that would be most susceptible to impingement and entrainment. Species evaluated should include the forage base as well as those most important in terms of significance to commercial and recreational fisheries;

(iv) Identification and evaluation of the primary period of reproduction, larval recruitment, and period of peak abundance for relevant taxa;

(v) Data representative of the seasonal and daily activities (e.g., feeding and water column migration) of biological organisms in the vicinity of the cooling water intake structure;

(vi) Identification of all threatened, endangered, and other protected species that might be susceptible to impingement and entrainment at your cooling water intake structures;

(vii) Documentation of any public participation or consultation with Federal or State agencies undertaken in development of the plan; and

(viii) If you supplement the information requested in paragraph (r)(4)(i) of this section with data collected using field studies, supporting documentation for the Source Water Baseline Biological Characterization must include a description of all methods and quality assurance procedures for sampling, and data analysis including a description of the study area; taxonomic identification of sampled and evaluated biological assemblages (including all life stages of fish and shellfish); and sampling and data analysis methods. The sampling and/or data analysis methods you use must be appropriate for a quantitative survey and based on consideration of methods used in other biological studies performed within the same source water body. The study area should include, at a minimum, the area of influence of the cooling water intake structure.

(ix) In the case of the owner or operator of an existing facility or new unit at an existing facility, the Source Water Baseline Biological Characterization Data is the information in paragraphs (r)(4)(i) through (xii) of this section.

(x) For the owner or operator of an existing facility, identification of protective measures and stabilization activities that have been implemented, and a description of how these measures and activities affected the baseline water condition in the vicinity of the intake.

(xi) For the owner or operator of an existing facility, a list of fragile species, as defined at [40 CFR 125.92\(m\)](#), at the facility. The applicant need only identify those species not already identified as fragile at [40 CFR 125.92\(m\)](#). New units at an existing facility are not required to resubmit this information if the cooling water withdrawals for the operation of the new unit are from an existing intake.

(xii) For the owner or operator of an existing facility that has obtained incidental take exemption or authorization for its cooling water intake structure(s) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, any information submitted in order to obtain that exemption or authorization may be used to satisfy the permit application information requirement of paragraph [40 CFR 125.95\(f\)](#) if included in the application.

(5) Cooling Water System Data. The owner or operator of an existing facility must submit the following information for each cooling water intake structure used or intended to be used:

(i) A narrative description of the operation of the cooling water system and its relationship to cooling water intake structures; the proportion of the design intake flow that is used in the system; the number of days of the year the cooling water system is in operation and seasonal changes in the operation of the system, if applicable; the proportion of design intake flow for contact cooling, non-contact cooling, and process uses; a distribution of water reuse to include cooling water reused as process water, process water reused for cooling, and the use of gray water for cooling; a description of reductions in total water withdrawals including cooling water intake flow reductions already achieved through minimized process water withdrawals; a description of any cooling water that is used in a manufacturing process either before or after it is used for cooling, including other recycled process water flows; the proportion of the source waterbody withdrawn (on a monthly basis);

(ii) Design and engineering calculations prepared by a qualified professional and supporting data to support the description required by paragraph (r)(5)(i) of this section; and

(iii) Description of existing impingement and entrainment technologies or operational measures and a summary of their performance, including but not limited to reductions in impingement mortality and entrainment due to intake location and reductions in total water withdrawals and usage.

(6) Chosen Method(s) of Compliance with Impingement Mortality Standard. The owner or operator of the facility must identify the chosen compliance method for the entire facility; alternatively, the applicant must identify the chosen compliance method for each cooling water intake structure at its facility. The applicant must identify any intake structure for which a BTA determination for Impingement Mortality under [40 CFR 125.94 \(c\)\(11\) or \(12\)](#) is requested. In addition, the owner or operator that chooses to comply via [40 CFR 125.94 \(c\)\(5\) or \(6\)](#) must also submit an impingement technology performance optimization study as described below:

(i) If the applicant chooses to comply with [40 CFR 125.94\(c\)\(5\)](#), subject to the flexibility for timing provided in [40 CFR 125.95\(a\)\(2\)](#), the impingement technology performance optimization study must include two years of biological data collection measuring the reduction in impingement mortality achieved by the modified traveling screens as defined at [40 CFR 125.92\(s\)](#) and demonstrating that the operation has been optimized to minimize impingement mortality. A complete description of the modified traveling screens and associated equipment must be included, including, for example, type of mesh, mesh slot size, pressure sprays and fish return mechanisms. A description of any biological data collection and data collection approach used in measuring impingement mortality must be included:

(A) Collecting data no less frequently than monthly. The Director may establish more frequent data collection;

(B) Biological data collection representative of the impingement and the impingement mortality at the intakes subject to this provision;

(C) A taxonomic identification to the lowest taxon possible of all organisms collected;

(D) The method in which naturally moribund organisms are identified and taken into account;

(E) The method in which mortality due to holding times is taken into account;

(F) If the facility entraps fish or shellfish, a count of entrapment, as defined at [40 CFR 125.92\(j\)](#), as impingement mortality; and

(G) The percent impingement mortality reflecting optimized operation of the modified traveling screen and all supporting calculations.

(ii) If the applicant chooses to comply with [40 CFR 125.94\(c\)\(6\)](#), the impingement technology performance optimization study must include biological data measuring the reduction in impingement mortality achieved by operation of the system of technologies, operational measures and best management practices, and demonstrating that operation of the system has been optimized to minimize impingement mortality. This system of technologies, operational measures and best management practices may include flow reductions, seasonal operation, unit closure, credit for intake location, and behavioral deterrent systems. The applicant must document how each system element contributes to the system's performance. The applicant must include a minimum of two years of biological data measuring the reduction in impingement mortality achieved by the system. The applicant must also include a description of any sampling or data collection approach used in measuring the rate of impingement, impingement mortality, or flow reductions.

(A) Rate of Impingement. If the demonstration relies in part on a credit for reductions in the rate of impingement in the system, the applicant must provide an estimate of those reductions to be used as credit towards reducing impingement mortality, and any relevant supporting documentation, including previously collected biological data, performance reviews, and previously conducted performance studies not already submitted to the Director. The submission of studies more than 10 years old must include an explanation of why the data are still relevant and representative of conditions at the facility and explain how the data should be interpreted using the definitions of impingement and entrapment at [40 CFR 125.92\(n\)](#) and [\(j\)](#), respectively. The estimated reductions in rate of impingement must be based on a comparison of the system to a once-through cooling system with a traveling screen whose point of withdrawal from the surface water source is located at the shoreline of the source waterbody. For impoundments that are waters of the United States in whole or in part, the facility's rate of impingement must be measured at a location within the cooling water intake system that the Director deems appropriate. In addition, the applicant must include two years of biological data collection demonstrating the rate of impingement resulting from the system. For this demonstration, the applicant must collect data no less frequently than monthly. The Director may establish more frequent data collection.

(B) Impingement Mortality. If the demonstration relies in part on a credit for reductions in impingement mortality already obtained at the facility, the applicant must include two years of biological data collection demonstrating the level of impingement mortality the system is capable of achieving. The applicant must submit any relevant supporting documentation, including previously collected biological data, performance reviews, and previously conducted performance studies not already submitted to the Director. The applicant must provide a description of any sampling or data collection approach used in measuring impingement mortality. In addition, for this demonstration the applicant must:

- (1) Collect data no less frequently than monthly. The Director may establish more frequent data collection;
- (2) Conduct biological data collection that is representative of the impingement and the impingement mortality at an intake subject to this provision. In addition, the applicant must describe how the location of the cooling water intake structure in the waterbody and the water column are accounted for in the points of data collection;
- (3) Include a taxonomic identification to the lowest taxon possible of all organisms to be collected;
- (4) Describe the method in which naturally moribund organisms are identified and taken into account;

(5) Describe the method in which mortality due to holding times is taken into account; and

(6) If the facility entraps fish or shellfish, a count of the entrapment, as defined at [40 CFR 125.92\(j\)](#), as impingement mortality.

(C) Flow reduction. If the demonstration relies in part on flow reduction to reduce impingement, the applicant must include two years of intake flows, measured daily, as part of the demonstration, and describe the extent to which flow reductions are seasonal or intermittent. The applicant must document how the flow reduction results in reduced impingement. In addition, the applicant must describe how the reduction in impingement has reduced impingement mortality.

(D) Total system performance. The applicant must document the percent impingement mortality reflecting optimized operation of the total system of technologies, operational measures, and best management practices and all supporting calculations. The total system performance is the combination of the impingement mortality performance reflected in paragraphs (r)(6)(ii)(A), (B), and (C) of this section.

(7) Entrainment Performance Studies. The owner or operator of an existing facility must submit any previously conducted studies or studies obtained from other facilities addressing technology efficacy, through-facility entrainment survival, and other entrainment studies. Any such submittals must include a description of each study, together with underlying data, and a summary of any conclusions or results. Any studies conducted at other locations must include an explanation as to why the data from other locations are relevant and representative of conditions at your facility. In the case of studies more than 10 years old, the applicant must explain why the data are still relevant and representative of conditions at the facility and explain how the data should be interpreted using the definition of entrainment at [40 CFR 125.92\(h\)](#).

(8) Operational Status. The owner or operator of an existing facility must submit a description of the operational status of each generating, production, or process unit that uses cooling water, including but not limited to:

(i) For power production or steam generation, descriptions of individual unit operating status including age of each unit, capacity utilization rate (or equivalent) for the previous 5 years, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors, including identification of any operating unit with a capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period, and any major upgrades completed within the last 15 years, including but not limited to boiler replacement, condenser replacement, turbine replacement, or changes to fuel type;

(ii) Descriptions of completed, approved, or scheduled uprates and Nuclear Regulatory Commission relicensing status of each unit at nuclear facilities;

(iii) For process units at your facility that use cooling water other than for power production or steam generation, if you intend to use reductions in flow or changes in operations to meet the requirements of [40 CFR 125.94\(c\)](#), descriptions of individual production processes and product lines, operating status including age of each line, seasonal operation, including any extended or unusual outages that significantly affect current data for flow,

impingement, entrainment, or other factors, any major upgrades completed within the last 15 years, and plans or schedules for decommissioning or replacement of process units or production processes and product lines;

(iv) For all manufacturing facilities, descriptions of current and future production schedules; and

(v) Descriptions of plans or schedules for any new units planned within the next 5 years.

(9) Entrainment Characterization Study. The owner or operator of an existing facility that withdraws greater than 125 mgd AIF, where the withdrawal of cooling water is measured at a location within the cooling water intake structure that the Director deems appropriate, must develop for submission to the Director an Entrainment Characterization Study that includes a minimum of two years of entrainment data collection. The Entrainment Characterization Study must include the following components:

(i) Entrainment Data Collection Method. The study should identify and document the data collection period and frequency. The study should identify and document organisms collected to the lowest taxon possible of all life stages of fish and shellfish that are in the vicinity of the cooling water intake structure(s) and are susceptible to entrainment, including any organisms identified by the Director, and any species protected under Federal, State, or Tribal law, including threatened or endangered species with a habitat range that includes waters in the vicinity of the cooling water intake structure. Biological data collection must be representative of the entrainment at the intakes subject to this provision. The owner or operator of the facility must identify and document how the location of the cooling water intake structure in the waterbody and the water column are accounted for by the data collection locations;

(ii) Biological Entrainment Characterization. Characterization of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species), including a description of their abundance and their temporal and spatial characteristics in the vicinity of the cooling water intake structure(s), based on sufficient data to characterize annual, seasonal, and diel variations in entrainment, including but not limited to variations related to climate and weather differences, spawning, feeding, and water column migration. This characterization may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Identification of all life stages of fish and shellfish must include identification of any surrogate species used, and identification of data representing both motile and non-motile life-stages of organisms;

(iii) Analysis and Supporting Documentation. Documentation of the current entrainment of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species). The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Entrainment data to support the facility's calculations must be collected during periods of representative operational flows for the cooling water intake structure, and the flows associated with the data collection must be documented. The method used to determine latent mortality along with data for specific organism mortality or survival that is applied to other life-stages or species must be identified. The owner or operator of the facility must identify and document all assumptions and calculations used to determine the total entrainment for that facility together with all methods and quality assurance/quality control procedures for data collection and data analysis. The proposed data collection and data analysis methods must be appropriate for a quantitative survey.

(10) Comprehensive Technical Feasibility and Cost Evaluation Study. The owner or operator of an existing facility that withdraws greater than 125 mgd AIF must develop for submission to the Director an engineering study of

the technical feasibility and incremental costs of candidate entrainment control technologies. In addition, the study must include the following:

(i) Technical feasibility. An evaluation of the technical feasibility of closed-cycle recirculating systems as defined at 40 CFR 125.92(c), fine mesh screens with a mesh size of 2 millimeters or smaller, and water reuse or alternate sources of cooling water. In addition, this study must include:

(A) A description of all technologies and operational measures considered (including alternative designs of closed-cycle recirculating systems such as natural draft cooling towers, mechanical draft cooling towers, hybrid designs, and compact or multi-cell arrangements);

(B) A discussion of land availability, including an evaluation of adjacent land and acres potentially available due to generating unit retirements, production unit retirements, other buildings and equipment retirements, and potential for repurposing of areas devoted to ponds, coal piles, rail yards, transmission yards, and parking lots;

(C) A discussion of available sources of process water, grey water, waste water, reclaimed water, or other waters of appropriate quantity and quality for use as some or all of the cooling water needs of the facility; and

(D) Documentation of factors other than cost that may make a candidate technology impractical or infeasible for further evaluation.

(ii) Other entrainment control technologies. An evaluation of additional technologies for reducing entrainment may be required by the Director.

(iii) Cost evaluations. The study must include engineering cost estimates of all technologies considered in paragraphs (r)(10)(i) and (ii) of this section. Facility costs must also be adjusted to estimate social costs. All costs must be presented as the net present value (NPV) and the corresponding annual value. Costs must be clearly labeled as compliance costs or social costs. The applicant must separately discuss facility level compliance costs and social costs, and provide documentation as follows:

(A) Compliance costs are calculated as after-tax, while social costs are calculated as pre-tax. Compliance costs include the facility's administrative costs, including costs of permit application, while the social cost adjustment includes the Director's administrative costs. Any outages, downtime, or other impacts to facility net revenue, are included in compliance costs, while only that portion of lost net revenue that does not accrue to other producers can be included in social costs. Social costs must also be discounted using social discount rates of 3 percent and 7 percent. Assumptions regarding depreciation schedules, tax rates, interest rates, discount rates and related assumptions must be identified;

(B) Costs and explanation of any additional facility modifications necessary to support construction and operation of technologies considered in paragraphs (r)(10)(i) and (ii) of this section, including but not limited to relocation of existing buildings or equipment, reinforcement or upgrading of existing equipment, and additional construction and operating permits. Assumptions regarding depreciation schedules, interest rates, discount rates, useful life of the technology considered, and any related assumptions must be identified; and

(C) Costs and explanation for addressing any non-water quality environmental and other impacts identified in paragraph (r)(12) of this section. The cost evaluation must include a discussion of all reasonable attempts to mitigate each of these impacts.

(11) **Benefits Valuation Study.** The owner or operator of an existing facility that withdraws greater than 125 mgd AIF must develop for submission to the Director an evaluation of the benefits of the candidate entrainment reduction technologies and operational measures evaluated in paragraph (r)(10) of this section including using the Entrainment Characterization Study completed in paragraph (r)(9) of this section. Each category of benefits must be described narratively, and when possible, benefits should be quantified in physical or biological units and monetized using appropriate economic valuation methods. The benefits valuation study must include, but is not limited to, the following elements:

(i) Incremental changes in the numbers of individual fish and shellfish lost due to impingement mortality and entrainment as defined in [40 CFR 125.92](#), for all life stages of each exposed species;

(ii) Description of basis for any estimates of changes in the stock sizes or harvest levels of commercial and recreational fish or shellfish species or forage fish species;

(iii) Description of basis for any monetized values assigned to changes in the stock size or harvest levels of commercial and recreational fish or shellfish species, forage fish, and to any other ecosystem or non use benefits;

(iv) A discussion of mitigation efforts completed prior to October 14, 2014 including how long they have been in effect and how effective they have been;

(v) Discussion, with quantification and monetization, where possible, of any other benefits expected to accrue to the environment and local communities, including but not limited to improvements for mammals, birds, and other organisms and aquatic habitats;

(vi) Discussion, with quantification and monetization, where possible, of any benefits expected to result from any reductions in thermal discharges from entrainment technologies.

(12) **Non-water Quality Environmental and Other Impacts Study.** The owner or operator of an existing facility that withdraws greater than 125 mgd AIF must develop for submission to the Director a detailed facility-specific discussion of the changes in non-water quality environmental and other impacts attributed to each technology and operational measure considered in paragraph (r)(10) of this section, including both impacts increased and impacts decreased. The study must include the following:

(i) Estimates of changes to energy consumption, including but not limited to auxiliary power consumption and turbine backpressure energy penalty;

(ii) Estimates of air pollutant emissions and of the human health and environmental impacts associated with such emissions;

(iii) Estimates of changes in noise;

(iv) A discussion of impacts to safety, including documentation of the potential for plumes, icing, and availability of emergency cooling water;

(v) A discussion of facility reliability, including but not limited to facility availability, production of steam, impacts to production based on process unit heating or cooling, and reliability due to cooling water availability;

(vi) Significant changes in consumption of water, including a facility-specific comparison of the evaporative losses of both once-through cooling and closed-cycle recirculating systems, and documentation of impacts attributable to changes in water consumption; and

(vii) A discussion of all reasonable attempts to mitigate each of these factors.

(13) Peer Review. If the applicant is required to submit studies under paragraphs (r)(10) through (12) of this section, the applicant must conduct an external peer review of each report to be submitted with the permit application. The applicant must select peer reviewers and notify the Director in advance of the peer review. The Director may disapprove of a peer reviewer or require additional peer reviewers. The Director may confer with EPA, Federal, State and Tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by the cooling water intake structure, independent system operators, and state public utility regulatory agencies, to determine which peer review comments must be addressed. The applicant must provide an explanation for any significant reviewer comments not accepted. Peer reviewers must have appropriate qualifications and their names and credentials must be included in the peer review report.

(14) New Units. The applicant must identify the chosen compliance method for the new unit. In addition, the owner or operator that selects the BTA standards for new units at [40 CFR 125.94 \(e\)\(2\)](#) as its route to compliance must submit information to demonstrate entrainment reductions equivalent to 90 percent or greater of the reduction that could be achieved through compliance with [40 CFR 125.94\(e\)\(1\)](#). The demonstration must include the Entrainment Characterization Study at paragraph (r)(9) of this section. In addition, if data specific to your facility indicates that compliance with the requirements of [§ 125.94](#) of this chapter for each new unit would result in compliance costs wholly out of proportion to the costs EPA considered in establishing the requirements at issue, or would result in significant adverse impacts on local air quality, significant adverse impacts on local water resources other than impingement or entrainment, or significant adverse impacts on local energy markets, you must submit all supporting data as part of paragraph (r)(14) of this section. The Director may determine that additional data and information, including but not limited to monitoring, must be included as part of paragraph (r)(14) of this section.

Credits

[[49 FR 31842](#), Aug. 8, 1984; [49 FR 38046](#), Sept. 26, 1984; [50 FR 4514](#), Jan. 31, 1985; [50 FR 6940, 6941](#), Feb. 19, 1985; [50 FR 35203](#), Aug. 29, 1985; [51 FR 26991](#), July 28, 1986; [53 FR 4158](#), Feb. 12, 1988; [53 FR 33007](#), Aug. 29, 1988; [54 FR 254](#), Jan. 4, 1989; [54 FR 18782](#), May 2, 1989; [55 FR 30128](#), July 24, 1990; [55 FR 48062](#), Nov. 16, 1990; [58 FR 9413](#),

Feb. 19, 1993; [60 FR 17956](#), April 7, 1995; [60 FR 33931](#), June 29, 1995; [60 FR 40235](#), Aug. 7, 1995; [64 FR 42462](#), Aug. 4, 1999; [64 FR 43426](#), Aug. 10, 1999; [64 FR 68838](#), Dec. 8, 1999; [65 FR 30905](#), May 15, 2000; [66 FR 65337](#), Dec. 18, 2001; [68 FR 7265](#), Feb. 12, 2003; [69 FR 41682](#), July 9, 2004; [70 FR 60191](#), Oct. 14, 2005; [71 FR 6983](#), Feb. 10, 2006; [71 FR 35039](#), June 16, 2006; [72 FR 11211](#), March 12, 2007; [72 FR 37109](#), July 9, 2007; [72 FR 40250](#), July 24, 2007; [73 FR 70480](#), Nov. 20, 2008; [79 FR 48424](#), Aug. 15, 2014; [79 FR 49013](#), Aug. 19, 2014; [79 FR 56275](#), Sept. 19, 2014]

SOURCE: [45 FR 33418](#), May 19, 1980, as amended at [48 FR 14153](#), Apr. 1, 1983, unless otherwise noted.

AUTHORITY: The Clean Water Act, [33 U.S.C. 1251 et seq.](#)

[Notes of Decisions \(259\)](#)

Current through October 19, 2017; [82 FR 48667](#).

End of Document

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ATTACHMENT 5

Code of Federal Regulations

Title 40. Protection of Environment

Chapter I. Environmental Protection Agency (Refs & Annos)

Subchapter D. Water Programs

Part 122. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
(Refs & Annos)

Subpart B. Permit Application and Special NPDES Program Requirements

40 C.F.R. § 122.34

§ 122.34 Permit requirements for regulated small MS4 permits.

Effective: January 9, 2017

[Currentness](#)

(a) General requirements. For any permit issued to a regulated small MS4, the NPDES permitting authority must include permit terms and conditions to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Terms and conditions that satisfy the requirements of this section must be expressed in clear, specific, and measurable terms. Such terms and conditions may include narrative, numeric, or other types of requirements (e.g., implementation of specific tasks or best management practices (BMPs), BMP design requirements, performance requirements, adaptive management requirements, schedules for implementation and maintenance, and frequency of actions).

(1) For permits providing coverage to any small MS4s for the first time, the NPDES permitting authority may specify a time period of up to 5 years from the date of permit issuance for the permittee to fully comply with the conditions of the permit and to implement necessary BMPs.

(2) For each successive permit, the NPDES permitting authority must include terms and conditions that meet the requirements of this section based on its evaluation of the current permit requirements, record of permittee compliance and program implementation progress, current water quality conditions, and other relevant information.

(b) Minimum control measures. The permit must include requirements that ensure the permittee implements, or continues to implement, the minimum control measures in paragraphs (b)(1) through (6) of this section during the permit term. The permit must also require a written storm water management program document or documents that, at a minimum, describes in detail how the permittee intends to comply with the permit's requirements for each minimum control measure.

(1) Public education and outreach on storm water impacts.

(i) The permit must identify the minimum elements and require implementation of a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: The permittee may use storm water educational materials provided by the State, Tribe, EPA, environmental, public interest or trade organizations, or other MS4s. The public education program should inform individuals and households about the steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes. EPA recommends that the program inform individuals and groups how to become involved in local stream and beach restoration activities as well as activities that are coordinated by youth service and conservation corps or other citizen groups. EPA recommends that the permit require the permittee to tailor the public education program, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed and beach cleanups. In addition, EPA recommends that the permit require that some of the materials or outreach programs be directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, providing information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. The permit should encourage the permittee to tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children.

(2) Public involvement/participation.

(i) The permit must identify the minimum elements and require implementation of a public involvement/participation program that complies with State, Tribal, and local public notice requirements.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: EPA recommends that the permit include provisions addressing the need for the public to be included in developing, implementing, and reviewing the storm water management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts. (Citizens should obtain approval where necessary for lawful access to monitoring sites.)

(3) Illicit discharge detection and elimination.

(i) The permit must identify the minimum elements and require the development, implementation, and enforcement of a program to detect and eliminate illicit discharges (as defined at § 122.26(b)(2)) into the small MS4. At a minimum, the permit must require the permittee to:

(A) Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;

(B) To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions;

(C) Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the system; and

(D) Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

(ii) The permit must also require the permittee to address the following categories of non-storm water discharges or flows (i.e., illicit discharges) only if the permittee identifies them as a significant contributor of pollutants to the small MS4: Water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at [40 CFR 35.2005\(b\)\(20\)](#)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from firefighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States).

(iii) Guidance for NPDES permitting authorities and regulated small MS4s: EPA recommends that the permit require the plan to detect and address illicit discharges include the following four components: Procedures for locating priority areas likely to have illicit discharges; procedures for tracing the source of an illicit discharge; procedures for removing the source of the discharge; and procedures for program evaluation and assessment. EPA recommends that the permit require the permittee to visually screen outfalls during dry weather and conduct field tests of selected pollutants as part of the procedures for locating priority areas. Illicit discharge education actions may include storm drain stenciling, a program to promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials.

(4) Construction site storm water runoff control.

(i) The permit must identify the minimum elements and require the development, implementation, and enforcement of a program to reduce pollutants in any storm water runoff to the small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the Director waives requirements for storm water discharges associated with small construction activity in accordance with [§ 122.26\(b\)\(15\)\(i\)](#), the permittee is not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites. At a minimum, the permit must require the permittee to develop and implement:

(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;

(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;

(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

(D) Procedures for site plan review which incorporate consideration of potential water quality impacts;

(E) Procedures for receipt and consideration of information submitted by the public, and

(F) Procedures for site inspection and enforcement of control measures.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: Examples of sanctions to ensure compliance include non-monetary penalties, fines, bonding requirements and/or permit denials for non-compliance. EPA recommends that the procedures for site plan review include the review of individual pre-construction site plans to ensure consistency with local sediment and erosion control requirements. Procedures for site inspections and enforcement of control measures could include steps to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and receiving water quality. EPA also recommends that the permit require the permittee to provide appropriate educational and training measures for construction site operators, and require storm water pollution prevention plans for construction sites within the MS4's jurisdiction that discharge into the system. See § 122.44(s) (NPDES permitting authorities' option to incorporate qualifying State, Tribal and local erosion and sediment control programs into NPDES permits for storm water discharges from construction sites). Also see § 122.35(b) (The NPDES permitting authority may recognize that another government entity, including the NPDES permitting authority, may be responsible for implementing one or more of the minimum measures on the permittee's behalf).

(5) Post-construction storm water management in new development and redevelopment.

(i) The permit must identify the minimum elements and require the development, implementation, and enforcement of a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the small MS4. The permit must ensure that controls are in place that would prevent or minimize water quality impacts. At a minimum, the permit must require the permittee to:

(A) Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community;

(B) Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; and

(C) Ensure adequate long-term operation and maintenance of BMPs.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. EPA recommends that the permit ensure that BMPs included in the program: Be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. EPA encourages the permittee to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, EPA recommends that the permit require the permittee to adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing the program, the permit should also require the permittee to assess existing ordinances, policies, programs and studies that address storm water runoff quality. In addition to assessing these existing documents and programs, the permit should require the permittee to provide opportunities to the public to participate in the development of the program. Non-structural BMPs are preventative actions that involve management and source controls such as: Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; policies or ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure; education programs for developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas. Structural BMPs include: Storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. EPA recommends that the permit ensure the appropriate implementation of the structural BMPs by considering some or all of the following: Pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Storm water technologies are constantly being improved, and EPA recommends that the permit requirements be responsive to these changes, developments or improvements in control technologies.

(6) Pollution prevention/good housekeeping for municipal operations.

(i) The permit must identify the minimum elements and require the development and implementation of an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, the State, Tribe, or other organizations, the program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: EPA recommends that the permit address the following: Maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from the separate storm sewers; controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas operated by the permittee, and waste transfer stations; procedures for properly disposing of waste removed from the separate storm sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris); and ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices. Operation and maintenance should be an integral component of all storm water management programs. This measure is intended to improve the efficiency of these programs and require new programs where necessary. Properly developed and implemented operation and maintenance programs reduce the risk of water quality problems.

(c) Other applicable requirements. As appropriate, the permit will include:

(1) More stringent terms and conditions, including permit requirements that modify, or are in addition to, the minimum control measures based on an approved total maximum daily load (TMDL) or equivalent analysis, or where the Director determines such terms and conditions are needed to protect water quality.

(2) Other applicable NPDES permit requirements, standards and conditions established in the individual or general permit, developed consistent with the provisions of §§ 122.41 through 122.49.

(d) Evaluation and assessment requirements—

(1) Evaluation. The permit must require the permittee to evaluate compliance with the terms and conditions of the permit, including the effectiveness of the components of its storm water management program, and the status of achieving the measurable requirements in the permit.

Note to paragraph (d)(1): The NPDES permitting authority may determine monitoring requirements for the permittee in accordance with State/Tribal monitoring plans appropriate to the watershed. Participation in a group monitoring program is encouraged.

(2) Recordkeeping. The permit must require that the permittee keep records required by the NPDES permit for at least 3 years and submit such records to the NPDES permitting authority when specifically asked to do so. The permit must require the permittee to make records, including a written description of the storm water management program, available to the public at reasonable times during regular business hours (see § 122.7 for confidentiality

provision). (The permittee may assess a reasonable charge for copying. The permit may allow the permittee to require a member of the public to provide advance notice.)

(3) Reporting. Unless the permittee is relying on another entity to satisfy its NPDES permit obligations under § 122.35(a), the permittee must submit annual reports to the NPDES permitting authority for its first permit term. For subsequent permit terms, the permittee must submit reports in year two and four unless the NPDES permitting authority requires more frequent reports. As of December 21, 2020 all reports submitted in compliance with this section must be submitted electronically by the owner, operator, or the duly authorized representative of the small MS4 to the NPDES permitting authority or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, the owner, operator, or the duly authorized representative of the small MS4 may be required to report electronically if specified by a particular permit or if required to do so by state law. The report must include:

- (i) The status of compliance with permit terms and conditions;
- (ii) Results of information collected and analyzed, including monitoring data, if any, during the reporting period;
- (iii) A summary of the storm water activities the permittee proposes to undertake to comply with the permit during the next reporting cycle;
- (iv) Any changes made during the reporting period to the permittee's storm water management program; and
- (v) Notice that the permittee is relying on another governmental entity to satisfy some of the permit obligations (if applicable), consistent with § 122.35(a).

(e) Qualifying local program. If an existing qualifying local program requires the permittee to implement one or more of the minimum control measures of paragraph (b) of this section, the NPDES permitting authority may include conditions in the NPDES permit that direct the permittee to follow that qualifying program's requirements rather than the requirements of paragraph (b). A qualifying local program is a local, State or Tribal municipal storm water management program that imposes, at a minimum, the relevant requirements of paragraph (b).

Credits

[64 FR 68842, Dec. 8, 1999; 80 FR 64097, Oct. 22, 2015; 81 FR 89349, Dec. 9, 2016]

SOURCE: 45 FR 33418, May 19, 1980, as amended at 48 FR 14153, Apr. 1, 1983, unless otherwise noted.

AUTHORITY: The Clean Water Act, 33 U.S.C. 1251 et seq.

Notes of Decisions (4)

Current through October 19, 2017; 82 FR 48667.

End of Document

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ATTACHMENT 6

Code of Federal Regulations

Title 40. Protection of Environment

Chapter I. Environmental Protection Agency (Refs & Annos)

Subchapter D. Water Programs

Part 122. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
(Refs & Annos)

Subpart C. Permit Conditions

40 C.F.R. § 122.41

§ 122.41 Conditions applicable to all permits (applicable to State programs, see § 123.25).

Effective: December 21, 2015

Currentness

The following conditions apply to all NPDES permits. Additional conditions applicable to NPDES permits are in § 122.42. All conditions applicable to NPDES permits shall be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations (or the corresponding approved State regulations) must be given in the permit.

(a) Duty to comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

(2) The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$25,000 per day for each violation. The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than

\$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.

(3) Any person may be assessed an administrative penalty by the Administrator for violating [section 301](#), [302](#), [306](#), [307](#), [308](#), [318](#) or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under [section 402](#) of this Act. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.

(b) Duty to reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

(c) Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) Duty to mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

(f) Permit actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

(g) Property rights. This permit does not convey any property rights of any sort, or any exclusive privilege.

(h) Duty to provide information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

(i) Inspection and entry. The permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

- (1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- (2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- (3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- (4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

(j) Monitoring and records.

- (1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- (2) Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.
- (3) Records of monitoring information shall include:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) The date(s) analyses were performed;
 - (iv) The individual(s) who performed the analyses;
 - (v) The analytical techniques or methods used; and

(vi) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 unless another method is required under 40 CFR subchapters N or O.

(5) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(k) Signatory requirements.

(1) All applications, reports, or information submitted to the Director shall be signed and certified. (See § 122.22)

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(l) Reporting requirements.—

(1) Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(i) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in § 122.29(b); or

(ii) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under § 122.42(a)(1).

(iii) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;

(2) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(3) Transfers. This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See § 122.61; in some cases, modification or revocation and reissuance is mandatory.)

(4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(i) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices. As of December 21, 2016 all reports and forms submitted in compliance with this section must be submitted electronically by the permittee to the Director or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(ii) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(iii) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

(5) Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(6) Twenty-four hour reporting.

(i) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A report shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times), and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combine sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows,

or bypass events submitted in compliance with this section must be submitted electronically by the permittee to the Director or initial recipient, as defined in [40 CFR 127.2\(b\)](#), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), [§ 122.22](#), and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(ii) The following shall be included as information which must be reported within 24 hours under this paragraph.

(A) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See [§ 122.41\(g\)](#).)

(B) Any upset which exceeds any effluent limitation in the permit.

(C) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See [§ 122.44\(g\)](#).)

(iii) The Director may waive the written report on a case-by-case basis for reports under paragraph (l)(6)(ii) of this section if the oral report has been received within 24 hours.

(7) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (l)(4), (5), and (6) of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (l)(6). For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph (l)(6) and the applicable required data in appendix A to 40 CFR part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the permittee to the Director or initial recipient, as defined in [40 CFR 127.2\(b\)](#), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), [§ 122.22](#), and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(8) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

(9) Identification of the initial recipient for NPDES electronic reporting data. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in appendix A to 40 CFR part 127) to the appropriate initial recipient, as determined by

EPA, and as defined in § 127.2(b) of this chapter. EPA will identify and publish the list of initial recipients on its Web site and in the Federal Register, by state and by NPDES data group [see § 127.2(c) of this chapter]. EPA will update and maintain this listing.

(m) Bypass—

(1) Definitions.

(i) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(ii) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(2) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also it for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (m)(3) and (m)(4) of this section.

(3) Notice—

(i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass. As of December 21, 2020 all notices submitted in compliance with this section must be submitted electronically by the permittee to the Director or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (l) (6) of this section (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this section must be submitted electronically by the permittee to the Director or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(4) Prohibition of bypass.

(i) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(C) The permittee submitted notices as required under paragraph (m)(3) of this section.

(ii) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph (m)(4)(i) of this section.

(n) Upset—

(1) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(2) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (n)(3) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(3) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(i) An upset occurred and that the permittee can identify the cause(s) of the upset;

(ii) The permitted facility was at the time being properly operated; and

(iii) The permittee submitted notice of the upset as required in paragraph (1)(6)(ii)(B) of this section (24 hour notice).

(iv) The permittee complied with any remedial measures required under paragraph (d) of this section.

(4) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(Clean Water Act ([33 U.S.C. 1251 et seq.](#)), Safe Drinking Water Act ([42 U.S.C. 300f et seq.](#)), Clean Air Act ([42 U.S.C. 7401 et seq.](#)), Resource Conservation and Recovery Act ([42 U.S.C. 6901 et seq.](#)))

Editorial Note: In paragraphs (j)(2), (4) and (l)(4)(ii), there are references to 40 CFR part 503. These references are to a proposed rule which was published at [54 FR 5746](#), Feb. 6, 1989. There is currently no part 503 in the Code of Federal Regulations.

Credits

[[48 FR 39620](#), Sept. 1, 1983; [49 FR 38049](#), Sept. 26, 1984; [50 FR 4514](#), Jan. 31, 1985; [50 FR 6941](#), Feb. 19, 1985; [54 FR 255](#), Jan. 4, 1989; [54 FR 18783](#), May 2, 1989; [58 FR 18016](#), April 7, 1993; [65 FR 30908](#), May 15, 2000; [72 FR 11211](#), March 12, 2007; [80 FR 64097](#), Oct. 22, 2015]

SOURCE: [45 FR 33418](#), May 19, 1980, as amended at [48 FR 14153](#), Apr. 1, 1983, unless otherwise noted.

AUTHORITY: The Clean Water Act, [33 U.S.C. 1251 et seq.](#)

Notes of Decisions (528)

Current through October 19, 2017; [82 FR 48667](#).

ATTACHMENT 7

Final Rule

Wednesday
December 8, 1999

Part II

**Environmental
Protection Agency**

40 CFR Parts 9, 122, 123, and 124
National Pollutant Discharge Elimination
System—Regulations for Revision of the
Water Pollution Control Program
Addressing Storm Water Discharges;
Final Rule

Report to Congress on the Phase II
Storm Water Regulations; Notice

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 122, 123, and 124

[FRL—6470—8]

RIN 2040—AC82

National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Today's regulations (Phase II) expand the existing National Pollutant Discharge Elimination System (NPDES) storm water program (Phase I) to address storm water discharges from small municipal separate storm sewer systems (MS4s) (those serving less than 100,000 persons) and construction sites that disturb one to five acres. Although these sources are automatically designated by today's rule, the rule allows for the exclusion of certain sources from the national program based on a demonstration of the lack of impact on water quality, as well as the inclusion of others based on a higher likelihood of localized adverse impact on water quality. Today's regulations also exclude from the NPDES program storm water discharges from industrial facilities that have "no exposure" of industrial activities or materials to storm water. Finally, today's rule extends from August 7, 2001 until March 10, 2003 the deadline by which certain industrial facilities owned by small MS4s must obtain coverage under an NPDES permit. This rule establishes a cost-effective, flexible approach for reducing environmental harm by storm water discharges from many point sources of storm water that are currently unregulated.

EPA believes that the implementation of the six minimum measures identified for small MS4s should significantly reduce pollutants in urban storm water compared to existing levels in a cost-effective manner. Similarly, EPA believes that implementation of Best Management Practices (BMP) controls at small construction sites will also result in a significant reduction in pollutant discharges and an improvement in surface water quality. EPA believes this rule will result in monetized financial, recreational and health benefits, as well as benefits that EPA has been unable to monetize. Expected benefits include reduced scouring and erosion of streambeds, improved aesthetic quality

of waters, reduced eutrophication of aquatic systems, benefit to wildlife and endangered and threatened species, tourism benefits, biodiversity benefits and reduced costs for siting reservoirs. In addition, the costs of industrial storm water controls will decrease due to the exclusion of storm water discharges from facilities where there is "no exposure" of storm water to industrial activities and materials.

DATES: This regulation is effective on February 7, 2000. The incorporation by reference of the rainfall erosivity factor publication listed in the rule is approved by the Director of the Federal Register as of February 7, 2000. For judicial review purposes, this final rule is promulgated as of 1:00 p.m. Eastern Standard Time, on December 22, 1999 as provided in 40 CFR 23.2.

ADDRESSES: The complete administrative record for the final rule and the ICR have been established under docket numbers W-97-12 (rule) and W-97-15 (ICR), and includes supporting documentation as well as printed, paper versions of electronic comments. Copies of information in the record are available upon request. A reasonable fee may be charged for copying. The record is available for inspection and copying from 9 a.m. to 4 p.m., Monday through Friday, excluding legal holidays, at the Water Docket, EPA, East Tower Basement, 401 M Street, SW, Washington, DC. For access to docket materials, please call 202/260-3027 to schedule an appointment.

FOR FURTHER INFORMATION CONTACT: George Utting, Office of Wastewater Management, Environmental Protection Agency, Mail Code 4203, 401 M Street, SW, Washington, DC 20460; (202) 260-5816; sw2@epa.gov.

SUPPLEMENTARY INFORMATION: Entities potentially regulated by this action include:

Category	Examples of regulated entities
Federal, State, Tribal, and Local Governments.	Operators of small separate storm sewer systems, industrial facilities that discharge storm water associated with industrial activity or construction activity disturbing 1 to 5 acres.
Industry	Operators of industrial facilities that discharge storm water associated with industrial activity.
Construction Activity.	Operators of construction activity disturbing 1 to 5 acres.

This table is not intended to be exhaustive, but rather provides a guide

for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility or company is regulated by this action, you should carefully examine the applicability criteria in §§ 122.26(b), 122.31, 122.32, and 123.35 of the final rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

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I. Background

A. Proposed Rule and Pre-Proposal Outreach

On January 9, 1998 (63 FR 1536), EPA proposed to expand the National Pollutant Discharge Elimination System (NPDES) storm water program to include storm water discharges from municipal separate storm sewer systems (MS4s) and construction sites that were smaller than those previously included in the program. The proposal also addressed industrial sources that have "no exposure" of industrial activities and materials to storm water. Today, EPA is promulgating a final rule to implement most of the proposed revisions with minor changes based on public comments received on the proposal. Today's final rule also extends the deadline by which certain industrial facilities operated by municipalities of less than 100,000 population must be covered by a NPDES permit; the

deadline is changed from August 7, 2001 until March 10, 2003.

In 1972, Congress amended the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act (CWA)) to prohibit the discharge of any pollutant to waters of the United States from a point source unless the discharge is authorized by an NPDES permit. The NPDES program is a program designed to track point sources and require the implementation of the controls necessary to minimize the discharge of pollutants. Initial efforts to improve water quality under the NPDES program primarily focused on reducing pollutants in industrial process wastewater and municipal sewage. These discharge sources were easily identified as responsible for poor, often drastically degraded, water quality conditions.

As pollution control measures for industrial process wastewater and municipal sewage were implemented and refined, it became increasingly evident that more diffuse sources of water pollution were also significant causes of water quality impairment. Specifically, storm water runoff draining large surface areas, such as agricultural and urban land, was found to be a major cause of water quality impairment, including the nonattainment of designated beneficial uses.

In 1987, Congress amended the CWA to require implementation, in two phases, of a comprehensive national program for addressing storm water discharges. The first phase of the program, commonly referred to as "Phase I," was promulgated on November 16, 1990 (55 FR 47990). Phase I requires NPDES permits for storm water discharge from a large number of priority sources including municipal separate storm sewer systems ("MS4s") generally serving populations of 100,000 or more and several categories of industrial activity, including construction sites that disturb five or more acres of land.

Today's rule, which is the second phase of the storm water program, expands the existing program to include discharges of storm water from smaller municipalities in urbanized areas and from construction sites that disturb between one and five acres of land. Today's rule allows certain sources to be excluded from the national program based on a demonstrable lack of impact on water quality. The rule also allows other sources not automatically regulated on a national basis to be designated for inclusion based on increased likelihood for localized adverse impact on water quality.

Today's rule also conditionally excludes storm water discharges from industrial facilities that have "no exposure" of industrial activities or materials to storm water. Today's rule and the effort that led to its development are commonly referred to as "Phase II." On August 7, 1995, EPA promulgated a final rule that required facilities to be regulated under Phase II to apply for a NPDES permit by August 7, 2001, unless the NPDES permitting authority designates them as requiring a permit by an earlier date. (60 FR 40230). That rule is referred to as "the Interim Phase II Rule." Today's rule replaces the Interim Phase II rule.

EPA performed extensive outreach and worked with a variety of stakeholders prior to proposing today's rule. On September 9, 1992, EPA published a notice requesting information and public comment on how to prepare regulations under CWA section 402(p)(6) (see 57 FR 41344). The notice identified three sets of issues associated with developing new NPDES storm water regulations: (1) How should EPA identify unregulated sources of storm water to protect water quality, (2) what types of control strategies should EPA develop for these sources, and (3) what are appropriate deadlines for implementing new requirements. The notice recognized that potential sources for coverage under the section 402(p)(6) regulations would fall into two main categories: municipal separate storm sewer systems and individual (commercial and residential) sources. EPA received more than 130 comments on the September 9, 1992, notice. For further discussion of the comments received, see *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System: Report to Congress* (EPA, 1995a), pp. 1–21 to 1–22, and Appendix J (which provides a detailed summary of the comments received as they relate to the specific issues raised in the notice).

In early 1993, the Rensselaerville Institute and EPA held public and expert meetings to assist in developing and analyzing options for identifying unregulated sources and possible controls. The report on the 1993 meetings identified two options that were favored by the various groups that participated. One option was a program that allowed States to select sources to be controlled in a manner consistent with criteria developed by EPA. A second option was a tiered approach under which EPA would select high priority sources for control by NPDES permits and States would select other sources for control under a State water

quality program other than the NPDES program. For additional details see the "Report on the EPA Storm Water Management Program (Rensselaerville Study)," Appendix I of *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System: Report to Congress* (EPA, 1995a).

EPA also conducted outreach with representatives of small entities in conjunction with the convening of a Small Business Advocacy Review Panel under the Small Business Regulatory Enforcement Fairness Act (SBREFA). This process is discussed in section IV.E of today's preamble. For additional background see the discussion in the preamble to the proposal for today's rule.

To assist EPA by providing advice and recommendations regarding the urban municipal wet weather water pollution control program, EPA established the Urban Wet Weather Flows Federal Advisory Committee (hereinafter, "FACA Committee") under the Federal Advisory Committee Act (FACA). The Office of Management and Budget approved the charter for the FACA Committee on March 10, 1995. The FACA Committee provided a forum for identifying and addressing issues associated with water quality impacts from storm water sources.

The FACA Committee established two subcommittees: the Storm Water Phase II FACA Subcommittee and the Sanitary Sewer Overflows (SSOs) FACA Subcommittee. Consistent with the requirements of FACA, the membership of both the FACA Committee and the subcommittees was balanced among EPA's various outside stakeholder interests, including representatives from municipalities, States, Indian Tribes, EPA, industrial and commercial sectors, agriculture, and environmental and public interest groups.

The Storm Water Phase II FACA Subcommittee ("Subcommittee") met fourteen times between September 1995 and June 1998. The 32 Subcommittee members discussed possible regulatory frameworks at these meetings as well as during numerous other meetings and conference calls. Members of the FACA Committee provided views regarding the development of the "no exposure" provision and other provisions in drafts of the Phase II rule. EPA provided Subcommittee members with four successive drafts of the proposed rule and preamble, outlines of the rule, summaries of the written comments received on each draft, and documents identifying the changes made to each draft. In the course of providing input to the Committee, individual

Subcommittee members provided significant input and advice that EPA considered in the context of public comments received. Ultimately, the Subcommittee did not provide a written report back to the FACA Committee, and the FACA Committee did not provide written advice and recommendations to EPA. The Agency, therefore, did not rely on group recommendations in developing today's rule, but does consider the process to have resulted in important public outreach.

B. Water Quality Concerns/ Environmental Impact Studies and Assessments

Storm water runoff from lands modified by human activities can harm surface water resources and, in turn, cause or contribute to an exceedance of water quality standards by changing natural hydrologic patterns, accelerating stream flows, destroying aquatic habitat, and elevating pollutant concentrations and loadings. Such runoff may contain or mobilize high levels of contaminants, such as sediment, suspended solids, nutrients (phosphorous and nitrogen), heavy metals and other toxic pollutants, pathogens, toxins, oxygen-demanding substances (organic material), and floatables (U.S. EPA. 1992).

Environmental Impacts of Storm Water Discharges: A National Profile. EPA 841-R-92-001. Office of Water. Washington, DC). After a rain, storm water runoff carries these pollutants into nearby streams, rivers, lakes, estuaries, wetlands, and oceans. The highest concentrations of these contaminants often are contained in "first flush" discharges, which occur during the first major storm after an extended dry period (Schueler, T.R. 1994. "First Flush of Stormwater Pollutants Investigated in Texas." Note 28. *Watershed Protection Techniques* 1(2)). Individually and combined, these pollutants impair water quality, threatening designated beneficial uses and causing habitat alteration or destruction.

Uncontrolled storm water discharges from areas of urban development and construction activity negatively impact receiving waters by changing the physical, biological, and chemical composition of the water, resulting in an unhealthy environment for aquatic organisms, wildlife, and humans. The following sections discuss the studies and data that address and support this finding.

Although water quality problems also can occur from agricultural storm water discharges and return flows from irrigated agriculture, this area of

concern is statutorily exempted from regulation as a point source under the Clean Water Act and is not discussed here. (See CWA section 502(14)). Other storm water sources not specifically identified in the regulations may be of concern in certain areas and can be addressed on a case-by-case (or category-by-category) basis through the NPDES designation authority preserved by CWA section 402(p)(2)(6), as well as today's rule.

1. Urban Development

Urbanization alters the natural infiltration capability of the land and generates a host of pollutants that are associated with the activities of dense populations, thus causing an increase in storm water runoff volumes and pollutant loadings in storm water discharged to receiving waterbodies (U.S. EPA, 1992). Urban development increases the amount of impervious surface in a watershed as farmland, forests, and meadowlands with natural infiltration characteristics are converted into buildings with rooftops, driveways, sidewalks, roads, and parking lots with virtually no ability to absorb storm water. Storm water and snow-melt runoff wash over these impervious areas, picking up pollutants along the way while gaining speed and volume because of their inability to disperse and filter into the ground. What results are storm water flows that are higher in volume, pollutants, and temperature than the flows in less impervious areas, which have more natural vegetation and soil to filter the runoff (U.S. EPA, 1997. *Urbanization and Streams: Studies of Hydrologic Impacts*. EPA 841-R-97-009. Office of Water. Washington, DC).

Studies reveal that the level of imperviousness in an area strongly correlates with the quality of the nearby receiving waters. For example, a study in the Puget Sound lowland ecoregion found that when the level of basin development exceeded 5 percent of the total impervious area, the biological integrity and physical habitat conditions that are necessary to support natural biological diversity and complexity declined precipitously (May, C.W., E.B. Welch, R.R. Horner, J.R. Karr, and B.W. May. 1997. *Quality Indices for Urbanization Effects in Puget Sound Lowland Streams*, Technical Report No. 154. University of Washington Water Resources Series). Research conducted in numerous geographical areas, concentrating on various variables and employing widely different methods, has revealed a similar conclusion: stream degradation occurs at relatively low levels of imperviousness, such as 10 to 20 percent (even as low as 5 to 10

percent according to the findings of the Washington study referenced above) (Schueler, T.R. 1994. "The Importance of Imperviousness." *Watershed Protection Techniques* 1(3); May, C., R.R. Horner, J.R. Karr, B.W. Mar, and E.B. Welch. 1997. "Effects Of Urbanization On Small Streams In The Puget Sound Lowland Ecoregion." *Watershed Protection Techniques* 2(4); Yoder, C.O., R.J. Miltner, and D. White. 1999. "Assessing the Status of Aquatic Life Designated Uses in Urban and Suburban Watersheds." In *Proceedings: National Conference on Retrofits Opportunities in Urban Environments*. EPA 625-R-99-002, Washington, DC; Yoder, C.O and R.J. Miltner. 1999. "Assessing Biological Quality and Limitations to Biological Potential in Urban and Suburban Watersheds in Ohio." In *Comprehensive Stormwater & Aquatic Ecosystem Management Conference Papers*, Auckland, New Zealand). Furthermore, research has indicated that few, if any, urban streams can support diverse benthic communities at imperviousness levels of 25 percent or more. An area of medium density single family homes can be anywhere from 25 percent to nearly 60 percent impervious, depending on the design of the streets and parking (Schueler, 1994).

In addition to impervious areas, urban development creates new pollution sources as population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, pet waste, litter, pesticides, and household hazardous wastes, which may be washed into receiving waters by storm water or dumped directly into storm drains designed to discharge to receiving waters. More people in less space results in a greater concentration of pollutants that can be mobilized by, or disposed into, storm water discharges from municipal separate storm sewer systems. A modeling system developed for the Chesapeake Bay indicated that contamination of the Bay and its tributaries from runoff is comparable to, if not greater than, contamination from industrial and sewage sources (Cohn-Lee, R. and D. Cameron. 1992. "Urban Stormwater Runoff Contamination of the Chesapeake Bay: Sources and Mitigation." *The Environmental Professional*, Vol. 14).

a. Large-Scale Studies and Assessments

In support of today's regulatory designation of MS4s in urbanized areas, the Agency relied on broad-based assessments of urban storm water runoff and related water quality impacts, as well as more site-specific studies. The

first national assessment of urban runoff characteristics was completed for the *Nationwide Urban Runoff Program (NURP)* study (U.S. EPA. 1983. *Results of the Nationwide Urban Runoff Program, Volume 1—Final Report*. Office of Water. Washington, D.C.). The NURP study is the largest nationwide evaluation of storm water discharges, which includes adverse impacts and sources, undertaken to date.

EPA conducted the NURP study to facilitate understanding of the nature of urban runoff from residential, commercial, and industrial areas. One objective of the study was to characterize the water quality of discharges from separate storm sewer systems that drain residential, commercial, and light industrial (industrial parks) sites. Storm water samples from 81 residential and commercial properties in 22 urban/suburban areas nationwide were collected and analyzed during the 5-year period between 1978 and 1983. The majority of samples collected in the study were analyzed for eight conventional pollutants and three heavy metals.

Data collected under the NURP study indicated that discharges from separate storm sewer systems draining runoff from residential, commercial, and light industrial areas carried more than 10 times the annual loadings of total suspended solids (TSS) than discharges from municipal sewage treatment plants that provide secondary treatment. The NURP study also indicated that runoff from residential and commercial areas carried somewhat higher annual loadings of chemical oxygen demand (COD), total lead, and total copper than effluent from secondary treatment plants. Study findings showed that fecal coliform counts in urban runoff typically range from tens to hundreds of thousands per hundred milliliters of runoff during warm weather conditions, with the median for all sites being around 21,000/100 ml. This is generally consistent with studies that found that fecal coliform mean values range from 1,600 coliform fecal units (CFU)/100 ml to 250,000 cfu/100 ml (Makepeace, D.K., D.W. Smith, and S.J. Stanley. 1995. "Urban Storm Water Quality: Summary of Contaminant Data." *Critical Reviews in Environmental Science and Technology* 25(2):93-139). Makepeace, et al., summarized ranges of contaminants from storm water, including physical contaminants such as total solids (76—36,200 mg/L) and copper (up to 1.41 mg/L); organic chemicals; organic compounds, such as oil and grease (up to 110 mg/L); and microorganisms.

Monitoring data summarized in the NURP study provided important information about urban runoff from residential, commercial, and light industrial areas. The study concluded that the quality of urban runoff can be affected adversely by several sources of pollution that were not directly evaluated in the study, including illicit discharges, construction site runoff, and illegal dumping. Data from the NURP study were analyzed further in the U.S. Geological Survey (USGS) Urban Storm Water Data Base for 22 Metropolitan Areas Throughout the United States study (Driver, N.E., M.H. Mustard, R.B. Rhinesmith, and R.F. Middleburg. 1985. *U.S. Geological Survey Urban Storm Water Data Base for 22 Metropolitan Areas Throughout the United States*. Report No. 85-337 USGS, Lakewood, CO). The USGS report summarized additional monitoring data compiled during the mid-1980s, covering 717 storm events at 99 sites in 22 metropolitan areas and documented problems associated with metals and sediment concentrations in urban storm water runoff. More recent reports have confirmed the pollutant concentration data collected in the NURP study (Marsalek, J. 1990. "Evaluation of Pollutant Loads from Urban Nonpoint Sources." *Wat. Sci. Tech.* 22(10/11):23-30; Makepeace, et al., 1995).

Commenters argued that the NURP study does not support EPA's contention that urban activities significantly jeopardize attainment of water quality standards. One commenter argued that the NURP study and the 1985 USGS study are seriously out of date. Because they were issued 10 years or more before the implementation of the current storm water permit program, the data in those reports do not reflect conditions that exist after implementation of permits issued by authorized States and EPA for storm water from construction sites, large municipalities, and industrial activities.

In response, EPA notes that it is not relying solely on the NURP study to describe current water quality impairment. Rather, EPA is citing NURP as a source of data on typical pollutant concentrations in urban runoff. Recent studies have not found significantly different pollutant concentrations in urban runoff when compared to the original NURP data (see Makepeace, et al., 1995; Marsalek, 1990; and Pitt, et al., 1995).

America's Clean Water—the States' Nonpoint Source Assessment (Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). 1985. *America's Clean Water—The States' Nonpoint Source*

Assessment. Prepared in cooperation with the U.S. EPA, Office of Water, Washington, DC), a comprehensive study of diffuse pollution sources conducted under the sponsorship of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and EPA revealed that 38 States reported urban runoff as a major cause of designated beneficial use impairment and 21 States reported storm water runoff from construction sites as a major cause of beneficial use impairment. In addition, the 1996 305(b) Report (U.S. EPA. 1998. *The National Water Quality Inventory, 1996 Report to Congress*. EPA 841-R-97-008. Office of Water, Washington, DC), provides a national assessment of water quality based on biennial reports submitted by the States as required under CWA section 305(b) of the CWA. In the CWA 305(b) reports, States, Tribes, and Territories assess their individual water quality control programs by examining the attainment or nonattainment of the designated uses assigned to their rivers, lakes, estuaries, wetlands, and ocean shores. A designated use is the legally applicable use specified in a water quality standard for a watershed, waterbody, or segment of a waterbody. The designated use is the desirable use that the water quality should support. Examples of designated uses include drinking water supply, primary contact recreation (swimming), and aquatic life support. Each CWA 305(b) report indicates the assessed fraction of a State's waters that are fully supporting, partially supporting, or not supporting designated beneficial uses.

In their reports, States, Tribes, and Territories first identified and then assigned the sources of water quality impairment for each impaired waterbody using the following categories: industrial, municipal sewage, combined sewer overflows, urban runoff/storm sewers, agricultural, silvicultural, construction, resource extraction, land disposal, hydrologic modification, and habitat modification. The 1996 Inventory, based on a compilation of 60 individual 305(b) reports submitted by States, Tribes, and Territories, assessed the following percentages of total waters nationwide: 19 percent of river and stream miles; 40 percent of lake, pond, and reservoir acres; 72 percent of estuary square miles; and 6 percent of ocean shoreline waters. The 1996 Inventory indicated that approximately 40 percent of the Nation's assessed rivers, lakes, and estuaries are impaired. Waterbodies deemed as "impaired" are either

partially supporting designated uses or not supporting designated uses.

The 1996 Inventory also found urban runoff/discharges from storm sewers to be a major source of water quality impairment nationwide. Urban runoff/storm sewers were found to be a source of pollution in 13 percent of impaired rivers; 21 percent of impaired lakes, ponds, and reservoirs; and 45 percent of impaired estuaries (second only to industrial discharges). In addition, urban runoff was found to be the leading cause of ocean impairment for those ocean miles surveyed.

In addition, a recent USGS study of urban watersheds across the United States has revealed a link between urban development and contamination of local waterbodies. The study found the highest levels of organic contaminants, known as polycyclic aromatic hydrocarbons (PAHs) (products of combustion of wood, grass, and fossil fuels), in the reservoirs of urbanized watersheds (U.S. Geological Survey (USGS). 1998. *Research Reveals Link Between Development and Contamination in Urban Watersheds*. USGS news release. USGS National Water-Quality Assessment Program).

Urban storm water also can contribute significant amounts of toxicants to receiving waters. Pitt, et. al. (1993), found heavy metal concentrations in the majority of samples analyzed. Industrial or commercial areas were likely to be the most significant pollutant source areas (Pitt, R., R. Field, M. Lalor, M. Brown 1993. "Urban stormwater toxic pollutants: assessment, sources, and treatability" *Water Environment Research*, 67(3):260-75).

b. Local and Watershed-Based Studies

In addition to the large-scale nationwide studies and assessments, a number of local and watershed-based studies from across the country have documented the detrimental effects of urban storm water runoff on water quality. A study of urban streams in Milwaukee County, Wisconsin, found local streams to be highly degraded due primarily to urban runoff, while three studies in the Atlanta, Georgia, region were characterized as being "the first documentation in the Southeast of the strong negative relationship between urbanization and stream quality that has been observed in other ecoregions" (Masterson, J. and R. Bannerman. 1994. "Impacts of Storm Water Runoff on Urban Streams in Milwaukee County, Wisconsin." Paper presented at National Symposium on Water Quality: American Water Resources Association; Schueler, T.R. 1997. "Fish Dynamics in Urban Streams Near Atlanta, Georgia."

Technical Note 94. *Watershed Protection Techniques* 2(4)). Several other studies, including those performed in Arizona (Maricopa County), California (San Jose's Coyote Creek), Massachusetts (Green River), Virginia (Tuckahoe Creek), and Washington (Puget Sound lowland ecoregion), all had the same finding: runoff from urban areas greatly impair stream ecology and the health of aquatic life; the more heavily developed the area, the more detrimental the effects (Lopes, T. and K. Fossum. 1995. "Selected Chemical Characteristics and Acute Toxicity of Urban Stormwater, Streamflow, and Bed Material, Maricopa County, Arizona." *Water Resources Investigations Report* 95-4074. USGS; Pitt, R. 1995. "Effects of Urban Runoff on Aquatic Biota." In *Handbook of Ecotoxicology*; Pratt, J. and R. Coler. 1979. "Ecological Effects of Urban Stormwater Runoff on Benthic Macroinvertebrates Inhabiting the Green River, Massachusetts." Completion Report Project No. A-094. Water Resources Research Center. University of Massachusetts at Amherst.; Schueler, T.R. 1997. "Historical Change in a Warmwater Fish Community in an Urbanizing Watershed." Technical Note 93. *Watershed Protection Techniques* 2(4); May, C., R. Horner, J. Karr, B. Mar, and E. Welch. 1997. "Effects Of Urbanization On Small Streams In The Puget Sound Lowland Ecoregion." *Watershed Protection Techniques* 2(4)).

Pitt and others also described the receiving water effects on aquatic organisms associated with urban runoff (Pitt, R.E. 1995. "Biological Effects of Urban Runoff Discharges" In *Stormwater Runoff and Receiving Systems: Impact, Monitoring, and Assessment*, ed. E.E Herricks, Lewis Publishers; Crunkilton, R., J. Kleist, D. Bierman, J. Ramcheck, and W. DeVita. 1999. "Importance of Toxicity as a Factor Controlling the Distribution of Aquatic Organisms in an Urban Stream." In *Comprehensive Stormwater & Aquatic Ecosystem Management Conference Papers*. Auckland, New Zealand).

In Wisconsin, runoff samples were collected from streets, parking lots, roofs, driveways, and lawns. Source areas were broken up into residential, commercial, and industrial. Geometric mean concentration data for residential areas included total solids of about 500-800 mg/L from streets and 600 mg/L from lawns. Fecal coliform data from residential areas ranged from 34,000 to 92,000 cfu/100 mL for streets and driveways. Contaminant concentration data from commercial and industrial source areas were lower for total solids

and fecal coliform, but higher for total zinc (Bannerman, R.T., D.W. Owens, R.B. Dods, and N.J. Hornewer. 1993. "Sources of Pollutants in Wisconsin Stormwater." *Wat. Sci. Tech.* 28(3-5):241-59).

Bannerman, et al. also found that streets contribute higher loads of pollutants to urban storm water than any other residential development source. Two small urban residential watersheds were evaluated to determine that lawns and streets are the largest sources of total and dissolved phosphorus in the basins (Waschbusch, R.J., W.R. Selbig, and R.T. Bannerman. 1999. "Sources of Phosphorus in Stormwater and Street Dirt from Two Urban Residential Basins In Madison, Wisconsin, 1994-95." *Water Resources Investigations Report* 99-4021. U.S. Geological Survey). A number of other studies have indicated that urban roadways often contain significant quantities of metal elements and solids (Sansalone, J.J. and S.G. Buchberger. 1997. "Partitioning and First Flush of Metals in Urban Roadway Storm Water." *ASCE Journal of Environmental Engineering* 123(2); Sansalone, J.J., J.M. Koran, J.A. Smithson, and S.G. Buchberger. 1998. "Physical Characteristics of Urban Roadway Solids Transported During Rain Events" *ASCE Journal of Environmental Engineering* 124(5); Klein, L.A., M. Lang, N. Nash, and S.L. Kirschner. 1974. "Sources of Metals in New York City Wastewater" *J. Water Pollution Control Federation* 46(12):2653-62; Barrett, M.E, R.D. Zuber, E.R. Collins, J.F. Malina, R.J. Charbeneau, and G.H. Ward., 1993. "A Review and Evaluation of Literature Pertaining to the Quantity and Control of Pollution from Highway Runoff and Construction." Research Report 1943-1. Center for Transportation Research, University of Texas, Austin).

c. Beach Closings/Advisories

Urban wet weather flows have been recognized as the primary sources of estuarine pollution in coastal communities. Urban storm water runoff, sanitary sewer overflows, and combined sewer overflows have become the largest causes of beach closings in the United States in the past three years. Storm water discharges from urban areas not only pose a threat to the ecological environment, they also can substantially affect human health. A survey of coastal and Great Lakes communities reports that in 1998, more than 1,500 beach closings and advisories were associated with storm water runoff (Natural Resources Defense Council. 1999. "A Guide to Water Quality at Vacation Beaches" New York, NY). Other reports

also document public health, shellfish bed, and habitat impacts from storm water runoff, including more than 823 beach closings/advisories issued in 1995 and more than 407 beach closing/advisories issued in 1996 due to urban runoff (Natural Resources Defense Council. 1996. *Testing the Waters Volume VI: Who Knows What You're Getting Into*. New York, NY; NRDC. 1997. *Testing the Waters Volume VII: How Does Your Vacation Beach Rate*. New York, NY; Morton, T. 1997. *Draining to the Ocean: The Effects of Stormwater Pollution on Coastal Waters*. American Oceans Campaign, Santa Monica, CA). The Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay (Haile, R.W., et. al. 1996. "An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay." *Final Report prepared for the Santa Monica Bay Restoration Project*) concluded that there is a 57 percent higher rate of illness in swimmers who swim adjacent to storm drains than in swimmers who swim more than 400 yards away from storm drains. This and other studies document a relationship between gastrointestinal illness in swimmers and water quality, the latter of which can be heavily compromised by polluted storm water discharges.

2. Non-Storm Water Discharges Through Municipal Storm Sewers

Studies have shown that discharges from MS4s often include wastes and wastewater from non-storm water sources. Federal regulations (§ 122.26(b)(2)) define an illicit discharge as "* * * any discharge to an MS4 that is not composed entirely of storm water * * *," with some exceptions. These discharges are "illicit" because municipal storm sewer systems are not designed to accept, process, or discharge such wastes. Sources of illicit discharges include, but are not limited to: sanitary wastewater; effluent from septic tanks; car wash, laundry, and other industrial wastewaters; improper disposal of auto and household toxics, such as used motor oil and pesticides; and spills from roadway and other accidents.

Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, and paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants,

including heavy metals, toxics, oil and grease, solvents, nutrients, viruses and bacteria into receiving waterbodies. The NURP study, discussed earlier, found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health. The study noted particular problems with illicit discharges of sanitary wastes, which can be directly linked to high bacterial counts in receiving waters and can be dangerous to public health.

Because illicit discharges to MS4s can create severe widespread contamination and water quality problems, several municipalities and urban counties performed studies to identify and eliminate such discharges. In Michigan, the Ann Arbor and Ypsilanti water quality projects inspected 660 businesses, homes, and other buildings and identified 14 percent of the buildings as having improper storm sewer drain connections. The program assessment revealed that, on average, 60 percent of automobile-related businesses, including service stations, automobile dealerships, car washes, body shops, and light industrial facilities, had illicit connections to storm sewer drains. The program assessment also showed that a majority of the illicit discharges to the storm sewer system resulted from improper plumbing and connections, which had been approved by the municipality when installed (Washtenaw County Statutory Drainage Board, 1987. Huron River Pollution Abatement Program).

In addition, an inspection of urban storm water outfalls draining into Inner Grays, Washington, indicated that 32 percent of these outfalls had dry weather flows. Of these flows, 21 percent were determined to have pollutant levels higher than the pollutant levels expected in typical urban storm water runoff characterized in the NURP study (U.S. EPA, 1993. *Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems—A User's Guide*. EPA 600/R-92/238. Office of Research and Development, Washington, DC). That same document reports a study in Toronto, Canada, that found that 59 percent of outfalls from the MS4 had dry-weather flows. Chemical tests revealed that 14 percent of these dry-weather flows were determined to be grossly polluted.

Inflows from aging sanitary sewer collection systems are one of the most serious illicit discharge-related problems. Sanitary sewer systems frequently develop leaks and cracks, resulting in discharges of pollutants to receiving waters through separate storm

sewers. These pollutants include sanitary waste and materials from sewer main construction (e.g., asbestos cement, brick, cast iron, vitrified clay). Municipalities have long recognized the reverse problem of storm water infiltration into sanitary sewer collection systems; this type of infiltration often disrupts the operation of the municipal sewage treatment plant.

The improper disposal of materials is another illicit discharge-related problem that can result in contaminated discharges from separate storm sewer systems in two ways. First, materials may be disposed of directly in a catch basin or other storm water conveyance. Second, materials disposed of on the ground may either drain directly to a storm sewer or be washed into a storm sewer during a storm event. Improper disposal of materials to street catch basins and other storm sewer inlets often occurs when people mistakenly believe that disposal to such areas is an environmentally sound practice. Part of the confusion may occur because some areas are served by combined sewer systems, which are part of the sanitary sewer collection system, and people assume that materials discharged to a catch basin will reach a municipal sewage treatment plant. Materials that are commonly disposed of improperly include used motor oil; household toxic materials; radiator fluids; and litter, such as disposable cups, cans, and fast-food packages. EPA believes that there has been increasing success in addressing these problems through initiatives such as storm drain stenciling and recycling programs, including household hazardous waste special collection days.

Programs that reduce illicit discharges to separate storm sewers have improved water quality in several municipalities. For example, Michigan's Huron River Pollution Abatement Program found the elimination of illicit connections caused a measurable improvement in the water quality of the Washtenaw County storm sewers and the Huron River (Washtenaw County Statutory Drainage Board, 1987). In addition, an illicit detection and remediation program in Houston, Texas, has significantly improved the water quality of Buffalo Bayou. Houston estimated that illicit flows from 132 sources had a flow rate as high as 500 gal/min. Sources of the illicit discharges included broken and plugged sanitary sewer lines, illicit connections from sanitary lines to storm sewer lines, and floor drain connections (Glanton, T., M.T. Garrett, and B. Goloby. 1992. *The Illicit Connection: Is*

It the Problem? *Wat. Env. Tech.* 4(9):63-8).

3. Construction Site Runoff

Storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical, and physical integrity of the waters may become severely compromised. Water quality impairment results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients (particularly phosphorus), metals, and organic compounds into aquatic systems (Novotny, V. and G. Chesters. 1989. "Delivery of Sediment and Pollutants from Nonpoint Sources: A Water Quality Perspective." *Journal of Soil and Water Conservation*, 44(6):568-76). Estimates indicate that 80 percent of the phosphorus and 73 percent of the Kjeldahl nitrogen in streams is associated with eroded sediment (U.S. Department of Agriculture. 1989. "The Second RCA Appraisal, Soil, Water and Related Resources on Nonfederal Land in the United States, Analysis of Condition and Trends." Cited in Fennessey, L.A.J., and A.R. Jarrett. 1994. "The Dirt in a Hole: A Review of Sedimentation Basins for Urban Areas and Construction Sites." *Journal of Soil and Water Conservation*, 49(4):317-23).

In watersheds experiencing intensive construction activity, the localized impacts of water quality may be severe because of high pollutant loads, primarily sediments. Siltation is the largest cause of impaired water quality in rivers and the third largest cause of impaired water quality in lakes (U.S. EPA, 1998). The 1996 305(b) report also found that construction site discharges were a source of pollution in: 6 percent of impaired rivers; 11 percent of impaired lakes, ponds, and reservoirs; and 11 percent of impaired estuaries. Introduction of coarse sediment (coarse sand or larger) or a large amount of fine sediment is also a concern because of the potential of filling lakes and reservoirs (along with the associated remediation costs for dredging), as well as clogging stream channels (e.g., Paterson, R.G., M.I. Luger, E.J. Burby, E.J. Kaiser, H.R. Malcolm, and A.C. Beard. 1993. "Costs and Benefits of Urban Erosion and Sediment Control: North Carolina Experience." *Environmental Management* 17(2):167-78). Large inputs of coarse sediment into

stream channels initially will reduce stream depth and minimize habitat complexity by filling in pools (U.S. EPA. 1991. *Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska*. EPA 910/9-91-001. Seattle, WA). In addition, studies have shown that stream reaches affected by construction activities often extend well downstream of the construction site. For example, between 4.8 and 5.6 kilometers of stream below construction sites in the Patuxent River watershed were observed to be impacted by sediment inputs (Fox, H.L. 1974. "Effects of Urbanization on the Patuxent River, with Special Emphasis on Sediment Transport, Storage, and Migration." Ph.D. dissertation. Johns Hopkins University, Baltimore, MD. As Cited in Klein, R.D. 1979. "Urbanization and Stream Quality Impairment." *Water Resources Bulletin* 15(4): 948-63).

A primary concern at most construction sites is the erosion and transport process related to fine sediment because rain splash, rills (i.e., a channel small enough to be removed by normal agricultural practices and typically less than 1-foot deep), and sheetwash encourage the detachment and transport of this material to waterbodies (Storm Water Quality Task Force. 1993. *California Storm Water Best Management Practice Handbooks—Construction Activity*. Oakland, CA: Blue Print Service). Construction sites also can generate other pollutants associated with onsite wastes, such as sanitary wastes or concrete truck washout.

Although streams and rivers naturally carry sediment loads, erosion from construction sites and runoff from developed areas can elevate these loads to levels well above those in undisturbed watersheds. It is generally acknowledged that erosion rates from construction sites are much greater than from almost any other land use (Novotny, V. and H. Olem. 1994. *Water Quality: Prevention, Identification, and Management of Diffuse Pollution*. New York: Van Nostrand Reinhold). Results from both field studies and erosion models indicate that erosion rates from construction sites are typically an order of magnitude larger than row crops and several orders of magnitude greater than rates from well-vegetated areas, such as forests or pastures (USDA. 1970. "Controlling Erosion on Construction Sites." *Agriculture Information Bulletin*, Washington, DC; Meyer, L.D., W.H. Wischmeier, and W.H. Daniel. 1971. "Erosion, Runoff and Revegetation of Denuded Construction Sites." *Transactions of the ASAE* 14(1):138-41;

Owen, O.S. 1975. *Natural Resource Conservation*. New York: MacMillan. As cited in Paterson, et al., 1993).

A recent review of the efficiency of sediment basins indicated that inflows from 12 construction sites had a mean TSS concentration of about 4,500 mg/L (Brown, W.E. 1997. "The Limits of Settling." Technical Note No. 83. *Watershed Protection Techniques* 2(3)). In Virginia, suspended sediment concentrations from housing construction sites were measured at 500-3,000 mg/L, or about 40 times larger than the concentrations from already-developed urban areas (Kuo, C.Y. 1976. "Evaluation of Sediment Yields Due to Urban Development." Bulletin No. 98. Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University, Blacksburg, VA).

Similar impacts from storm water runoff have been reported in a number of other studies. For example, Daniel, et al., monitored three residential construction sites in southeastern Wisconsin and determined that annual sediment yields were more than 19 times the yields from agricultural areas (Daniel, T.C., D. McGuire, D. Stoffel, and B. Miller. 1979. "Sediment and Nutrient Yield from Residential Construction Sites" *Journal of Environmental Quality* 8(3):304-08). Daniel, et al., identified total storm runoff, followed by peak storm runoff, as the most influential factors controlling the sediment loadings from residential construction sites. Daniel, et al., also found that suspended sediment concentrations were 15,000-20,000 mg/L in moderate events and up to 60,000 mg/L in larger events.

Wolman and Schick (Wolman, M.G. and A.P. Schick. 1967. "Effects of Construction on Fluvial Sediment, Urban and Suburban Areas of Maryland." *Water Resources Research* 3(2): 451-64) studied the impacts of development on fluvial systems in Maryland and determined that sediment yields in areas undergoing construction were 1.5 to 75 times greater than detected in natural or agricultural catchments. The authors summarize the potential impacts of construction on sediment yields by stating that "the equivalent of many decades of natural or even agricultural erosion may take place during a single year from areas cleared for construction" (Wolman and Schick, 1967).

A number of studies have examined the effects of road construction on erosion rates and sediment yields. A highway construction project in West Virginia disturbed only 4.2 percent of a 4.72-square-mile basin, but resulted in a

three-fold increase in suspended sediment yields (Downs, S.C. and D.H. Appel. 1986. *Progress Report on the Effects of Highway Construction on Suspended-Sediment Discharge in the Coal River and Trace Fork, West Virginia, 1975-81*. USGS Water Resources Investigations Report 84-4275. Charlestown, WV). During the largest storm event, it was estimated that 80 percent of the sediment in the stream originated from the construction site. As is often the case, the increase in suspended sediment load could not be detected further downstream, where the drainage area was more than 50 times larger (269 square miles).

Another study evaluated the effect of 290 acres of highway construction on watersheds ranging in size from 5 to 38 square miles. Suspended sediment loads in the smallest watershed increased by 250 percent, and the estimated sediment yield from the construction area was 37 tons/acre during a 2-year period (Hainly, R.A. 1980. *The Effects of Highway Construction on Sediment Discharge into Blockhouse Creek and Stream Valley Run, Pennsylvania*. USGS Water Resources Investigations Report 80-68. Harrisburg, PA). A more recent study in Hawaii showed that highway construction increased suspended sediment loads by 56 to 76 percent in three small (1 to 4 square mile) basins (Hill, B.R. 1996. *Streamflow and Suspended-Sediment Loads Before and During Highway Construction, North Halawa, Haiku, and Kamooalii Drainage Basins, Oahu, Hawaii, 1983-91*. USGS Water Resources Investigations Report 96-4259. Honolulu, HI). A 1970 study determined that sediment yields from construction areas can be as much as 500 times the levels detected in rural areas (National Association of Counties Research Foundation. 1970. *Urban Soil Erosion and Sediment Control*. Water Pollution Control Research Series, Program #15030 DTL. Federal Water Quality Administration, U.S. Department of Interior. Washington, DC)

Yorke and Herb (Yorke, T.H., and W.J. Herb. 1978. *Effects of Urbanization on Streamflow and Sediment Transport in the Rock Creek and Anacostia River Basins, Montgomery County, Maryland, 1962-74*. USGS Professional Paper 1003, Washington, DC) evaluated nine subbasins in the Maryland portion of the Anacostia watershed for more than a decade in an effort to define the impacts of changing land use/land cover on sediment in runoff. Average annual suspended sediment yields for construction sites ranged from 7 to 100 tons/acre. Storm water discharges from construction sites that occur when the land area is disturbed (and prior to

surface stabilization) can significantly impact designated uses. Examples of designated uses include public water supply, recreation, and propagation of fish and wildlife. The siltation process described previously can threaten all three designated uses by (1) depositing high concentrations of pollutants in public water supplies; (2) decreasing the depth of a waterbody, which can reduce the volume of a reservoir or result in limited use of a water body by boaters, swimmers, and other recreational enthusiasts; and (3) directly impairing the habitat of fish and other aquatic species, which can limit their ability to reproduce.

Excess sediment can cause a number of other problems for waterbodies. It is associated with increased turbidity and reduced light penetration in the water column, as well as more long-term effects associated with habitat destruction and increased difficulty in filtering drinking water. Numerous studies have examined the effect that excess sediment has on aquatic ecosystems. For example, sediment from road construction activity in Northern Virginia reduced aquatic insect and fish communities by up to 85 percent and 40 percent, respectively (Reed, J.R. 1997. "Stream Community Responses to Road Construction Sediments." Bulletin No. 97. Virginia Water Resources Research Center, Virginia Polytechnic Institute, Blacksburg, VA. As cited in Klein, R.D. 1990. *A Survey of Quality of Erosion and Sediment Control and Storm Water Management in the Chesapeake Bay Watershed*. Annapolis, MD: Chesapeake Bay Foundation). Other studies have shown that fine sediment (fine sand or smaller) adversely affects aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within a streambed, and reducing the intergravel dissolved oxygen by reducing the permeability of the bed material (Everest, F.H., J.C. Beschta, K.V. Scrivener, J.R. Koski, J.R. Sedell, and C.J. Cederholm. 1987. "Fine Sediment and Salmonid Production: A Paradox." *Streamside Management: Forestry and Fishery Interactions*, Contract No. 57, Institute of Forest Resources, University of Washington, Seattle, WA). For example, 4.8 and 5.6 kilometers of stream below construction sites in the Patuxent River watershed in Maryland were found to have fine sediment amounts 15 times greater than normal (Fox, 1974. As cited in Klein, 1979). Benthic organisms in the streambed can be smothered by

sediment deposits, causing changes in aquatic flora and fauna, such as fish species composition (Wolman and Schick, 1967). In addition, the primary cause of coral reef degradation in coastal areas is attributed to land disturbances and dredging activities due to urban development (Rogers, C.S. 1990. "Responses of Coral Reefs and Reef Organizations to Sedimentation." *Marine Ecology Progress Series*, 62:185-202).

EPA believes that the water quality impact from small construction sites is as high as or higher than the impact from larger sites on a per acre basis. The concentration of pollutants in the runoff from smaller sites is similar to the concentrations in the runoff from larger sites. The proportion of sediment that makes it from the construction site to surface waters is likely the same for larger and smaller construction sites in urban areas because the runoff from either site is usually delivered directly to the storm drain network where there is no opportunity for the sediment to be filtered out.

The expected contribution of total sediment yields from small sites depends, in part, on the extent to which erosion and sedimentation controls are being applied. Because current storm water regulations are more likely to require erosion and sedimentation controls on larger sites in urban areas, smaller construction sites that lack such programs are likely to contribute a disproportionate amount of the total sediment from construction activities (MacDonald, L.H. 1997. *Technical Justification for Regulating Construction Sites 1-5 Acres in Size*. Unpublished report submitted to U.S. EPA, Washington, DC). Smaller construction sites are less likely to have an effective plan to control erosion and sedimentation, are less likely to properly implement and maintain their plans, and are less likely to be inspected (Brown, W. and D. Caraco. 1997. *Controlling Storm Water Runoff Discharges from Small Construction Sites: A National Review*. Submitted to Office of Wastewater Management, U.S. EPA, Washington, DC., by the Center for Watershed Protection, Silver Spring, MD). The proportion of sediment that makes it from the construction site to surface waters is likely the same for larger and smaller construction sites in urban areas because the runoff from either site is usually delivered directly to the storm drain network, where there is no opportunity for the sediment to be filtered out.

To confirm its belief that sediment yields from small sites are as high as or higher than the 20 to 150 tons/acre/year

measured from larger sites, EPA gave a grant to the Dane County, Wisconsin Land Conservation Department, in cooperation with the USGS, to evaluate sediment runoff from two small construction sites. The first was a 0.34 acre residential lot and the second was a 1.72 acre commercial office development. Runoff from the sites was channeled to a single discharge point for monitoring. Each site was monitored before, during, and after construction.

The Dane County study found that total solids concentrations from these small sites are similar to total solids concentrations from larger construction sites. Results show that for both of the study sites, total solids and suspended solids concentrations were significantly higher during construction than either before or after construction. For example, preconstruction total solids concentrations averaged 642 mg/L during the period when ryegrass was established, active construction total solids concentrations averaged 2,788 mg/L, and post-construction total solids concentrations averaged 132 mg/L (on a pollutant load basis, this equaled 7.4 lbs preconstruction, 35 lbs during construction, and 0.6 lbs post-construction for total solids). While this site was not properly stabilized before construction, after construction was complete and the site was stabilized, post-construction concentrations were more than 20 times less than during construction. The results were even more dramatic for the commercial site. The commercial site had one preconstruction event, which resulted in total solids concentrations of 138 mg/L, while active construction averaged more than 15,000 mg/L and post-construction averaged only 200 mg/L (on a pollutant load basis, this equaled 0.3 lbs preconstruction, 490 lbs during construction, and 13.4 lbs post-construction for total solids). The active construction period resulted in more than 75 times more sediment than either before or after construction (Owens, D.W., P. Jopke, D.W. Hall, J. Balousek and A. Roa. 1999. "Soil Erosion from Small Construction Sites." Draft USGS Fact Sheet. USGS and Dane County Land Conservation Department, WI). The total solids concentrations from these small sites in Wisconsin are similar to total solids concentrations from larger construction sites. For example, a study evaluating the effects of highway construction in West Virginia found that a small storm produced a sediment concentration of 7,520 mg/L (Downs and Appel, 1986).

One important aspect of small construction sites is the number of small sites relative to larger construction sites

and total land area within the watershed. Brown and Caraco surveyed 219 local jurisdictions to assess erosion and sediment control (ESC) programs. Seventy respondents provided data on the number of ESC permits for construction sites smaller than 5 acres. In 27 cases (38 percent of the respondents), more than three-quarters of the permits were for sites smaller than 5 acres; in another 18 cases (26 percent), more than half of the permits were for sites smaller than 5 acres.

In addition, data on the total acreage disturbed by smaller construction sites have been collected recently in two States (MacDonald, 1997). The most recent and complete data set is the listing of the disturbed area for each of the 3,831 construction sites permitted in North Carolina for 1994–1995 and 1995–1996. Nearly 61 percent of the sites that were 1 acre or larger were between 1.0 and 4.9 acres in size. This proportion was consistent between years. Data showed that this range of sites accounted for 18 percent of the total area disturbed by construction. The values showed very little variation between the 2 years of data. The total disturbed area for all sites over this 2-year period was nearly 33,000 acres, or about 0.1 percent of the total area of North Carolina.

EPA estimates that construction sites disturbing greater than 5 acres disturb 2.1-million acres of land (78.1 percent of the total) while sites disturbing between 1 and 5 acres of land disturb 0.5-million acres of land (19.4 percent). The remaining sites on less than 1 acres of land disturb 0.07-million acres of land (only 2.5 percent of the total). Given the high erosion rates associated with most construction sites, small construction sites can be a significant source of water quality impairment, particularly in small watersheds that are undergoing rapid development. Exempting sites under 1 acre will exclude only about 2.5 percent of acreage from program coverage, but will exclude a far higher number of sites, approximately 25 percent.

Several studies have determined that the most effective construction runoff control programs rely on local plan review and field enforcement (Paterson, R. G. 1994. "Construction Practices: the Good, the Bad, and the Ugly." *Watershed Protection Techniques* 1(3)). In his review, Paterson suggests that, given the critical importance of field implementation of erosion and sediment control programs and the apparent shortcomings that exist, much more focus should be given to plan implementation.

Several commenters disputed the data presented in the proposed rule for storm water discharges from smaller construction sites. One commenter stated that EPA has not adequately explained the basis for permitting construction activity down to 1 disturbed acre. Another commenter stated that EPA did not present sufficient data on water quality impacts from construction sites disturbing less than 5 acres.

EPA believes that the data presented above sufficiently support nationwide designation of storm water discharges from construction activity disturbing more than 1 acre. Based on total disturbed land area within a watershed, the cumulative effects of numerous small construction sites can have impacts similar to those of larger sites in a particular area. In addition, waivers for storm water discharges from smaller construction activity will exclude sites not expected to impair water quality. EPA will continue to collect water quality data on construction site storm water runoff.

C. Statutory Background

In 1972, Congress enacted the CWA to prohibit the discharge of any pollutant to waters of the United States from a point source unless the discharge is authorized by an NPDES permit. Congress added CWA section 402(p) in 1987 to require implementation of a comprehensive program for addressing storm water discharges. Section 402(p)(1) required EPA or NPDES-authorized States or Tribes to issue NPDES permits for the following five classes of storm water discharges composed entirely of storm water ("storm water discharges") specifically listed under section 402(p)(2):

(A) a discharge subject to an NPDES permit before February 4, 1987

(B) a discharge associated with industrial activity

(C) a discharge from a municipal separate storm sewer system serving a population of 250,000 or more

(D) a discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000

(E) a discharge that an NPDES permitting authority determines to be contributing to a violation of a water quality standard or a significant contributor of pollutants to the waters of the United States.

Section 402(p)(3)(A) requires storm water discharges associated with industrial activity to meet all applicable provisions of section 402 and section 301 of the CWA, including technology-based requirements and any more

stringent requirements necessary to meet water quality standards. Section 402(p)(3)(B) establishes NPDES permit standards for discharges from municipal separate storm sewer systems, or MS4s. NPDES permits for discharges from MS4s (1) may be issued on a system or jurisdiction-wide basis, (2) must include a requirement to effectively prohibit non-storm water discharges into the storm sewers, and (3) must require controls to reduce pollutant discharges to the maximum extent practicable, including best management practices, and other provisions as the Administrator or the States determine to be appropriate for the control of such pollutants. At this time, EPA determines that water quality-based controls, implemented through the iterative processes described today are appropriate for the control of such pollutants and will result in reasonable further progress towards attainment of water quality standards. See sections II.L and II.H.3 of the preamble.

In CWA section 402(p)(4), Congress established statutory deadlines for the initial steps in implementing the NPDES program for storm water discharges. This section required development of NPDES permit application regulations, submission of NPDES permit applications, issuance of NPDES permits for sources identified in section 402(p)(2), and compliance with NPDES permit conditions. In addition, this section required industrial facilities and large MS4s to submit NPDES permit applications for storm water discharges by February 4, 1990. Medium MS4s were to submit NPDES permit applications by February 4, 1992. EPA and authorized NPDES States were prohibited from requiring an NPDES permit for any other storm water discharges until October 1, 1994.

Section 402(p)(5) required EPA to conduct certain studies and submit a report to Congress. This requirement is discussed in the following section.

Section 402(p)(6) requires EPA, in consultation with States and local officials, to issue regulations for the designation of additional storm water discharges to be regulated to protect water quality. It also requires EPA to extend the existing storm water program to regulate newly designated sources. At a minimum, the extension must establish (1) priorities, (2) requirements for State storm water management programs, and (3) expeditious deadlines. Section 402(p)(6) specifies that the program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as

appropriate. Today's rule implements this section.

D. EPA's Reports to Congress

Under CWA section 402(p)(5), EPA, in consultation with the States, was required to conduct a study. The study was to identify unregulated sources of storm water discharges, determine the nature and extent of pollutants in such discharges, and establish procedures and methods to mitigate the impacts of such discharges on water quality. Section 402(p)(5) also required EPA to report the results of the first two components of that study to Congress by October 1, 1988, and the final report by October 1, 1989.

In March 1995, EPA submitted to Congress a report that reviewed and analyzed the nature of storm water discharges from municipal and industrial facilities that were not already regulated under the initial NPDES regulations for storm water (U.S. Environmental Protection Agency, Office of Water. 1995. *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System Storm Water Program: Report to Congress*. Washington, D.C. EPA 833-K-94-002) ("Report"). The Report also analyzed associated pollutant loadings and water quality impacts from these unregulated sources. Based on identification of unregulated municipal sources and analysis of information on impacts of storm water discharges from municipal sources, the Report recommended that the NPDES program for storm water focus on the 405 "urbanized areas" identified by the Bureau of the Census. The Report further found that a number of discharges from unregulated industrial facilities warranted further investigation to determine the need for regulation. It classified these unregulated industrial discharges in two groups: Group A and Group B. Group A comprised sources that may be considered a high priority for inclusion in the NPDES program for storm water because discharges from these sources are similar or identical to already regulated sources. These "look alike" storm water discharge sources were not covered in the initial NPDES regulations for storm water due to the language used to define "associated with industrial activity." In the initial regulations for storm water, "industrial activity" is identified using Standard Industrial Classification (SIC) codes. The use of SIC codes led to incomplete categorization of industrial activities with discharges that needed to be regulated to protect water quality. Group B consisted of 18 industrial

sectors, which included sources that EPA expected to contribute to storm water contamination due to the activities conducted and pollutants anticipated onsite (e.g., vehicle maintenance, machinery and electrical repair, and intensive agricultural activities).

EPA reported on the latter component of the section 402(p)(5) study via President Clinton's Clean Water Initiative, which was released on February 1, 1994 (U.S. Environmental Protection Agency, Office of Water. 1994. *President Clinton's Clean Water Initiative*. Washington, D.C. EPA 800-R-94-001) ("Initiative"). The Initiative addressed a number of issues associated with NPDES requirements for storm water discharges and proposed (1) establishing a phased compliance with a water quality standards approach for discharges from municipal separate storm sewer systems with priority on controlling discharges from municipal growth and development areas, (2) clarifying that the maximum extent practicable standard should be applied in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects, (3) providing an exemption from the NPDES program for storm water discharges from industrial facilities with no activities or significant materials exposed to storm water, (4) providing extensions to the statutory deadlines to complete implementation of the NPDES program for the storm water program, (5) targeting urbanized areas for the requirements in the NPDES program for storm water, and (6) providing control of discharges from inactive and abandoned mines located on Federal lands in a more targeted, flexible manner. Additionally, prior to promulgation of today's rule, section 431 of the Agency's Appropriation Act for FY 2000 (Departments of Veterans Affairs and Housing and Urban Development and Independent Agencies Appropriations Act of 2000, Public Law 106-74, section 432 (1999)) directed EPA to report on certain matters to be covered in today's rule. That report supplements the study required by CWA Section 402(p)(5). EPA is publishing the availability of that report elsewhere in this issue of the **Federal Register**.

Several commenters asserted that the Report to Congress is an inadequate basis for the designation and regulation of sources covered under today's final rule, specifically the nationwide designation of small municipal separate storm sewer systems within urbanized areas and construction activities disturbing between one and five acres.

EPA believes that it has developed an adequate record for today's regulation both through the Report to Congress and the Clean Water Initiative and through more recent activities, including the FACA Subcommittee process, regulatory notices and evaluation of comments, and recent research and analysis. EPA does not interpret the congressional reporting requirements of CWA section 402(p)(5) to be the sole basis for determining sources to be regulated under today's final rule.

EPA's decision to designate on a national basis small MS4s in urbanized areas is supported by studies that clearly show a direct correlation between urbanization and adverse water quality impacts from storm water discharges. (Schueler, T. 1987. *Controlling Urban Runoff: A Practical Manual for Planning & Designing Urban BMPs*. Metropolitan Washington Council of Governments). "Urbanized areas"—within which all small MS4s would be covered—represent the most intensely developed and dense areas of the Nation. They constitute only two percent of the land area but 63 percent of the total population. See section I.B.1, Urban Development, above, for studies and assessments of the link between urban development and storm water impacts on water resources.

Commenters argued that the Report to Congress does not address storm water discharges from construction sites. They further argued that the designation of small construction sites per today's final rule goes beyond the President's 1994 Initiative because the Initiative only recommends requiring municipalities to implement a storm water management program to control unregulated storm water sources, "including discharges from construction of less than 5 acres, which are part of growth, development and significant redevelopment activities." They point out that the Initiative provides that unregulated storm water discharges not addressed through a municipal program would not be covered by the NPDES program. Commenters assert that EPA has not developed a record independent of its section 402(p)(5) studies that demonstrates the necessity of regulating under a separate NPDES permit storm water discharges from smaller construction sites "to protect water quality." EPA disagrees.

EPA evaluated the nature and extent of pollutants from construction site sources in a process that was separate and distinct from the development of the Report to Congress. Today's decision to regulate certain storm water discharges from construction sites disturbing less than 5 acres arose in part

out of the 9th Circuit remand in *NRDC v. EPA*, 966 F.2d 1292 (9th Cir. 1992). In that case, the court remanded portions of the Phase I storm water regulations related to discharges from construction sites. Those regulations define "storm water discharges associated with industrial activity" to include only those storm water discharges from construction sites disturbing 5 acres or more of total land area (see 40 CFR 122.26(b)(14)(x)). In its decision, the court concluded that the 5-acre threshold was improper because the Agency had failed to identify information "to support its perception that construction activities on less than 5 acres are non-industrial in nature" (966 F.2d at 1306). The court remanded the below 5 acre exemption to EPA for further proceedings (966 F.2d at 1310).

In a **Federal Register** notice issued on December 18, 1992, EPA noted that it did not believe that the Court's decision had the effect of automatically subjecting small construction sites to the existing application requirements and deadlines. EPA believed that additional notice and comment were necessary to clarify the status of these sites. The information received during the notice and comment process and additional research, as discussed in section I.B.3 Construction Site Runoff, formed the basis for the designation of construction activity disturbing between one and five acres on a nationwide basis. EPA's objectives in today's proposal include an effort to (1) address the 9th Circuit remand, (2) address water quality concerns associated with construction activities that disturb less than 5 acres of land, and (3) balance conflicting recommendations and concerns of stakeholders.

One commenter noted that EPA's proposal would fail to regulate industrial facilities identified as Group A and Group B in the March 1995 *Report to Congress*. EPA is relying on the analysis in the Report, which provided that the recommendation for coverage was meant as guidance and was not intended to be an identification of specific categories that must be regulated under Section 402(p)(6). *Report to Congress*, p. 4-1. The Report recognized the existence of limited data on which to base loadings estimates to support the nationwide designation of individual or categories of sources. *Report to Congress*, p. 4-44.

Furthermore, during FACA Subcommittee discussion, EPA continued to urge stakeholders to provide further data relating to industrial and commercial storm water sources, which EPA did not receive. EPA concluded that, due to insufficient

data, these sources were not appropriate for nationwide designation at this time.

E. Industrial Facilities Owned or Operated by Small Municipalities

Congress granted extensions to the NPDES permit application process for selected classes of storm water discharges associated with industrial activity. On December 18, 1991, Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA), which postponed NPDES permit application deadlines for most storm water discharges associated with industrial activity at facilities that are owned or operated by small municipalities. EPA and States authorized to administer the NPDES program could not require any municipality with a population of less than 100,000 to apply for or obtain an NPDES permit for any storm water discharge associated with industrial activity prior to October 1, 1992, except for storm water discharges from airports, power plants, or uncontrolled sanitary landfills. See 40 CFR 122.26(e)(1); 57 FR 11524, April 2, 1992 (reservation of NPDES application deadlines for ISTEA facilities).

The facilities exempted by ISTEA discharge storm water in the same manner (and are expected to use identical processes and materials) as the industrial facilities regulated under the 1990 Phase I regulations. Accordingly, these facilities pose similar water quality problems. The extended moratorium for these facilities was necessary to allow municipalities additional time to comply with NPDES requirements. The proposal for today's rule would have maintained the existing deadline for seeking coverage under an NPDES permit (August 7, 2001).

Today's rule changes the permit application deadline for such municipally owned or operated facilities discharging industrial storm water to make it consistent with the application date for small regulated MS4s. Because EPA missed its March 1999 deadline for promulgating today's rule, and the deadline for MS4s to submit permit applications has been extended to three years and 90 days from the date of this notice, the deadline for permitting ISTEA sources has been similarly extended. The permitting of these sources is discussed below in section "II.I.3. ISTEA Sources."

F. Related Nonpoint Source Programs

Today's rule addresses point source discharges of storm water runoff and non-storm water discharges into MS4s. Many of these sources have been addressed by nonpoint source control

programs, which are described briefly below.

In 1987, section 319 was added to the CWA to provide a framework for funding State and local efforts to address pollutants from nonpoint sources not addressed by the NPDES program. To obtain funding, States are required to submit Nonpoint Source Assessment Reports identifying State waters that, without additional control of nonpoint sources of pollution, could not reasonably be expected to attain or maintain applicable water quality standards or other goals and requirements of the CWA. States are also required to prepare and submit for EPA approval a statewide Nonpoint Source Management Program for controlling nonpoint source water pollution to navigable waters within the State and improving the quality of such waters. State program submittals must identify specific best management practices (BMPs) and measures that the State proposes to implement in the first four years after program submission to reduce pollutant loadings from identified nonpoint sources to levels required to achieve the stated water quality objectives.

State nonpoint source programs funded under section 319 can include both regulatory and nonregulatory State and local approaches. Section 319(b)(2)(B) specifies that a combination of "nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects" may be used, as necessary, to achieve implementation of the BMPs or measures identified in the section 319 submittals.

Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 provides that States with approved coastal zone management programs must develop coastal nonpoint pollution control programs and submit them to EPA and the National Oceanic and Atmospheric Administration (NOAA) for approval. Failure to submit an approvable program will result in a reduction of Federal grants under both the Coastal Zone Management Act and section 319 of the CWA.

State coastal nonpoint pollution control programs under CZARA must include enforceable policies and mechanisms that ensure implementation of the management measures throughout the coastal management area. *EPA issued Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* under section 6217(g) in

January 1993. The guidance identifies management measures for five major categories of nonpoint source pollution. The management measures reflect the greatest degree of pollutant reduction that is economically achievable for each of the listed sources. These management measures provide reference standards for the States to use in developing or refining their coastal nonpoint programs. A few management measures, however, contain quantitative standards that specify pollutant loading reductions. For example, the New Development Management Measure, which is applicable to construction in urban areas, requires (1) that by design or performance the average annual total suspended solid loadings be reduced by 80 percent and (2) to the extent practicable, that the pre-development peak runoff rate and average volume be maintained.

EPA and NOAA published *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* (1993). The document clarifies that States generally must implement management measures for each source category identified in the EPA guidance developed under section 6217(g). Coastal Nonpoint Pollution Control Programs are not required to address sources that are clearly regulated under the NPDES program as point source discharges. Specifically, such programs would not need to address small MS4s and construction sites covered under NPDES storm water permits (both general and individual).

II. Description of Program

A. Overview

1. Objectives EPA Seeks To Achieve in Today's Rule

EPA seeks to achieve several objectives in today's final rule. First,

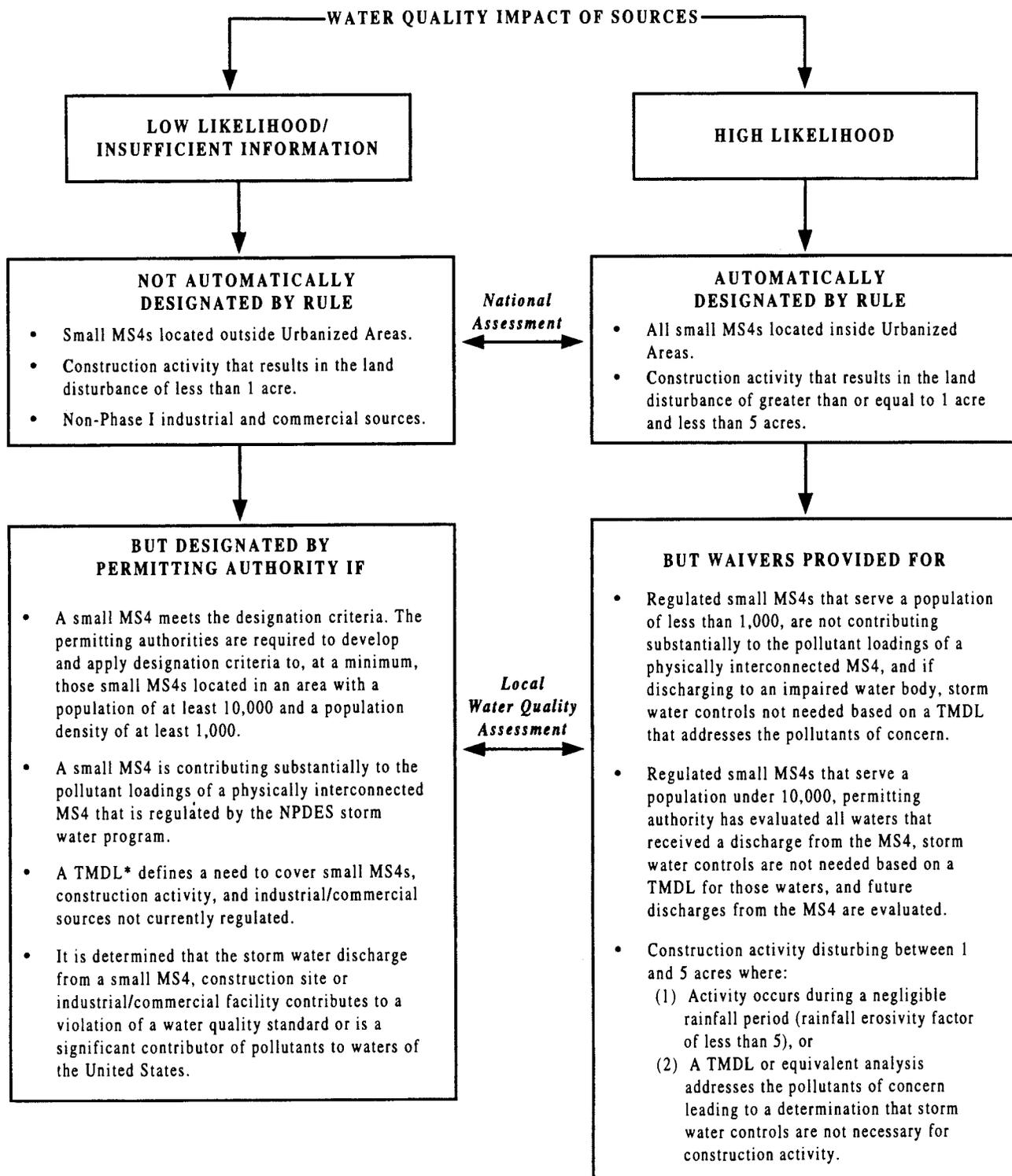
EPA is implementing the requirement under CWA section 402(p)(6) to provide a comprehensive storm water program that designates and controls additional sources of storm water discharges to protect water quality. Second, EPA is addressing storm water discharges from the activities exempted under the 1990 storm water permit application regulations that were remanded by the Ninth Circuit Court of Appeals in *NRDC v. EPA*, 966 F.2d 1292 (9th Circuit, 1992). These are construction activities disturbing less than 5 acres and so-called "light" industrial activities not exposed to storm water (see discussion of "no exposure" below). Third, EPA is providing coverage for the so-called "donut holes" created by the existing NPDES storm water program. Donut holes are geographic gaps in the NPDES storm water program's regulatory scheme. They are MS4s located within areas covered by the existing NPDES storm water program, but not currently addressed by the storm water program because it is based on political jurisdictions. Finally, EPA also is trying to promote watershed planning as a framework for implementing water quality programs where possible.

Although EPA had options for different approaches (see alternatives discussed in the January 9, 1998, proposed regulation), EPA believes it can best achieve its objectives through flexible innovations within the framework of the NPDES program. Unlike the interim section 402(p)(6) storm water regulations EPA promulgated in 1995, EPA no longer designates all of the unregulated storm water discharges for nationwide coverage under the NPDES program for storm water. The framework for today's final rule is one that balances automatic designation on a nationwide basis and

locally-based designation and waivers. Nationwide designation applies to those classes or categories of storm water discharges that EPA believes present a high likelihood of having adverse water quality impacts, regardless of location. Specifically, today's rule designates discharges from small MS4s located in urbanized areas and storm water discharges from construction activities that result in land disturbance equal to or greater than one and less than five acres. As noted under Section I.B., Water Quality Concerns/Environmental Impact Studies and Assessments, these two categories of storm water sources, when unregulated, tend to cause significant adverse water quality impacts. Additional sources are not covered on a nationwide basis either because EPA currently lacks information indicating a consistent potential for adverse water quality impact or because EPA believes that the likelihood of adverse impacts on water quality is low, with some localized exceptions. Additional individual sources or categories of storm water discharges could, however, be covered under the program through a local designation process. A permitting authority may designate additional small MS4s after developing designation criteria and applying those criteria to small MS4s located outside of an urbanized area, in particular those with a population of 10,000 or more and a population density of at least 1,000. Exhibit 1 illustrates the designation framework for today's final rule.

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EXHIBIT 1.—PHASE II SOURCE DECISIONS



*EPA will continue to require States to comply with their Total Maximum Daily Load (TMDL) implementation schedules.

The designation framework for today's final rule provides a significant degree of flexibility. The proposed provisions for nationwide designation of storm water discharges from construction and from small MS4s in urbanized areas allowed for a waiver of applicable requirements based on appropriate water quality conditions. Today's final rule expands and simplifies those waivers.

The permitting authority may waive the requirement for a permit for any small MS4 serving a jurisdiction with a population of less than 1,000 unless storm water controls are needed because the MS4 is contributing to a water quality impairment. The permitting authority may also waive permit coverage for MS4s serving a jurisdiction with a population of less than 10,000 if all waters that receive a discharge from the MS4 have been evaluated and discharges from the MS4 do not significantly contribute to a water quality impairment or have the potential to cause an impairment. Today's rule also allows States with a watershed permitting approach to phase in coverage for MS4s in jurisdictions with populations under 10,000.

Water quality conditions are also the basis for a waiver of requirements for storm water discharges from construction activities disturbing between one and five acres. For these small construction sources, the rule provides significant flexibility for waiving otherwise applicable regulatory requirements where a permitting authority determines, based on water quality and watershed considerations, that storm water discharge controls are not needed.

Coverage can be extended to municipal and construction sources outside the nationwide designated classes or categories based on watershed and case-by-case assessments. For the municipal storm water program, today's rule provides broad discretion to NPDES permitting authorities to develop and implement criteria for designating storm water discharges from small MS4s outside of urbanized areas. Other storm water discharges from unregulated industrial, commercial, and residential sources will not be subject to the NPDES permit requirements unless a permitting authority determines on a case-by-case basis (or on a categorical basis within identified geographic areas such as a State or watershed) that regulatory controls are needed to protect water quality. EPA believes that the flexibility provided in today's rule facilitates watershed planning.

2. General Requirements for Regulated Entities Under Today's Rule

As previously noted, today's final rule defines additional classes and categories of storm water discharges for coverage under the NPDES program. These designated dischargers are required to seek coverage under an NPDES permit. Furthermore, all NPDES-authorized States and Tribes are required to implement these provisions and make any necessary amendments to current State and Tribal NPDES regulations to ensure consistency with today's final rule. EPA remains the NPDES permitting authority for jurisdictions without NPDES authorization.

Today's final rule includes some new requirements for NPDES permitting authorities implementing the CWA section 402(p)(6) program. EPA has made a significant effort to build flexibility into the program while attempting to maintain an appropriate level of national consistency. Permitting authorities must ensure that NPDES permits issued to MS4s include the minimum control measures established under the program. Permitting authorities also have the ability to make numerous decisions including who is regulated under the program, i.e., case-by-case designations and waivers, and how responsibilities should be allocated between regulated entities.

Today's final rule extends the NPDES program to include discharges from the following: small MS4s within urbanized areas (with the exception of systems waived from the requirements by the NPDES permitting authority); other small MS4s meeting designation criteria to be established by the permitting authority; and any remaining MS4 that contributes substantially to the storm water pollutant loadings of a physically interconnected MS4 already subject to regulation under the NPDES program. Small MS4s include urban storm sewer systems owned by Tribes, States, political subdivisions of States, as well as the United States, and other systems located within an urbanized area that fall within the definition of an MS4. These include, for example, State departments of transportation (DOTs), public universities, and federal military bases.

Today's final rule requires all regulated small MS4s to develop and implement a storm water management program. Program components include, at a minimum, 6 minimum measures to address: public education and outreach; public involvement; illicit discharge detection and elimination; construction site runoff control; post-construction storm water management in new

development and redevelopment; and pollution prevention and good housekeeping of municipal operations. These program components will be implemented through NPDES permits. A regulated small MS4 is required to submit to the NPDES permitting authority, either in its notice of intent (NOI) or individual permit application, the BMPs to be implemented and the measurable goals for each of the minimum control measures listed above.

The rule addresses all storm water discharges from construction site activities involving clearing, grading and excavating land equal to or greater than 1 acre and less than 5 acres, unless requirements are otherwise waived by the NPDES permitting authority. Discharges from such sites, as well as construction sites disturbing less than 1 acre of land that are designated by the permitting authority, are required to implement requirements set forth in the NPDES permit, which may reference the requirements of a qualifying local program issued to cover such discharges.

The rule also addresses certain other sources regulated under the existing NPDES program for storm water. For municipally-owned industrial sources required to be regulated under the existing NPDES storm water program but exempted from immediate compliance by the Intermodal Surface Transportation Act of 1991 (ISTEA), the rule revises the existing deadline for seeking coverage under an NPDES permit (August 7, 2001) to make it consistent with the application date for small regulated MS4s. (See section I.3. below.) The rule also provides relief from NPDES storm water permitting requirements for industrial sources with no exposure of industrial materials and activities to storm water.

3. Integration of Today's Rule With the Existing Storm Water Program

In developing an approach for today's final rule, numerous early interested stakeholders encouraged EPA to seek opportunities to integrate, where possible, the proposed Phase II requirements with existing Phase I requirements, thus facilitating a unified storm water discharge control program. EPA believes that this objective is met by using the NPDES framework. This framework is already applied to regulated storm water discharge sources and is extended to those sources designated under today's rule. This approach facilitates program consistency, public access to information, and program oversight.

EPA believes that today's final rule provides consistency in terms of program coverage and requirements for existing and newly designated sources. For example, the rule includes most of the municipal donut holes, those MS4s located in incorporated places, townships or towns with a population under 100,000 that are within Phase I counties. These MS4s are not addressed by the existing NPDES storm water program while MS4s in the surrounding county are currently addressed. In addition, the minimum control measures required in today's rule for regulated small MS4s are very similar to a number of the permit requirements for medium and large MS4s under the existing storm water program. Following today's rule, permit requirements for all regulated MS4s (both those under the existing program and those under today's rule) will require implementation of BMPs. Furthermore, with regard to the development of NPDES permits to protect water quality, EPA intends to apply the August 1, 1996, *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* (hereinafter, "Interim Permitting Approach") (see Section I.L.1. for further description) to all MS4s covered by the NPDES program.

EPA is applying NPDES permit requirements to construction sites below 5 acres that are similar to the existing requirements for those above 5 acres and above. In addition, today's rule allows compliance with qualifying local, Tribal, or State erosion and sediment controls to meet the erosion and sediment control requirements of the general permits for storm water discharges associated with construction, both above and below 5 acres.

4. General Permits

EPA recommends using general permits for all newly regulated storm water sources under today's rule. The use of general permits, instead of individual permits, reduces the administrative burden on permitting authorities, while also limiting the paperwork burden on regulated parties seeking permit authorization. Permitting authorities may, of course, require individual permits in some cases to address specific concerns, including permit non-compliance.

EPA recommends that general permits for MS4s, in particular, be issued on a watershed basis, but recognizes that each permitting authority must decide how to develop its general permit(s). Permit conditions developed to address concerns and conditions of a specific watershed could reflect a watershed

plan; such permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL. If the permitting authority issues a State-wide general permit, the permitting authority may include separate conditions tailored to individual watersheds or urbanized areas. Of course, for a newly regulated MS4, modification of an existing individual MS4 permit to include the newly regulated MS4 as a "limited co-permittee" also remains an option.

5. Tool Box

During the FACA process, many Storm Water Phase II FACA Subcommittee representatives expressed an interest, which was endorsed by the full Committee, in having EPA develop a "tool box" to assist States, Tribes, municipalities, and other parties involved in the Phase II program. EPA made a commitment to work with Storm Water Phase II FACA Subcommittee representatives in developing such a tool box, with the expectation that a tool box would facilitate implementation of the storm water program in an effective and cost-efficient manner. EPA has developed a preliminary working tool box (available on EPA's web page at www.epa.gov/owm/sw/toolbox). EPA intends to have the tool box fully developed by the time of the first general permits. EPA also intends to update the tool box as resources and data become available. The tool box will include the following eight main components: fact sheets; guidances; a menu of BMPs for the six MS4 minimum measures; an information clearinghouse; training and outreach efforts; technical research; support for demonstration projects; and compliance monitoring/assistance tools. EPA intends to issue the menu of BMPs, both structural and non-structural, by October 2000. In addition, EPA will issue by October 2000 a "model" permit and will issue by October 2001 guidance materials on the development of measurable goals for municipal programs.

In an attempt to avoid duplication, the Agency has undertaken an effort to identify and coordinate sources of information that relate to the storm water discharge control program from both inside and outside the Agency. Such information includes research and demonstration projects, grants, storm water management-related programs, and compendiums of available documents, including guidances, related

directly or indirectly to the comprehensive NPDES storm water program. Based on this effort, EPA is developing a tool box containing fact sheets and guidance documents pertaining to the overall program and rule requirements (e.g., guidance on municipal and construction programs, and permitting authority guidance on designation and waiver criteria); models of current programs aimed at assisting States, Tribes, municipalities, and others in establishing programs; a comprehensive list of reference documents organized according to subject area (e.g., illicit discharges, watersheds, water quality standards attainment, funding sources, and similar types of references); educational materials; technical research data; and demonstration project results. The information collected by EPA will not only provide the background for tool box materials, but will also be made available through an information clearinghouse on the world wide web.

With assistance from EPA, the American Public Works Association (APWA) developed a workbook and series of workshops on the proposed Phase II rule. Ten workshops were held from September 1998 through May 1999. Depending on available funding, these workshops may continue after publication of today's final rule. EPA also intends to provide training to enable regional offices to educate States, Tribes, and municipalities about the storm water program and the availability of the tool box materials.

The CWA currently provides funding mechanisms to support activities related to storm water. These mechanisms will be described in the tool box. Activities funded under grant and loan programs, which could be used to assist in storm water program development, include programs in the nonpoint source area, storm water demonstration projects, source water protection and wastewater construction projects. EPA has already provided funding for numerous research efforts in these areas, including a database of BMP effectiveness studies (described below), an assessment of technologies for storm water management, a study of the effectiveness of storm water BMPs for controlling the impacts of watershed imperviousness, protocols for wet weather monitoring, development of a dynamic model for wet weather flows, and numerous outreach projects.

EPA has entered into a cooperative agreement with the Urban Water Resources Research Council of the American Society of Civil Engineers (ASCE) to develop a scientifically-based management tool for the information

needed to evaluate the effectiveness of urban storm water runoff BMPs nationwide. The long-term goal of the National Stormwater BMP Database project is to promote technical design improvements for BMPs and to better match their selection and design to the local storm water problems being addressed. The project team has collected and evaluated hundreds of existing published BMP performance studies and created a database covering about 75 test sites. The database includes detailed information on the design of each BMP and its watershed characteristics, as well as its performance. Eventually the database will include the nationwide collection of information on the characteristics of structural and non-structural BMPs, data collection efforts (e.g., sampling and flow gaging equipment), climatological characteristics, watershed characteristics, hydrologic data, and constituent data. The database will continue to grow as new BMP data become available. The initial release of

the database, which includes data entry and retrieval software, is available on CD-ROM and operates on Windows®-compatible personal computers. The ASCE project team envisions that periodic updates to the database will be distributed through the Internet. The team is currently developing a system for Internet retrieval of selected database records, and this system is expected to be available in early 2000.

EPA and ASCE invite BMP designers, owners and operators to participate in the continuing database development effort. To make this effort successful, a large database is essential. Interested persons are encouraged to submit their BMP performance evaluation data and associated BMP watershed characteristics for potential entry into the database. The software included in the CD-ROM allows data providers to enter their BMP data locally, retain and edit the data as needed, and submit them to the ASCE Database Clearinghouse when ready.

To obtain a copy of the database, please contact Jane Clary, Database Clearinghouse Manager, Wright Water Engineers, Inc., 2490 W. 26th Ave., Suite 100A, Denver, CO 80211; Phone 303-480-1700; E-mail clary@wrightwater.com.

In addition, EPA requests that researchers planning to conduct BMP performance evaluations compile and collect BMP reporting information according to the standard format developed by ASCE. The format is provided with the database software and is also available on the ASCE website at www.asce.org/peta/tech/nsbd01.html.

6. Deadlines Established in Today's Action

Exhibit 2 outlines the various deadlines established under today's final rule. EPA believes that the dates allow sufficient time for completion of both the NPDES permitting authority's and the permittee's program responsibilities.

EXHIBIT 2—STORM WATER PHASE II ACTIONS DEADLINES

Activity	Deadline date
NPDES-authorized States modify NPDES program if no statutory change is required.	1 year from date of publication of today's rule in the Federal Register .
NPDES-authorized States modify NPDES program if statutory change is required.	2 years from date of publication of today's rule in the Federal Register .
EPA issues a menu of BMPs for regulated small MS4s	October 27, 2000
ISTEA sources submit permit application	3 years and 90 days from date of publication of today's rule in the Federal Register .
Permitting authority issues general permit(s) (if this type of permit coverage is selected).	3 years from date of publication of today's rule in the Federal Register .
Regulated small MS4s submit permit application:	
a. If designated under § 122.32(a)(1) unless the permitting authority has established a phasing schedule under § 123.35(d)(3).	a. 3 years and 90 days from date of publication of today's rule in the Federal Register .
b. If designated under § 122.32(a)(2) or §§ 122.26(a)(9)(i) (C) or (D).	b. Within 180 days of notice.
Storm water discharges associated with small construction activity submit permit application:	
a. If designated under § 122.26(b)(15)(i)	a. 3 years and 90 days from date of publication of today's rule in the Federal Register
b. If designated under § 122.26(b)(15)(ii)	b. Within 180 days of notice.
Permitting authority designates small MS4s under § 123.35(b)(2)	3 years from date of publication of today's rule in the Federal Register or 5 years from date of publication of today's rule in the Federal Register if a watershed plan is in place
Regulated small MS4s' program fully developed and implemented	Up to 5 years from date of permit issuance.
Reevaluation of the municipal storm water rules by EPA	13 years from date of publication of today's rule in the Federal Register
Permitting authority determination on a petition	Within 180 days of receipt.
Non-municipal sources designated under § 122.26(a)(9)(i) (C) or (D) submit permit application.	Within 180 days of notice.
Submission of No Exposure Certification	Every 5 years.

B. Readable Regulations

Today, EPA is finalizing new regulations in a "readable regulation" format. This reader-friendly, plain language approach is a departure from traditional regulatory language and should enhance the rule's readability. These plain language regulations use

questions and answers, "you" to identify the person who must comply, and terms like "must" rather than "shall" to identify a mandate. This new format, which minimizes layers of subparagraphs, should also allow the reader to easily locate specific provisions of the regulation.

Some sections of today's final rule are presented in the traditional language and format because these sections amend existing regulations. The readable regulation format was not used in these existing provisions in an attempt to avoid confusion or disruption

of the readability of the existing regulations.

Most commenters supported EPA's use of plain language and agreed with EPA that the question and answer format makes the rule easier to understand. Three commenters thought that EPA should retain the traditional rule format. The June 1, 1998, Presidential memorandum directs all government agencies to write documents in plain language. Based on the majority of the comments, EPA has retained the plain language format used in the January 9, 1998, proposal in today's final rule.

The proposal to today's final rule included guidance as well as legal requirements. The word "must" indicates a requirement. Words like "should," "could," or "encourage" indicate a recommendation or guidance. In addition, the guidance was set off in parentheses to distinguish it from requirements.

EPA received numerous comments supporting the inclusion of guidance in the text of the Code of Federal Regulations (CFR), as well as comments opposing inclusion of guidance. Supporters stated that preambles and guidance documents are often not accessible when rules are implemented. Any language not included in the CFR is therefore not available when it may be most needed. Commenters that opposed including guidance in the CFR expressed the concern that any language in the rule might be interpreted as a requirement, in spite of any clarifying language. They suggested that guidance be presented in the preamble and additional guidance documents.

The majority of commenters on this issue thought that the guidance should be retained but the distinction between requirements and guidance should be better clarified. Suggestions included clarifying text, symbols, and a change from use of the word "should" to "EPA recommends" or "EPA suggests". EPA believes that it is important to include the guidance in the rule and agrees that the distinction between requirements and EPA recommendations must be very clear. In today's final rule, EPA has put the guidance in paragraphs entitled "Guidance" and replaced the word "should" with "EPA recommends." This is intended to clarify that the recommendations contained in the guidance paragraphs are not legally binding.

C. Program Framework: NPDES Approach

Today's rule regulates Phase II sources using the NPDES permit program. EPA interprets Clean Water

Act section 402(p)(6) as authorizing the Agency to develop a storm water program for Phase II sources either as part of the existing NPDES permit program or as a stand alone non-NPDES program such as a self-implementing rule. Under either approach, EPA interprets section 402(p)(6) as directing EPA to publish regulations that "regulate" the remaining unregulated sources, specifically to establish requirements that are federally enforceable under the CWA. Although EPA believes that it has the discretion to not require sources regulated under CWA section 402(p)(6) to be covered by NPDES permits, the Agency has determined, for the reasons discussed below, that it is most appropriate to use NPDES permits in implementing the program to address the sources designated for regulation in today's rule.

As discussed in Section II.A, Overview, EPA sought to achieve certain goals in today's final rule. EPA believes that the NPDES program best achieves EPA's goals for today's final rule for the reasons discussed below.

Requiring Phase II sources to be covered by NPDES permits helps address the consistency problems currently caused by municipal "donut holes." Donut holes are gaps in program coverage where a small unregulated MS4 is located next to or within a regulated larger MS4 that is subject to an NPDES permit under the Phase I NPDES storm water program. The existence of such "donut holes" creates an equity problem because similar discharges may remain unregulated even though they cause or contribute to the same adverse water quality impacts. Using NPDES permits to regulate the unregulated discharges in these areas is intended to facilitate the development of a seamless regulatory program for the mitigation and control of contaminated storm water discharges in an urbanized area. For example, today's rule allows a newly regulated MS4 to join as a "limited" co-permittee with a regulated MS4 by referencing a common storm water management program. Such cooperation should be further encouraged by the fact that the minimum control measures required in today's rule for regulated small MS4s are very similar to a number of the permit requirements for medium and large MS4s under the Phase I storm water program. The minimum control measures applicable to discharges from smaller MS4s are described with slightly more generality than under the Phase I permit application regulations for larger MS4s, thus enabling maximum flexibility for operators of

smaller MS4s to optimize efforts to protect water quality.

Today's rule also applies NPDES permit requirements to construction sites below 5 acres that are similar to the existing requirements for those 5 acres and above. In addition, the rule would allow compliance with qualifying local, Tribal, or State erosion and sediment controls to meet the erosion and sediment control requirements of the general permits for storm water discharges associated with construction, both above and below 5 acres.

Incorporating the CWA section 402(p)(6) program into the NPDES program capitalizes upon the existing governmental infrastructure for administration of the NPDES program. Moreover, much of the regulated community already understands the NPDES program and the way it works.

Another goal of the NPDES program approach is to provide flexibility in order to facilitate and promote watershed planning and sensitivity to local conditions. NPDES permits promote those goals in several ways. NPDES general permits may be used to cover a category of regulated sources on a watershed basis or within political boundaries. The NPDES permitting process provides a mechanism for storm water controls tailored on a case-by-case basis, where necessary. In addition, the NPDES permit requirements of a permittee may be satisfied by another cooperating entity. Finally, NPDES permits may incorporate the requirements of existing State, Tribal and local programs, thereby accommodating State and Tribes seeking to coordinate the storm water program with other programs, including those that focus on watershed-based nonpoint source regulation.

In promoting the watershed approach to program administration, EPA believes NPDES general permits can cover a category of dischargers within a defined geographic area. Areas can be defined very broadly to include political boundaries (e.g., county), watershed boundaries, or State or Tribal land.

NPDES permits generally require an application or a notice of intent (NOI) to trigger coverage. This information exchange assures communication between the permitting authority and the regulated community. This communication is critical in ensuring that the regulated community is aware of the requirements and the permitting authority is aware of the potential for adverse impacts to water quality from identifiable locations. The NPDES permitting process includes the public as a valuable stakeholder and ensures

that the public is included and information is made publicly available.

Another concern for EPA and several stakeholders was that the program ensure citizen participation. The NPDES approach ensures opportunities for citizen participation throughout the permit issuance process, as well as in enforcement actions. NPDES permits are also federally enforceable under the CWA.

EPA believes that the use of NPDES permits makes a significant difference in the degree of compliance with regulations in the storm water program. The NPDES program provides for public participation in the development, enforcement and revision of storm water management programs. Citizen suit enforcement has assisted in focusing attention on adverse water quality impacts on a localized, public priority basis. Citizens frequently rely on the NPDES permitting process and the availability of NOIs to track program implementation and help them enforce regulatory requirements.

NPDES permits are also advantageous to the permittee. The NPDES permit informs the permittee about the scope of what it is expected to do in compliance with the Clean Water Act. As explained more fully in EPA's April 1995 guidance, *Policy Statement on Scope of Discharge Authorization and Shield Associated with NPDES Permits*, compliance with an NPDES permit constitutes compliance with the Clean Water Act (see CWA section 402(k)). In addition, NPDES permittees are excluded from duplicative regulatory regimes under the Resource Conservation and Recovery Act and the Comprehensive Emergency Response, Compensation and Liability Act under RCRA's exclusions to the definition of "solid waste" and CERCLA's exemption for "federally permitted releases."

EPA considered suggestions that the Agency authorize today's rule to be implemented as a self-implementing rule. This would be a regulation promulgated at the Federal, State, or Tribal level to control some or all of the storm water dischargers regulated under today's rule. Under this approach, a rule would spell out the specific requirements for dischargers and impose the restrictions and conditions that would otherwise be contained in an NPDES permit. It would be effective until modified by EPA, a State, or a Tribe, unlike an NPDES permit which cannot exceed a duration of five years. Some stakeholders believed that this approach would reduce the burden on the regulated community (e.g., by not requiring permit applications), and considerably reduce the amount of

additional paperwork, staff time and accounting required to administer the proposed permit requirements.

EPA is sensitive to the interest of some stakeholders in having a streamlined program that minimizes the burden associated with permit administration and maximizes opportunities for field time spent by regulatory authorities. Key provisions in today's rule address some of these concerns by promoting a streamlined approach to permit issuance by, for example, using general permits and allowing the incorporation of existing programs. By adopting the NPDES approach rather than a self-implementing rule, today's rule also allows for consistent regulation between larger MS4s and construction sites regulated under the existing storm water management rule and smaller sources regulated under today's rule.

EPA believes that it is most appropriate to use NPDES permits to implement a program to address the sources regulated by today's rule. In addition to the reasons discussed above, NPDES permits provide a better mechanism than would a self-implementing rule for tailoring storm water controls on a case-by-case basis, where necessary. One commenter reasoned this concern could be addressed by including provisions in the regulation that allow site-specific BMPs (*i.e.*, case-by-case permits), suggesting storm water discharges that might require site-specific BMPs can be identified during the designation process of the regulatory authority. EPA believes that, in addition to its complexity, the commenter's approach lacks the other advantages of the NPDES permitting process.

A self-implementing rule would not ensure the degree of public participation that the NPDES permit process provides for the development, enforcement and revision of the storm water management program. A self-implementing rule also might not have provided the regulated community the "permit shield" under CWA section 402(k) that is provided by an NPDES permit. Based on all these considerations, EPA declined to adopt a self-implementing rule approach and adopted the NPDES approach.

Some State representatives sought alternative approaches for State implementation of the storm water program for Phase II sources. These State representatives asserted that a non-NPDES alternative approach best facilitated watershed management and avoided duplication and overlapping regulations. These representatives believed the NPDES approach would undercut State programs that had

developed storm water controls tailored to local watershed concerns. Finally, a number of commenters expressed the view that States implement a variety of programs not based on the CWA that are effective in controlling storm water, and that EPA should provide incentives for their implementation and improvement in performance.

Throughout the development of the rule, State representatives sought alternatives to the NPDES approach for State implementation of the storm water program for Phase II sources. Discussions focused on an approach whereby States could develop an alternative program that EPA would approve or disapprove based on identified criteria, including that the alternative non-NPDES program would result in "equivalent or better protection of water quality." The State representatives, however, were unable to propose or recommend criteria for gauging whether a program would provide equivalent protection. EPA also did not receive any suggestions for objective, workable criteria in response to the Agency's explicit request for specific criteria (by which EPA could objectively judge such programs) in the preamble to the proposed rule.

EPA evaluated several existing State initiatives to address storm water and found many cases where standards under State programs may be coordinated with the Federal storm water program. Where the NPDES permit is developed in coordination with State standards, there are opportunities to avoid duplication and overlapping requirements. Under today's rule, an NPDES permitting authority may include conditions in the NPDES permit that direct an MS4 to follow the requirements imposed under State standards, rather than the requirements of § 122.34(b). This is allowed as long as the State program at a minimum imposes the relevant requirements of § 122.34(b). Additional opportunities follow from other provisions in today's rule.

Seeking to further explore the feasibility of a non-NPDES approach, the Agency, after the proposal, had extensive discussions with representatives of a number of States. Discussions related specifically to possible alternatives for regulations of urban storm water discharges and MS4s specifically. The Agency also sought input on these issues from other stakeholders.

As a result of these discussions, many of the commenters provided input on issues such as: whether or not the Agency should require NPDES permits; whether location of MS4s in urbanized

areas should be the basis for designation or whether designation should be based on other determinations relating to water quality; whether States should be allowed to satisfy the conditions of the rule through the use of existing State programs; and issues concerning timing and resources for program implementation.

In response, today's rule still follows the regulatory scheme of the proposed rule, but incorporates additional flexibility to address some of the concerns raised by commenters.

In order to facilitate implementation by States that utilize a watershed permitting approach or similar approach (*i.e.*, based on a State's unified watershed assessments), today's rule allows States to phase in coverage for MS4s in jurisdictions with a population less than 10,000. Under such an approach, States could focus their resources on a rolling basis to assist smaller MS4s in developing storm water programs.

In addition, in response to concerns that the rule should not require permit coverage for MS4s that do not significantly contribute to water quality impairments, today's rule provides options for two waivers for small MS4s. The rule allows permitting authorities to exempt from the requirement for a permit any MS4 serving a jurisdiction with a population less than 1,000, unless the State determines that the MS4 must implement storm water controls because it is significantly contributing to a water quality impairment. A second waiver option applies to MS4s serving a jurisdiction with a population less than 10,000. For those MS4s, the State must determine that discharges from the MS4 do not significantly contribute to a water quality impairment, or have the potential for such an impairment, in order to provide the exemption. The State must review this waiver on a periodic basis no less frequently than once every five years.

Throughout the development of today's rule, commenters questioned whether the Clean Water Act authorized the use of the NPDES permit program, pointing out that the text of CWA 402(p)(6) does not use the word "permit." Based on the absence of the word "permit" and the express mention of State storm water management programs, the commenters asserted that Congress did not intend for Phase II sources to be regulated using NPDES permits.

EPA disagrees with the commenters' interpretation of section 402(p)(6). Section 402(p)(6) does not preclude use of permits as part of the

"comprehensive program" to regulate designated sources. The language provides EPA with broad discretion in the establishment of the "comprehensive program." Absence of the word "permit" (a term that the statute does not otherwise define) does not preclude use of a permit, which is a familiar and reasonably well understood regulatory implementation vehicle. First, section 402(p)(6) says that EPA must establish a comprehensive program that "shall, at a minimum, establish priorities, establish requirements for State stormwater management programs, and establish expeditious deadlines." The "at a minimum" language suggests that the Agency may, and perhaps should, develop a comprehensive program that does more than merely attend to these minimum criteria. Use of the term "at a minimum" preserves for the Agency broad discretion to establish a comprehensive program that includes use of NPDES permits.

Further, in the final sentence of the section, Congress included additional language to affirm the Agency's discretion. The final sentence clarifies that the Phase II program "may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate." Under existing CWA programs, performance standards, (effluent limitations) guidelines, management practices, and treatment requirements are typically implemented through NPDES or dredge and fill permits.

Although EPA believes that it had the discretion to not require permits, the Agency has determined that it is reasonable to interpret section 402(p)(6) to authorize permits. Moreover, for the reasons discussed above, the Agency believes that it is appropriate to use NPDES permits in implementing today's rule.

D. Federal Role

Today's final rule describes EPA's approach to expand the existing storm water program under CWA section 402(p)(6). As in all other Federal programs, the Federal government plays an integral role in complying with, developing, implementing, overseeing, and enforcing the program. This section describes EPA's role in the revised storm water program.

1. Develop Overall Framework of the Program

The storm water discharge control program under CWA section 402(p)(6) consists of the rule, tool box, and permits. EPA's primary role is to ensure

timely development and implementation of all components. Today's rule is a refinement of the first step in developing the program. EPA is fully committed to continuing to work with involved stakeholders on developing the tool box and issuing permits. As noted in today's rule, EPA will assess the municipal storm water program based on (1) evaluations of data from the NPDES municipal storm water program, (2) research concerning water quality impacts on receiving waters from storm water, and (3) research on BMP effectiveness. (Section II.H, Municipal Role, provides a more detailed discussion of this provision.)

EPA is planning to standardize minimum requirements for construction and post-construction BMPs in a new rulemaking under Title III of the CWA. While larger construction sites are already subject to NPDES permits (and smaller sites will be subject to permits pursuant to today's rule), the permits generally do not contain specific requirements for BMP design or performance. The permits require the preparation of storm water pollution prevention plans, but actual BMP selection and design is at the discretion of permittees, in conformance with applicable State and local requirements. Where there are existing State and local requirements specific to BMPs, they vary widely, and many jurisdictions do not have such requirements.

In developing these regulations, EPA intends to evaluate the inclusion of design and maintenance criteria as minimum requirements for a variety of BMPs used for erosion and sediment control at construction sites, as well as for permanent BMPs used to manage post-construction storm water discharges. The Agency plans to consider the merits and performance of all appropriate management practices (both structural and non-structural) that can be used to reduce adverse water quality impacts. EPA does not intend to require the use of particular BMPs at specific sites, but plans to assist builders and developers in BMP selection by publishing data on the performance to be expected by various BMP types. EPA would like to build upon the successes of some of the effective State and local storm water programs currently in place around the country, and to establish nation-wide criteria to support builders and local jurisdictions in appropriate BMP selection.

2. Encourage Consideration of Smart Growth Approaches

In the proposal, EPA invited comment on possible approaches for providing

incentives for local decision making that would limit the adverse impacts of growth and development on water quality. EPA asked for comments on this "smart growth" approach.

EPA received comments on all sides of this issue. A number of commenters supported the idea of "smart growth" incentives but did not present concrete ideas. Several commenters suggested "smart growth" criteria. States that have adopted "smart growth" laws were worried that EPA's focus on urbanized areas for municipal requirements could encourage development outside of designated growth areas. Today's final rule clearly allows States to expand coverage of their municipal storm water program outside of urbanized areas. In addition, the flexibility of the six municipal minimum measures should avoid encouragement of development into rural rather than urban areas. For example, as part of the post-construction minimum measure, EPA recommends that municipalities consider policies and ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure, in order to meet the measure's intent.

EPA also received several comments expressing concern that incorporating "smart growth" incentives threatened the autonomy of local governments. One commenter was worried that "incentives" could become more onerous than the minimum measures. EPA is very aware of municipal concerns about possible federal interference with local land use planning. EPA is also cognizant of the difficulty surrounding incentives for "smart growth" activities due to these concerns. However, the Agency believes it has addressed these concerns by proposing a flexible approach and will continue to support the concept of "smart growth" by encouraging policies that limit the adverse impacts of growth and development on water quality.

3. Provide Financial Assistance

Although Congress has not established a fund to fully finance implementation of the proposed extension of the existing NPDES storm water program under CWA section 402(p)(6), numerous federal financing programs (administered by EPA and other federal agencies) can provide some financial assistance. The primary funding mechanism is the Clean Water State Revolving Fund (SRF) program, which provides sources of low-cost financing for a range of water quality infrastructure projects, including storm water. In addition to the SRF, federal financial assistance programs include

the Water Quality Cooperative Agreements under CWA section 104(b)(3), Water Pollution Control Program grants to States under CWA section 106, and the Transportation Equity Act for the 21st Century (TEA-21) among others. In addition, Section 319 funds may be used to fund any urban storm water activities that are not specifically required by a draft or final NPDES permit. EPA will develop a list of potential funding sources as part of the tool box implementation effort. EPA anticipates that some of these programs will provide funds to help develop and, in limited circumstances, implement the CWA section 402(p)(6) storm water discharge control program.

EPA received numerous comments that requested additional funding. Congress provided one substantial new source of potential funding for transportation related storm water projects—TEA-21. The Department of Transportation has included a number of water-related provisions in its TEA-21 planning. These include Transportation Enhancements, Environmental Restoration and Pollution Abatement, and Environmental Streamlining. More information on TEA-21 is available at the following internet sites: www.fhwa.dot.gov/tea21/outreach.htm and www.tea21.org.

4. Implement the Program in Jurisdictions Not Authorized To Administer the NPDES Program

Because today's final rule uses the NPDES framework, EPA will be the NPDES permitting authority in several States, Tribal jurisdictions, and Territories. As such, EPA will have the same responsibilities as any other NPDES permitting authority—issuing permits, designating additional sources, and taking appropriate enforcement actions—and will seek to tailor the storm water discharge control program to the specific needs in that State, Tribal jurisdiction, or Territory. EPA also plans to provide support and oversight, including outreach, training, and technical assistance to the regulated communities. Section II.G. of today's preamble provides a separate discussion related to the NPDES permitting authority's responsibilities for today's final rule.

5. Oversee State and Tribal Programs

Under the NPDES program, EPA plays an oversight role for NPDES-approved States and Tribes. In this role, EPA and the State or Tribe work together to implement, enforce, and improve the NPDES program. Part of this oversight role includes working with States and

Tribes to modify their programs where programmatic or implementation concerns impede program effectiveness. This role will be vitally important when States and Tribes make adjustments to develop, implement, and enforce today's extension of the existing NPDES storm water discharge control program. In addition, States maintain a continuing planning process (CPP) under CWA section 303(e), which EPA periodically reviews to assess the program's achievements.

In its oversight role, EPA takes action to address States and Tribes who have obtained NPDES authorization but are not fulfilling their obligations under the NPDES program. If an NPDES-authorized State or Tribe fails to implement an adequate NPDES storm water program, for example, EPA typically enters into extensive discussions to resolve outstanding issues. EPA has the authority to withdraw the entire NPDES program when resolution cannot be reached. Partial program withdrawal is not provided for under the CWA except for partial approvals.

EPA is also working with the States and Tribes to improve nonpoint source management programs and assessments to incorporate key program elements. Key nonpoint source program elements include setting short and long term goals and objectives; establishing public and private partnerships; using a balanced approach incorporating Statewide and watershed-wide abatement of existing impairments; preventing future impairments; developing processes to address both impaired and threatened waters; reviewing and upgrading all program components, including program revisions on a 5-year cycle; addressing federal land management and activities inconsistent with State programs; and managing State nonpoint source management programs effectively.

In particular, EPA works with the States and Tribes to strengthen their nonpoint source pollution programs to address all significant nonpoint sources, including agricultural sources, through the CWA section 319 program. EPA is working with other government agencies, as well as with community groups, to effect voluntary changes regarding watershed protection and reduced nonpoint source pollution.

In addition, EPA and NOAA have published programmatic and technical guidance to address coastal nonpoint source pollution. Under Section 6217 of the CZARA, States are developing and implementing coastal nonpoint pollution control programs approved by EPA and NOAA.

6. Comply With Applicable Requirements as a Discharger

Today's final rule covers federally operated facilities in a variety of ways. These facilities are generally areas where people reside, such as a federal prison, hospital, or military base. It also includes federal parkways and road systems with separate storm sewer systems. Today's rule requires federal MS4s to comply with the same application deadlines that apply to regulated small MS4s generally. EPA believes that all federal MS4s serve populations of less than 100,000.

EPA received several comments that asked if individual buildings like post offices are considered to be small MS4s and thereby regulated in today's rule if they are in an urbanized area. Most of these buildings have at most a parking lot with runoff or a storm sewer that connects with a municipality's MS4. EPA does not intend that individual federal buildings be considered to be small MS4s. This is discussed in section II.H.2.b. of today's preamble.

Federal facilities can also be included under requirements addressing storm water discharges associated with small construction activities. In any case, discharges from these facilities will need to comply with all applicable NPDES requirements and any additional water quality-related requirements imposed by a State, Tribal, or local government. Failure to comply can result in enforcement actions. Federal facilities can act as models for municipal and private sector facilities and implement or test state-of-the-art management practices and control measures.

E. State Role

Today's final rule sets forth an NPDES approach for implementing the extension of the existing storm water discharge control program under CWA section 402(p)(6). State assumption of the NPDES program is voluntary, consistent with the principles of federalism. Because most States are approved to implement the NPDES program, they will tailor their storm water discharge control programs to address their water quality needs and objectives. While today's rule establishes the basic framework for the section 402(p)(6) program, States as well as Tribes (see discussion in section II.F) have an important role in fine-tuning the program to address the water quality issues within their jurisdictions. The basic framework allows for adjustments based on factors that vary geographically, including climate patterns and terrain.

Where States do not have NPDES authority, they are not required to implement the storm water discharge control program, but they may still participate in water quality protection through participation in the CWA section 401 certification process (for any permits) and through development of water quality standards and TMDLs.

1. Develop the Program

In expanding the existing NPDES program for storm water discharges, States must evaluate whether revisions to their NPDES programs are necessary. If so, modifications must be made in accordance with § 123.62. Under § 123.62, States must revise their NPDES programs within 1 year, or within 2 years if statutory changes are necessary.

Some States and departments of transportation (DOTs) commented that this timeframe is too short, anticipating that the State legislative process and the modification of regulations combined would take beyond 2 years. The deadline language in § 123.62 is not new language for the storm water discharge control program; it applies to all NPDES programs. EPA believes the vast majority of States will meet the deadline and will work with States in those cases where there may be difficulty meeting this deadline due to the timing of legislative sessions and the regulatory development process.

An authorized State NPDES program must meet the requirements of CWA section 402(b) and conform to the guidelines issued under CWA section 304(i)(2). Today's final rule under § 123.25 adds specific cross references to the storm water discharge control program components to ensure that States adequately address these requirements.

2. Comply With Applicable Requirements as a Discharger

Today's final rule covers State operated separate storm sewer systems in a variety of ways. These systems generally drain areas where people reside, such as a prison, hospital, or other populated facility. These systems are included under the definition of a regulated small MS4, which specifically identifies systems operated by State departments of transportation. Alternatively, storm water discharges from State activities may be regulated under the section addressing storm water discharges associated with small construction activities. In any case, discharges from these facilities must comply with all applicable NPDES requirements. Failure to comply can result in enforcement actions. State facilities can act as models for

municipal and private sector facilities and implement or test state-of-the-art management practices and control measures.

3. Communicate With EPA

Under approved NPDES programs, States have an ongoing obligation to share information with EPA. This dialogue is particularly important in the CWA section 402(p)(6) storm water program where these governments continue to develop a great deal of the guidance and outreach related to water quality.

F. Tribal Role

The proposal to today's final rule provides background information on EPA's 1984 Indian Policy and the criteria for treatment of an Indian Tribe in the same manner as a State. Today's final rule extends the existing NPDES program for storm water discharges to two types of dischargers located in Indian country. First, the final rule designates storm water discharges from any regulated small MS4, including Tribal systems. Second, the final rule regulates discharges associated with construction activity disturbing between one and five acres of land, including sites located in Indian country. Operators in each of these categories of regulated activity must apply for coverage under an NPDES permit by 3 years and 90 days from the date of publication of today's final rule. Under existing regulations, however, EPA or an authorized NPDES Tribe may require a specified storm water discharger to apply for NPDES permit coverage before this deadline based on a determination that the discharge is contributing to a violation of a water quality standard (including designated uses) or is a significant contributor of pollutants.

Under today's rule, a Tribal governmental entity may regulate storm water discharges on its reservation in two ways—as either an NPDES-authorized Tribe or as a regulated MS4. If a Tribe is authorized to operate the NPDES program, the Tribe must implement today's final rule for the NPDES program for storm water for covered dischargers located within the EPA recognized boundaries. Otherwise, EPA is generally the permitting/program authority within Indian country. Discussions about the State Role in the preceding section also apply to NPDES authorized Tribes. For additional information on the role and responsibilities of the permitting authority in the NPDES storm water program, see § 123.35 (and Section II.G. of today's preamble) and § 123.25(a).

Under today's final rule, if the Indian reservation is located entirely or partially within an "urbanized area," as defined in § 122.32(a)(1), the Tribe must obtain an NPDES permit if it operates a small MS4 within the urbanized area portion. Tribal MS4s located outside an urbanized area are not automatically covered, but may be designated by EPA pursuant to § 122.32(a)(2) of today's rule or may request designation as a regulated small MS4 from EPA. A Tribe that is a regulated MS4 for NPDES program purposes is required to implement the six minimum control measures to the extent allowable under Federal law.

The Tribal representative on the Storm Water Phase II FACA Subcommittee asked EPA to provide a list of the Tribes located in urbanized areas that would fall within the NPDES storm water program under today's final rule. In December 1996, EPA developed a list of federally recognized American Indian Areas located wholly or partially in Bureau of the Census-designated urbanized areas (see Appendix 1). Appendix 1 not only provides a listing of reservations and individual Tribes, but also the name of the particular urbanized area in which the reservation is located and an indication of whether the urbanized area contains a medium or large MS4 that is already covered by the existing Phase I regulations.

Some of the Tribes listed in Appendix 1 are only partially located in an urbanized area. If the Tribe's MS4 serves less than 1,000 people within an urbanized area, the permitting authority may waive the Tribe's MS4 storm water requirements if it meets the conditions of § 122.32(c). EPA does not have information on the Tribal populations within the urbanized areas, so it can not identify the Tribes that are eligible for a waiver. Therefore, a Tribe that believes it qualifies for a waiver should contact its permitting authority.

G. NPDES Permitting Authority's Role for the NPDES Storm Water Small MS4 Program

As noted previously, the NPDES permitting authority can be EPA or an authorized State or an authorized Tribe. The following discussion describes the role of the NPDES permitting authority under today's final rule.

1. Comply With Implementation Requirements

NPDES permitting authorities must perform certain duties to implement the NPDES storm water municipal program. Section 123.35(a) of today's final rule emphasizes that permitting authorities have existing obligations under the

NPDES program. Section 123.35 focuses on specific issues related to the role of the NPDES authority to support administration and implementation of the municipal storm water program under CWA section 402(p)(6).

2. Designate Sources

Section 123.35(b) of today's final rule addresses the requirements for the NPDES permitting authority to designate sources of storm water discharges to be regulated under §§ 122.32 through 122.36. NPDES permitting authorities must develop a process, as well as criteria, to designate small MS4s. They must also have the authority to designate a small MS4 if and when circumstances that support a waiver under § 122.32(c) change. EPA may make designations if an NPDES-approved State or Tribe fails to do so.

NPDES permitting authorities must examine geographic jurisdictions that they believe should be included in the storm water discharge control program but are not located in an "urbanized area". Small MS4s in these areas are not designated automatically. Discharges from such areas should be brought into the program if found to have actual or potential exceedances of water quality standards, including impairment of designated uses, or other adverse impacts on water quality, as determined by local conditions or watershed and TMDL assessments. EPA's aim is to address discharges to impaired waters and to protect waters with the potential for problems. EPA encourages NPDES permitting authorities, local governments, and the interested public to work together in the context of a watershed plan to address water quality issues, including those associated with municipal storm water runoff.

EPA received comments stating that the process of developing criteria and applying it to all MS4s outside an urbanized area serving a population of 10,000 or greater and with a density of 1,000 people per square mile is too time-consuming and resource-intensive. These commenters believe that the permitting authority should decide which MS4s must be brought into the storm water discharge control program and that population and density should not be an overriding criteria. One suggested way of doing so was to only designate MS4s with demonstrated contributions to the impairment of water quality uses as shown by a TMDL. EPA disagrees with this suggestion. The TMDL process is time-consuming. MS4s outside of urbanized areas may cause water quality problems long before a TMDL is completed.

EPA believes that permitting authorities should consider the potential water quality impacts of storm water from all jurisdictions with a population of 10,000 or greater and a density of 1,000 people per square mile. EPA is using data summarized in the NURP study and in the CWA section 305(b) reports to support this approach for targeted designation outside of urbanized areas. EPA is not mandating which criteria are to be used, but has provided examples of criteria that may be useful in evaluating potential water quality impacts. EPA believes that the flexibility provided in this section of today's final rule allows the permitting authority to develop criteria and a designation process that is easy to use and protects water quality. Therefore, the provisions of § 123.35(b) remain as proposed.

a. Develop Designation Criteria

Under § 123.35(b), the NPDES permitting authority must establish designation criteria to evaluate whether a storm water discharge results in or has the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including adverse habitat and biological impacts.

EPA recommends that NPDES permitting authorities consider, in a balanced manner, certain locally-focused criteria for designating any MS4 located outside of an urbanized area on the basis of significant water quality impacts. EPA recommends consideration of criteria such as discharge to sensitive waters, high growth or growth potential, high population density, contiguity to an urbanized area, significant contribution of pollutants to waters of the United States, and ineffective control of water quality concerns by other programs. These suggested designation criteria are intended to help encourage the permitting authority to use an objective method for identifying and designating, on a local basis, sources that adversely impact water quality. More information about these criteria and the reasons why they are suggested by EPA is included in the January 9, 1998, proposal (63 FR 1561) for today's final rule.

The suggested criteria are meant to be taken in the aggregate, with a great deal of flexibility as to how each should be weighed in order to best account for watershed and other local conditions and to allow for a more tailored case-by-case analysis. The application of criteria is meant to be geographically specific. Furthermore, each criterion does not have to be met in order for a small MS4

to qualify for designation, nor should an MS4 necessarily be designated on the basis of one or two criteria alone.

EPA believes that the application of the recommended designation criteria provides an objective indicator of real and potential water quality impacts from urban runoff on both the local and watershed levels. EPA encourages the application of the recommended criteria in a watershed context, thereby allowing for the evaluation of the water quality impacts of the portions of a watershed outside of an urbanized area. For example, situations exist where the urbanized area represents a small portion of a degraded watershed, and the adjacent nonurbanized areas of the watershed have significant cumulative effects on the quality of the receiving waters.

EPA received numerous suggestions of additional criteria that should be added and reasons why some of the criteria in the proposal to today's final rule were not appropriate. EPA developed its suggested designation criteria based on findings of the NURP study and other studies that indicate pollutants of concern, including total suspended solids, chemical oxygen demand, and temperature. These criteria were the subject of considerable discussion by the Storm Water Phase II FACA Subcommittee. EPA developed them in response to recommendations from the subcommittee during development of the proposed rule. The listed criteria are only suggestions. Permitting authorities are required to develop their own criteria. EPA has not found any reason to change its suggested list of criteria and the suggestions remain as proposed.

b. Apply Designation Criteria

After customizing the designation criteria for local conditions, the permitting authority must apply such criteria, at a minimum, to any MS4 located outside of an urbanized area serving a jurisdiction with a population of at least 10,000 and a population density of 1,000 people per square mile or greater (see § 123.35(b)(2)). If the NPDES permitting authority determines that an MS4 meets the criteria, the permitting authority must designate it as a regulated small MS4. This designation must occur within 3 years of publication of today's final rule. Alternatively, the NPDES authority can designate within 5 years from the date of final regulation if the designation criteria are applied on a watershed basis where a comprehensive watershed plan exists (a comprehensive watershed plan is one that includes the equivalents of TMDLs) (see § 123.35(b)(3)). The extended 5 year

deadline is intended to provide incentives for watershed-based designations. If an NPDES-authorized State or Tribe does not develop and apply designation criteria within this timeframe, then EPA has the opportunity to do so in lieu of the authorized State or Tribe.

NPDES permitting authorities can designate any small MS4, including one below 10,000 in population and 1,000 in density. EPA established the 10,000/1,000 threshold based on the likelihood of adverse water quality impacts at these population and density levels. In addition, the 1,000 persons per square mile threshold is consistent with both the Bureau of the Census definition of an "urbanized area" (see Section II.H.2. below) and stakeholder discussions concerning the definition of a regulated small MS4.

One commenter requested that EPA develop interim deadlines for development of designation criteria. EPA believes that the designation deadline identified in today's final rule at § 123.35(b)(3) provides States and Tribes with a flexibility that allows them to develop and apply the criteria locally in a timely fashion, while at the same time establishing an expeditious deadline.

c. Designate Physically Interconnected Small MS4s

In addition to applying criteria on a local basis for potential designation, the NPDES permitting authority must designate any MS4 that contributes substantially to the pollutant loadings of a physically interconnected municipal separate storm sewer that is regulated by the NPDES program for storm water discharges (see § 123.35(b)(4)). To be "physically interconnected," the MS4 of one entity, including roads with drainage systems and municipal streets, is physically connected directly to the municipal separate storm sewer of another entity. This provision applies to all MS4s located outside of an urbanized area. EPA added this section in recognition of the concerns of local government stakeholders that a local government should not have to shoulder total responsibility for a storm water program when storm water discharges from another MS4 are also contributing pollutants or adversely affecting water quality. This provision also helps to provide some consistency among MS4 programs and to facilitate watershed planning in the implementation of the NPDES storm water program. EPA recommended physical interconnectedness in the existing NPDES storm water regulations as a

factor for consideration in the designation of additional sources.

Today's final rule does not include interim deadlines for identifying physically interconnected MS4s. However, consistent with the deadlines identified in § 123.35(b)(3) of today's final rule, EPA encourages the permitting authority to make these determinations within 3 years from the date of publication of the final rule or within 5 years if the permitting authority is implementing a comprehensive watershed plan. Alternatively, the affected jurisdiction could use the petition process under 40 CFR 122.26(f) in seeking to have the permitting authority designate the contributing jurisdiction.

Several commenters expressed concerns about who could be designated under this provision (§ 123.35(b)(4)). One commenter requested that the word "substantially" be deleted from the rule because they believe any MS4 that contributes at all to a physically interconnected municipal separate storm sewer should be regulated. EPA believes that the word "substantially" provides necessary flexibility to the permitting authorities. The permitting authority can decide if an MS4 is contributing discharges to another municipal separate storm sewer in a manner that requires regulation. If the operator of a regulated municipal separate storm sewer believes that some of its pollutant loadings are coming from an unregulated MS4, it can petition the permitting authority to designate the unregulated MS4 for regulation.

d. Respond to Public Petitions for Designation

Today's final rule reiterates the existing opportunity for the public to petition the permitting authority for designation of a point source to be regulated to protect water quality. The petition opportunity also appears in existing NPDES regulations at 40 CFR 122.26(f). Any person may petition the permitting authority to require an NPDES permit for a discharge composed entirely of storm water that contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States (see § 123.32(b)). The NPDES permitting authority must make a final determination on any petition within 180 days after receiving the petition (see § 123.35(c)). EPA believes that a 180 day limit balances the public's need for a timely final determination with the NPDES permitting authority's need to prioritize its workload. If an NPDES-approved State or Tribe fails to act

within the 180-day timeframe, EPA may make a determination on the petition. EPA believes that public involvement is an important component of the NPDES program for storm water and feels that this provision encourages public participation. Section II.K, Public Involvement/Public Role, further discusses this topic.

3. Provide Waivers

Today's rule provides two opportunities for the NPDES permitting authority to exempt certain small MS4s from the need for a permit based on water quality considerations. See §§ 122.32(d) and (e). The two waiver opportunities have different size thresholds and take different approaches to considering the water quality impacts of discharges from the MS4.

In the proposal, EPA requested comment on the option of waiving coverage for all MS4s with less than 1,000 people unless the permitting authority determined that the small MS4 should be regulated based on significant adverse water quality impacts. A number of commenters supported this option. They expressed concern that compliance with the rule requirements and certification of one of the waiver provisions were both costly for very small communities. They stated that the permitting authority should identify a water quality problem before requiring compliance. Today's rule essentially adopts this alternative approach for MS4s serving a population under 1,000.

The final rule has expanded the waiver provision that EPA proposed for small MS4s with a population less than 1,000. The proposed rule would have required a small MS4 operator to certify that storm water controls are not needed based on either wasteload allocations that are part of TMDLs that address the pollutants of concern, or a comprehensive watershed plan implemented for the waterbody that includes the equivalents of TMDLs and addresses the pollutant(s) of concern. Commenters noted that the proposed waivers would be unattainable if a TMDL or equivalent analysis was required for every pollutant that could possibly be present in any amount in discharges from an MS4 regardless of whether the pollutant is causing water quality impairment. Commenters asked that EPA identify what constitutes the "pollutant(s) of concern" for which a TMDL or its equivalent must be developed. For example, § 122.30(c) indicates that the MS4 program is intended to control "sediment, suspended solids, nutrients, heavy

metals, pathogens, toxins, oxygen-demanding substances, and floatables." Commenters asked whether TMDLs or equivalent analyses have to address all of these.

EPA has revised the proposed waiver in response to these concerns. Under today's rule, NPDES permitting authorities may waive the requirements of today's rule for any small MS4 with a population less than 1,000 that does not contribute substantially to the pollutant loadings of a physically interconnected MS4, unless the small MS4 discharges pollutants that have been identified as a cause of impairment of the waters to which the small MS4 discharges. If the small MS4 does discharge pollutants that have been identified as impairing the water body into which the small MS4 discharges, the NPDES permitting authority may grant a waiver only if it determines that storm water controls are not needed based on an EPA approved or established TMDL that addresses the pollutant(s) of concern.

Unlike the proposed rule, § 122.32(d) does not allow the waiver for MS4s serving a population under 1,000 to be based on "the equivalent of a TMDL." Because § 122.32(d) requires a pollutant specific analysis only for a pollutant that has been identified as a cause of impairment, a TMDL is required for such pollutant before the waiver may be granted. Once a pollutant has been identified as the cause of impairment of a water body, the State should develop a TMDL for that pollutant for that water body. Thus, § 122.32(d) takes a different approach than that taken for the waiver in § 122.32(e) for MS4s serving a population under 10,000, which can be based upon an analysis that is "the equivalent of a TMDL." This is because § 122.32(d) requires an analysis to support the waiver for MS4s under 1,000 only if a waterbody to which the MS4 discharges has been identified as impaired. The § 122.32(e) waiver, on the other hand, would be available for larger MS4s but only after the State affirmatively establishes lack of impairment based upon a comprehensive analysis of smaller urban waters that might not otherwise be evaluated for the purposes of CWA section 303. Since § 122.32(e) requires the analysis of waters that have not been identified as impaired, an actual TMDL is not required and an analysis that is the equivalent of a TMDL can suffice to support the waiver.

Where a State is the NPDES permitting authority, the permitting authority is responsible for the development of the TMDLs as well as the assessment of the extent to which a

small MS4's discharge contributes pollutants to a neighboring regulated system. In States where EPA is the permitting authority, EPA will use a State's TMDLs to determine whether storm water controls are required for the small MS4s.

The proposed rule would have required the operator of the small MS4 serving a population under 1,000 to certify that its discharge was covered under a TMDL that indicated that discharges from its particular system were not having an adverse impact on water quality (*i.e.*, it was either not assigned wasteload allocations under TMDLs or its discharge is within an assigned allocation). Many commenters expressed concerns that MS4 operators serving less than 1,000 persons may lack the technical capacity to certify that their discharges are not contributing to adverse water quality impacts. These commenters thought that the permitting authority should make such a certification. Today's rule provides flexibility as to how the waiver is administered. Permitting authorities are ultimately responsible for granting the waiver, but are free to determine whether or not to require small MS4 operators that are seeking waivers to submit information or a written certification.

Under § 122.32(e) a State may grant a waiver to an MS4 serving a population between 1,000 and 10,000 only if the State has made a comprehensive effort to ensure that the MS4 will not cause or contribute to water quality impairment. To grant a § 122.32(e) waiver, the NPDES permitting authority must evaluate all waters of the U.S. that receive a discharge from the MS4 and determine that storm water controls are not needed. The permitting authority's evaluation must be based on wasteload allocations that are part of an EPA approved or established TMDL or, if a TMDL has not been developed or approved, an equivalent analysis that determines sources and allocations for the pollutant(s) of concern. The pollutants of concern that the permitting authority must evaluate include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the MS4. Finally, the permitting authority must have determined that future discharges from the MS4 do not have the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant

water quality impacts, including habitat and biological impacts.

Although EPA did not propose this specific approach, the Agency did request comment on whether to increase the proposed 1,000 population threshold for a waiver. The § 122.32(e) waiver was developed in response to comments, including States' concerns that they needed greater flexibility to focus their efforts on MS4s that were causing water quality impairment. Several commenters thought that the threshold should be increased from 1,000 to 5,000 or 10,000. Others suggested additional ways of qualifying for a waiver for MS4s that discharge to waters that are not covered by a TMDL or watershed plan. EPA carefully considered all the options for expanding the waiver provisions and has decided to expand the waiver only in the very narrow circumstances described above where a comprehensive analysis has been undertaken to demonstrate that the MS4 is not causing water quality impairment.

The NPDES permitting authority can, at any time, mandate compliance with program requirements from a previously waived small MS4 if circumstances change. For example, a waiver can be withdrawn in circumstances where the permitting authority later determines that a waived small MS4's storm water discharge to a small stream will cause adverse impacts to water quality or significantly interfere with attainment of water quality standards. A "change in circumstances" could involve receipt of new information. Changed circumstances can also allow a regulated small MS4 operator to request a waiver at any time.

Some commenters expressed concerns about allowing any small MS4 waivers. One commenter stated that storm water pollution prevention plans are necessary to control storm water pollution and should be required from all regulated small MS4s. For the reasons stated in the Background section above, EPA agrees that the discharges from most MS4s in urbanized areas should be addressed by a storm water management program outlined in today's rule. For MS4s serving very small areas, however, the TMDL development process provides an opportunity to determine whether an MS4 serving a population less than 1,000 is having a negative impact on any receiving water that is impaired by a pollutant that the MS4 discharges. MS4s serving populations up to 10,000 may receive a waiver only if a comprehensive analysis of its impact on receiving water has been performed.

Other commenters said that waivers should not be allowed for small MS4s that discharge into another regulated MS4. These commenters stated that the word "substantially" should be removed from § 122.32(d)(i) so that a waiver would not be allowed for any system "contributing to the storm water pollutant loadings of a physically interconnected regulated MS4." As previously mentioned under the designation discussion of section II.G.2.c, EPA believes that the word "substantially" provides needed flexibility to the permitting authorities. It is important to note that this is only one aspect that the permitting authority must consider when deciding on the appropriateness of a waiver.

4. Issue Permits

NPDES permitting authorities have a number of responsibilities regarding the permit process. Sections 123.35(d) through (g) ensure a certain level of consistency for permits, yet provide numerous opportunities for flexibility. NPDES permitting authorities must issue NPDES permits to cover municipal sources to be regulated under § 122.32, unless waived under § 122.32(c). EPA encourages permitting authorities to use general permits as the vehicle for permitting and regulating small MS4s. The Agency notes, however, that some operators may wish to take advantage of the option to join as a co-permittee with an MS4 regulated under the existing NPDES storm water program.

Today's final rule includes a provision, § 123.35(f), that requires NPDES permitting authorities to either include the requirements in § 122.34 for NPDES permits issued for regulated small MS4s or to develop permit limits based on a permit application submitted by a small MS4. See Section II.H.3.a, Minimum Control Measures, for more details on the actual § 122.34 requirements. See Section II.H.3.c for alternative and joint permitting options.

In an attempt to avoid duplication of effort, § 122.34(c) allows NPDES permitting authorities to include permit conditions that direct an MS4 to meet the requirements of a qualifying local, Tribal, or State municipal storm water management program. For a local, Tribal, or State program to "qualify," it must impose, at a minimum, the relevant requirements of § 122.34(b). A regulated small MS4 must still follow the procedural requirements for an NPDES permit (*i.e.*, submit an application, either an individual application or an NOI under a general permit) but will instead follow the substantive pollutant control

requirements of the qualifying local, Tribal, or State program.

Under § 122.35(b), NPDES permitting authorities may also recognize existing responsibilities among governmental entities for the minimum control measures in an NPDES small MS4 storm water permit. For example, the permit might acknowledge the existence of a State administered program that addresses construction site runoff and require that the municipalities only develop substantive controls for the remaining minimum control measures. By acknowledging existing programs, this provision is meant to reduce the duplication of efforts and to increase the flexibility of the NPDES storm water program.

Section 123.35(e) of today's final rule requires permitting authorities to specify a time period of up to 5 years from the issuance date of an NPDES permit for regulated small MS4 operators to fully develop and implement their storm water programs. As discussed more fully below, permitting authorities should be providing extensive support to the local governments to assist them in developing and implementing their programs.

In the proposed rule, EPA stated that the permitting authority would develop the menu of BMPs and if they failed to do so, EPA would develop the menu. Commenters felt that EPA should develop a menu of BMPs, rather than just providing guidance. In the settlement agreement for seeking an extension to the deadline for issuing today's rule, EPA committed to developing a menu of BMPs by October 27, 2000. Permitting authorities can adopt EPA's menu or develop their own. The menu itself is not intended to replace more comprehensive BMP guidance materials. As part of the tool box efforts, EPA will provide separate guidance documents that discuss the results from EPA-sponsored nationwide studies on the design, operation and maintenance of BMPs. Additionally, EPA expects that the new rulemaking on construction BMPs may provide more specific design, operation and maintenance criteria.

5. Support and Oversee the Local Programs

NPDES permitting authorities are responsible for supporting and overseeing the local municipal programs. Section 123.35(h) of today's final rule highlights issues associated with these responsibilities.

To the extent possible, NPDES permitting authorities should provide financial assistance to MS4s, which

often have limited resources, for the development and implementation of local programs. EPA recognizes that funding for programs at the State and Tribal levels may also be limited, but strongly encourages States and Tribes to provide whatever assistance is possible. In lieu of actual dollars, NPDES permitting authorities can provide cost-cutting assistance in a number of ways. For example, NPDES permitting authorities can develop outreach materials for MS4s to distribute or the NPDES permitting authority can actually distribute the materials. Another option is to implement an erosion and sediment control program across an entire State (or Tribal land), thus alleviating the need for the MS4 to implement its own program. The NPDES permitting authority must balance the need for site-specific controls, which are best handled by a local MS4, with its ability to offer financial assistance. EPA, States, Tribes, and MS4s should work as a team in making these kinds of decisions.

NPDES permitting authorities are responsible for overseeing the local programs. Permitting authorities should work with the regulated community and other stakeholders to assist in local program development and implementation. This might include sharing information, analyzing reports, and taking enforcement actions, as necessary. NPDES permitting authorities play a vital role in supporting local programs by providing technical and programmatic assistance, conducting research projects, and monitoring watersheds. The NPDES permitting authority can also assist the MS4 permittee in obtaining adequate legal authority at the local level in order to implement the local component of the CWA section 402(p)(6) program.

NPDES permitting authorities are encouraged to coordinate and utilize the data collected under several programs. States and Tribes address point and nonpoint source storm water discharges through a variety of programs. In developing programs to carry out CWA section 402(p)(6), EPA recommends that States and Tribes coordinate all of their water pollution evaluation and control programs, including the continuing planning process under CWA section 303(e), the existing NPDES program, the CZARA program, and nonpoint source pollution control programs.

In addition, NPDES permitting authorities are encouraged to provide a brief (e.g., two-page) reporting format to facilitate compilation and analysis of data from reports submitted under § 122.34(g)(3). EPA intends to develop a model form for this purpose.

H. Municipal Role

1. Scope of Today's Rule

Today's final rule attempts to establish an equitable and comprehensive four-pronged approach for the designation of municipal sources. First, the approach defines for automatic coverage the municipal systems believed to be of highest threat to water quality. Second, the approach designates municipal systems that meet a set of objective criteria used to measure the potential for water quality impacts. Third, the approach designates on a case-by-case basis municipal systems that "contribute substantially to the pollutant loadings of a physically-interconnected [regulated] MS4." Finally, the approach designates on a case-by-case basis, upon petition, municipal systems that "contribute to a violation of a water quality standard or are a significant contributor of pollutants."

Today's final rule automatically designates for regulation small MS4s located in urbanized areas, and requires that NPDES permitting authorities examine for potential designation, at a minimum, a particular subset of small MS4s located outside of urbanized areas. Today's rule also includes provisions that allow for waivers from the otherwise applicable requirements for the smallest MS4s that are not causing impairment of a receiving water body. Qualifications for the waivers vary depending on whether the MS4 serves a population under 1,000 or a population under 10,000. See §§ 122.32(d) and (e). These waivers are discussed further in section II.G.3. Any small MS4 automatically designated by the final rule or designated by the permitting authority under today's final rule is defined as a "regulated" small MS4 unless it receives a waiver.

In today's final rule, all regulated small MS4s must establish a storm water discharge control program that meets the requirements of six minimum control measures. These minimum control measures are public education and outreach on storm water impacts, public involvement participation, illicit discharge detection and elimination, construction site storm water runoff control, post-construction storm water management in new development and redevelopment, and pollution prevention/good housekeeping for municipal operations.

Today's rule allows for a great deal of flexibility in how an operator of a regulated small MS4 is authorized to discharge under an NPDES permit, by providing various options for obtaining permit coverage and satisfying the

required minimum control measures. For example, the NPDES permitting authority can incorporate by reference qualifying State, Tribal, or local programs in an NPDES general permit and can recognize existing responsibilities among different governmental entities for the implementation of minimum control measures. In addition, a regulated small MS4 can participate in the storm water management program of an adjoining regulated MS4 and can arrange to have another governmental entity implement a minimum control measure on their behalf.

2. Municipal Definitions

a. Municipal Separate Storm Sewer Systems (MS4s)

The CWA does not define the term "municipal separate storm sewer." EPA defined municipal separate storm sewer in the existing storm water permit application regulations to mean, in part, a conveyance or system of conveyances (including roads with drainage systems and municipal streets) that is "owned or operated by a State, city, town borough, county, parish, district, association, or other public body * * * designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a Publicly Owned Treatment Works as defined at 40 CFR 122.2" (see § 122.26(b)(8)(i)). Section 122.26 contains definitions of medium and large municipal separate storm sewer systems but no definition of a municipal separate storm sewer system, even though the term MS4 is commonly used. In today's rule, EPA is adding a definition of municipal separate storm sewer system and small municipal separate storm sewer system along with the abbreviations MS4 and small MS4.

The existing municipal permit application regulations define "medium" and "large" MS4s as those located in an incorporated place or county with a population of at least 100,000 (medium) or 250,000 (large) as determined by the latest Decennial Census (see §§ 122.26(b)(4) and 122.26(b)(7)). In today's final rule, these regulations have been revised to define all medium and large MS4s as those meeting the above population thresholds according to the 1990 Decennial Census.

Today's rule also corrects the titles and contents of Appendices F, G, H, & I to Part 122. EPA is adding those incorporated places and counties whose 1990 population caused them to be defined as a "medium" or "large" MS4. All of these MS4s have applied for

permit coverage so the effect of this change to the appendices is simply to make them more accurate. They will not need to be revised again because today's rule "freezes" the definition of "medium" and "large" MS4s at those that qualify based on the 1990 census.

EPA received several comments supporting and opposing the proposal to "freeze" the definitions based on the 1990 census. Commenters who disagreed with EPA's position cited the unfairness of municipalities that reach the medium or large threshold at a later date having fewer permitting requirements compared to those that were already at the population thresholds when the existing storm water regulations took effect. EPA recognizes this disparity but does not believe it is unfair, as explained in the proposed rule. The decision was based on the fact that the deadlines from the existing regulations have lapsed, and because the permitting authority can always require more from operators of MS4s serving "newly over 100,000" populations.

b. Small Municipal Separate Storm Sewer Systems

The proposal to today's final rule added "the United States" as a potential owner or operator of a municipal separate storm sewer. This addition was intended to address an omission from existing regulations and to clarify that federal facilities are, in fact, covered by the NPDES program for municipal storm water discharges when the federal facility is like other regulated MS4s. EPA received a comment that this change would cause federal facilities located in Phase 1 areas to be considered Phase 1 dischargers due to the definition of medium and large MS4s. All MS4s located in Phase 1 cities or counties are defined as Phase 1 medium or large MS4s. EPA believes that all federal facilities serve a population of under 100,000 and should be regulated as small MS4s. Therefore, in § 122.26(a)(16) of today's final rule, EPA is adding federal facilities to the NPDES storm water discharge control program by changing the proposed definition of small municipal separate storm sewer system. Paragraph (i) of this section restates the definition of municipal separate storm sewer with the addition of "the United States" as a owner or operator of a small municipal separate storm sewer. Paragraph (ii) repeats the proposed language that states that a small MS4 is a municipal separate storm sewer that is not medium or large.

Most commenters agreed that federal facilities should be covered in the same

way as other similar MS4s. However, EPA received several comments asking whether individual federal buildings such as post offices or urban offices of the U.S. Park Service must apply for coverage as regulated small MS4s. Most of these buildings have, at most, a parking lot with runoff or a storm sewer that connects with a municipality's MS4. In § 122.26(a)(16)(iii), EPA clarifies that the definition of small MS4 does not include individual buildings. These buildings may have a municipal separate storm sewer but they do not have a "system" of conveyances. The minimum measures for small MS4s were written to apply to storm sewer "systems" providing storm water drainage service to human populations and not to individual buildings. This is true of municipal separate storm sewers from State buildings as well as from federal buildings.

There will likely be situations where the permitting authority must decide if a federal or State complex should be regulated as a small MS4. A federal complex of two or three buildings could be treated as a single building and not be required to apply for coverage. In these situations, permitting authorities will have to use their best judgment as to the nature of the complex and its storm water conveyance system. Permitting authorities should also consider whether the federal or State complex cooperates with its municipality's efforts to implement their storm water management program.

Along with the questions about individual buildings, EPA received many questions about how various provisions of the rule should be interpreted for federal and State facilities. EPA acknowledges that federal and State facilities are different from municipalities. EPA believes, however, that the minimum measures are flexible enough that they can be implemented by these facilities. As an example, DOD commenters asked about how to interpret the term "public" for military installations when implementing the public education measure. EPA agrees with the suggested interpretation of "public" for DOD facilities as "the resident and employee population within the fence line of the facility."

EPA also received many comments from State departments of transportation (DOTs) that suggested the ways in which they are different from municipalities and should therefore be regulated differently. Storm water discharges from State DOTs in Phase 1 areas should already be regulated under Phase I. The preamble to Phase 1 clearly states that "all systems within a

geographical area including highways and flood control districts will be covered." Many permitting authorities regulated State DOTs as co-permittees with the Phase 1 municipality in which the highway is located. State DOTs that are already regulated under Phase I are not required to comply with Phase II. State DOTs that are not already regulated have various options for meeting the requirements of today's rule. These options are discussed in Section II.H.3.c.iv below. Several DOTs commented that some of the minimum measures are outside the scope of their mission or that they do not have the legal authority required for implementation. EPA believes that the flexibility of the minimum measures allows them to be implemented by most MS4s, including DOTs. When a DOT does not have the necessary legal authority, EPA encourages the DOT to coordinate their storm water management efforts with the surrounding municipalities and other State agencies. Under today's rule, DOTs can use any of the options of § 122.35 to share their storm water management responsibilities. DOTs may also want to work with their permitting authority to develop a State-wide DOT storm water permit.

There are many storm water discharges from State DOTs and other State MS4s located in Phase 1 areas that were not regulated under Phase 1. Today's rule adds many more State facilities as well as all federal facilities located in urbanized areas. All of these State and federal facilities that fit the definition of a small MS4 must be covered by a storm water management program. The individual permitting authorities must decide what type of permit is most applicable.

The existing NPDES storm water program already regulates storm water from federally or State-operated industrial sources. Federal or State facilities that are currently regulated due to their industrial discharges may already be implementing some of today's rule requirements.

EPA received comments that questioned the apparent inconsistency between regulating a federal facility such as a hospital and not regulating a similar private facility. Normally, this type of private facility is regulated by the MS4. EPA believes that federal facilities are subject to local water quality regulations, including storm water requirements, by virtue of the waiver of sovereign immunity in CWA section 313. However, there are special problems faced by MS4s in their efforts to regulate federal facilities that have not been encountered in regulating

similar private facilities. To ensure comprehensive coverage, today's rule merely clarifies the need for permit coverage for these federal facilities.

i. Combined Sewer Systems (CSS).

The definition of small MS4s does not include combined sewer systems. A combined sewer system is a wastewater collection system that conveys sanitary wastewater and storm water through a single set of pipes to a publicly-owned treatment works (POTW) for treatment before discharging to a receiving waterbody. During wet weather events when the capacity of the combined sewer system is exceeded, the system is designed to discharge prior to the POTW treatment plant directly into a receiving waterbody. Such an overflow is a combined sewer overflow or CSO. Combined sewer systems are not subject to existing regulations for municipal storm water discharges, nor will they be subject to today's regulations. EPA addresses combined sewer systems and CSOs in the National Combined Sewer Overflow (CSO) Control Policy issued on April 19, 1994 (59 FR 18688). The CSO Control Policy contains provisions for developing appropriate, site-specific NPDES permit requirements for combined sewer systems. CSO discharges are subject to limitations based on the best available technology economically achievable for toxic pollutants and based on the best conventional pollutant control technology for conventional pollutants. MS4s are subject to a different technology standard for all pollutants, specifically to reduce pollutants to the maximum extent practicable.

Some municipalities are served by both separate storm sewer systems and combined sewer systems. If such a municipality is located within an urbanized area, only the separate storm sewer systems within that municipality is included in the NPDES storm water program and subject to today's final rule. If the municipality is not located in an urbanized area, then the NPDES permitting authority has discretion as to whether the discharges from the separate storm sewer system is subject to today's final rule. The NPDES permitting authority will use the same process to designate discharges from portions of an MS4 for permit coverage where the municipality is also served by a combined sewer system.

EPA recognizes that municipalities that have both combined and separate storm sewer systems may wish to find ways to develop a unified program to meet all wet weather water pollution control requirements more efficiently. In the proposal to today's final rule, EPA sought comment on ways to achieve

such a unified program. Many municipalities that are served by CSSs and MS4s commented that it is inequitable to force them to comply with Phase II at this time because implementation of the CSO Control Policy through their NPDES permits already imposes a significant financial burden. They requested an extension of the implementation time frame. They did not provide ideas on how to unify the two programs. EPA encourages permitting authorities to work with these municipalities as they develop and begin implementation of their CSO and storm water management programs. If both sets of requirements are carefully coordinated early, a cost-effective wet weather program can be developed that will address both CSO and storm water requirements.

ii. Owners/Operators. Several commenters mentioned the difference between the existing storm water application requirement for municipal operators and the proposed municipal requirement for owners or operators to apply. They felt that this inconsistency is confusing. The preamble to the existing regulations makes numerous references to owner/operator so there was no intent to make a clear distinction between Phase I and Phase II. Section 122.21(b) states that when the owner and operator are different, the operator must obtain the permit. MS4s often have several operators. The owner may be responsible for one part of the system and a regional authority may be responsible for other aspects. EPA proposed the "owner or operator" language to convey this dual responsibility. However, when the owner is responsible for some part of a storm water management plan, it is also an operator.

EPA has revised the regulation language to clarify that "an operator" must apply for a permit. When responsibilities for the MS4 are shared, all operators must apply.

c. Regulated Small MS4s

In today's final rule, all small MS4s located in an urbanized area are automatically designated as "regulated" small MS4s provided that they were not previously designated into the existing storm water program. Unlike medium and large MS4s under the existing storm water regulations, not all small MS4s are designated under today's final rule. Therefore, today's rule distinguishes between "small" MS4s and "regulated small" MS4s.

EPA's definition of "regulated small MS4s" in the proposal to today's rule included mention of incorporated places and counties. Along with the

definition, EPA included Appendices 6 and 7 to assist in the identification of areas that would probably require coverage as "automatically designated" (Appendix 6) or "potentially designated" (Appendix 7). The definition and the appendices raised many questions about exactly who was required to comply with the proposed requirements. Commenters raised issues about the definition of "incorporated place" and the status of towns, townships, and other places that are not considered incorporated by the Census Bureau. They also asked about special districts, regional authorities, MS4s already regulated, and other questions in order to clarify the rule's coverage.

EPA has revised § 122.32(a) to clarify that discharges are regulated under today's rule if they are from a small MS4 that is in an urbanized area and has not received a waiver or they are designated by the permitting authority. Today's rule does not regulate the county, city, or town. Today's rule regulates the MS4. Therefore, even though a county may be listed in Appendix 6, if that county does not own or operate the municipal storm sewer systems, the county does not have to submit an application or develop a storm water management program. If another entity does own or operate an MS4 within the county, for example, a regional utility district, that other entity needs to submit the application and develop the program.

Some commenters suggested that EPA should change the rule language to specifically allow regional authorities to be the permitted entity and to allow small MS4s to apply as co-permittees. EPA believes that the best way to clarify that regional authorities can be the primary permitted entity is the change to § 122.32(a) and the explanation above. Because EPA assumes that today's regulation will be implemented through general permits, MS4s will not be co-permittees under a general permit in the same manner as under individual permits. EPA has added § 122.33(a)(4) and made a minor change to § 122.35(a) to clarify that small MS4s can work together to share the responsibilities of a storm water management program. This is discussed further in Section II.H.3.c.iv below.

The proposed rule stated that when a county or Federal Indian reservation is only partially included in an urbanized area, only MS4s in the urbanized portion of the county or Federal Indian reservation would be regulated. In the rare cases when an incorporated place is only partially included in the urbanized area, the entire incorporated place would be regulated. EPA received comments asking about towns and

townships, because they were not considered to be incorporated areas according to the Census Bureau's definition. Would the whole town/township be covered or only the part of the town/township in the urbanized area? States use many different types of systems in their geographical divisions. Some towns are similar to incorporated cities and others are large areas that are more similar to counties. Some commenters thought that the urbanized area boundary was arbitrary, and if part of a town or county was covered, it all should be covered. Other commenters noted that some townships and counties encompass very large areas of which only a small portion is urbanized. Due to the great variety of situations, EPA has decided that for all geographical entities, only MS4s in the urbanized area are automatically designated. The population densities associated with the Census Bureau's designation of urbanized areas provide the basis for designation of these areas to protect water quality. This focused designation provides for consistency and allows for flexibility on the part of the MS4 and the permitting authority. In those situations where an incorporated place or a town is not all in an "urbanized area", there is a good possibility that it is served by more than one MS4. In those cases where the area is served by the same MS4, it makes sense to develop a storm water program for the whole area. Permitting authorities may also decide to designate all MS4s within a county or township, if they believe it is necessary to protect water quality.

Most operators of MS4s will not need to independently determine the status of coverage under today's rule. EPA has revised the proposed Appendices 6 and 7 to include towns and townships. Therefore, these appendices will alert most MS4s as to whether they are likely to be covered under today's rule. However, each permitting authority must make the decision as to who requires coverage. Most likely, an illustrative list of the regulated areas will be published with the general permit. If not, the operator can contact its permitting authority or the Bureau of the Census to find out if their separate storm sewer systems are within an urbanized area.

i. Urbanized Area Description. Under the Bureau of the Census definition of "urbanized area," adopted by EPA for the purposes of today's final rule, "an urbanized area (UA) comprises a place and the adjacent densely settled surrounding territory that together have a minimum population of 50,000 people." The proposal to today's rule provided the full definition and case

studies to help explain the census category of "urbanized area." Appendix 2 is a simplified urbanized area illustration to help demonstrate the concept of urbanized areas in relation to today's final rule. The "urbanized area" is the shaded area that includes within its boundaries incorporated places, a portion of a Federal Indian reservation, portions of two counties, an entire town, and portions of another town. All small MS4s located in the shaded area are covered by the rule, unless and until waived by the permitting authority. Any small MS4s located outside of the shaded area are subject to potential designation by the permitting authority.

There are 405 urbanized areas in the United States that cover 2 percent of total U.S. land area and contain approximately 63 percent of the nation's population (see Appendix 3 for a listing of urbanized areas of the United States and Puerto Rico). These numbers include U.S. Territories, although Puerto Rico is the only territory to have Census-designated urbanized areas. Urbanized areas constitute the largest and most dense areas of settlement. The purpose of determining an "urbanized area" is to delineate the boundaries of development and map the actual built-up urban area. The Bureau of the Census geographers liken it to flying over an urban area and drawing a line around the boundary of the built-up area as seen from the air.

Using data from the latest decennial census, the Census Bureau applies the urbanized area definition nationwide (including U.S. Tribes and Territories) and determines which places and counties are included within each urbanized area. For each urbanized area, the Bureau provides full listings of who is included, as well as detailed maps and special CD-ROM files for use with computerized mapping systems (such as GIS). Each State's data center receives a copy of the list, and some maps, automatically. The States also have the CD-ROM files and a variety of publications available to them for reference from the Bureau of the Census. In addition, local or regional planning agencies may have urbanized area files already. New listings for urbanized areas based on the 2000 Census will be available by July/August 2001, but the more comprehensive computer files will not be available until late 2001/early 2002.

Additional designations based on subsequent census years will be governed by the Bureau of the Census' definition of an urbanized area in effect for that year. Based on historical trends, EPA expects that any area determined by the Bureau of the Census to be

included within an urbanized area as of the 1990 Census will not later be excluded from the urbanized area as of the 2000 Census. However, it is important to note that even if this situation were to occur, for example, due to a possible change in the Bureau of the Census' urbanized area definition, a small MS4 that is automatically designated into the NPDES program for storm water under an urbanized area calculation for any given Census year will remain regulated regardless of the results of subsequent urbanized area calculations.

ii. Rationale for Using Urbanized Areas. EPA is using urbanized areas to automatically designate regulated small MS4s on a nationwide basis for several reasons: (1) studies and data show a high correlation between degree of development/urbanization and adverse impacts on receiving waters due to storm water (U.S. EPA, 1983; Driver et al., 1985; Pitt, R.E. 1991. "Biological Effects of Urban Runoff Discharges." Presented at the Engineering Foundation Conference: *Urban Runoff and Receiving Systems; An Interdisciplinary Analysis of Impact, Monitoring and Management*, August 1991. Mt. Crested Butte, CO. American Society of Civil Engineers, New York. 1992.; Pitt, R.E. 1995. "Biological Effects of Urban Runoff Discharges," in *Storm water Runoff and Receiving Systems: Impact, Monitoring, and Assessment*. Lewis Publishers, New York.; Galli, J. 1990. *Thermal Impacts Associated with Urbanization and Storm water Management Best Management Practices*. Prepared for the Sediment and Storm water Administration of the Maryland Department of the Environment.; Klein, 1979), (2) the blanket coverage within the urbanized area encourages the watershed approach and addresses the problem of "donut-holes," where unregulated areas are surrounded by areas currently regulated (storm water discharges from donut hole areas present a problem due to their contributing uncontrolled adverse impacts on local waters, as well as by frustrating the attainment of water quality goals of neighboring regulated communities), (3) this approach targets present and future growth areas as a preventative measure to help ensure water quality protection, and (4) the determination of urbanized areas by the Bureau of the Census allows operators of small MS4s to quickly determine whether they are included in the NPDES storm water program as a regulated small MS4.

Urbanized areas have experienced significant growth over the past 50 years. According to EPA calculations

based on Census data from 1980 to 1990, the national average rate of growth in the United States during that 10-year period was more than 4 percent. For the same period, the average growth within urbanized areas was 15.7 percent and the average for outside of urbanized areas was just more than 1 percent. The new development occurring in these growing areas can provide some of the best opportunities for implementing cost-effective storm water management controls.

EPA received many comments on the proposal to designate discharges based on location within urbanized areas. EPA considered numerous other approaches, several of which are discussed in the proposal to today's final rule. Several commenters wanted designation to be based on proven water quality problems rather than inclusion in an urbanized area. One commenter proposed an approach based on the CWA 303(d) listing of impaired waters and the wasteload allocation conducted under the TMDL process. (See section II.L. on the section 303(d) and TMDL process). The commenter's proposal would designate small MS4s on a case-by-case basis, covering only those discharges where receiving streams are shown to have water quality problems, particularly a failure to meet water quality standards, including designated uses. The commenter further described a non-NPDES approach where a State would require cost-effective measures based on a proportionate share under a waste load allocation, equitably allocated among all pollutant contributors. These waste load allocations would be developed with input from all stakeholders, and remedial measures would be implemented in a phased manner based on the probability of results and/or economic feasibility. The States would then periodically reassess the receiving streams to determine whether the remedial measures are working, and if not, require additional control measures using the same procedure used to establish the initial measures. What the commenter describes is almost a TMDL.

EPA considered a remedial approach based on water quality impairment and rejected it for failure to prevent almost certain degradation caused by urban storm water. EPA's main concern in opting not to take a case-by-case approach to designation was that this approach would not provide controls for storm water discharges in receiving streams until after a site-specific demonstration of adverse water quality impact. The commenter's suggestion would do nothing to prevent pollution in waters that may be meeting water

quality standards, including supporting designated uses. The approach would also rely on identifying storm water management programs following comprehensive watershed plans and TMDL development. In most States, water quality assessments have traditionally been conducted for principal mainstream rivers and their major tributaries, not all surface waters. The establishment of TMDLs nationwide will take many years, and many States will conduct additional monitoring to determine water quality conditions prior to establishing TMDLs. In addition, a case-by-case approach would not address the problem of "donut holes" within urbanized areas and a lack of consistency among similarly situated municipal systems would remain commonplace. After careful consideration of all comments, EPA still believes that the approach in today's rule is the most appropriate to protect water quality. Protection includes prevention as well as remediation.

d. Municipal Designation by the Permitting Authority

Today's final rule also allows NPDES permitting authorities to designate MS4s that should be included in the storm water program as regulated small MS4s but are not located within urbanized areas. The final rule requires, at a minimum, that a set of designation criteria be applied to all small MS4s within a jurisdiction that serves a population of at least 10,000 and has a population density of at least 1,000. Appendix 7 to this preamble provides an illustrative list of places that the Agency anticipates meet this criteria. In addition, any small MS4 may be the subject of a petition to the NPDES permitting authority for designation. See Section II.G, NPDES Permitting Authority's Role for more details on the designation and petition processes. EPA believes that the approach of combining nationwide and local designation to determine municipal coverage balances the potential for significant adverse impacts on water quality with local watershed protection and planning efforts.

e. Waiving the Requirements for Small MS4s

Today's final rule includes some flexibility in the nationwide coverage of all small MS4s located in urbanized areas by providing the NPDES permitting authority with the discretion to waive the otherwise applicable requirements of the smallest MS4s that are not causing the impairment of a receiving water body. Qualifications for

the waiver vary depending on whether the MS4 serves a population under 1,000 or a population between 1,000 and 10,000. Note that even if a small MS4 has requirements waived, it can subsequently be brought back into the program if circumstances change. See Section II.G, NPDES Permitting Authority's Role, for more details on this process.

3. Municipal Permit Requirements

a. Overview

i. Summary of Permitting Options. Today's rule outlines six minimum control measures that constitute the framework for a storm water discharge control program for regulated small MS4s that, when properly implemented, will reduce pollutants to the maximum extent practicable (MEP). These six minimum control measures are specified in § 122.34(b) and are discussed below in section "II.H.3.b, Program Requirements-Minimum Control Measures." All operators of regulated small MS4s are required to obtain coverage under an NPDES permit, unless the requirement is waived by the permitting authority in accordance with today's rule. Implementation of § 122.34(b) may be required either through an individual permit or, if the State or EPA makes one available to the facility, through a general permit. The process for issuing and obtaining these permits is discussed below in section "II.H.3.c, Application Requirements."

As an alternative to implementing a program that complies with the requirements of § 122.34, today's rule provides operators of regulated small MS4s with the option of applying for an individual permit under § 122.26(d). The permit application requirements in § 122.26 were originally drafted to apply to medium and large MS4s. Although EPA believes that the requirements of § 122.34 provide a regulatory option that is appropriate for most small MS4s, the operators of some small MS4s may prefer more individualized requirements. This alternative permitting option for regulated small MS4s that wish to develop their own program is discussed below in section "II.H.3.c.iii. Alternative Permit Option." The second alternative permitting option for regulated small MS4s is to become co-permittees with a medium or large MS4 regulated under § 122.26(d), as discussed below in section "II.H.3.c.v. Joint Permit Programs."

ii. Water Quality-Based Requirements. Any NPDES permit issued under today's rule must, at a minimum, require the operator to develop, implement, and

enforce a storm water management program designed to reduce the discharge of pollutants from a regulated system to the MEP, to protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act (see MEP discussion in the following section). Absent evidence to the contrary, EPA presumes that a small MS4 program that implements the six minimum measures in today's rule does not require more stringent limitations to meet water quality standards. Proper implementation of the measures will significantly improve water quality. As discussed further below, however, small MS4 permittees should modify their programs if and when available information indicates that water quality considerations warrant greater attention or prescriptiveness in specific components of the municipal program. If the program is inadequate to protect water quality, including water quality standards, then the permit will need to be modified to include any more stringent limitations necessary to protect water quality.

Regardless of the basis for the development of the effluent limitations (whether designed to implement the six minimum measures or more stringent or prescriptive limitations to protect water quality), EPA considers narrative effluent limitations requiring implementation of BMPs to be the most appropriate form of effluent limitations for MS4s. CWA section 402(p)(3)(b)(iii) expresses a preference for narrative rather than numeric effluent limits, for example, by reference to "management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." 33 U.S.C. 1342(p)(3)(B)(iii). EPA determines that pollutants from wet weather discharges are most appropriately controlled through management measures rather than end-of-pipe numeric effluent limitations. As explained in the Interim Permitting Policy for Water Quality-Based Effluent Limitations in Storm Water Permits, issued on August 1, 1996 [61 FR 43761 (November 26, 1996)], EPA believes that the currently available methodology for derivation of numeric water quality-based effluent limitations is significantly complicated when applied to wet weather discharges from MS4s (compared to continuous or periodic batch discharges from most other types of discharge). Wet weather discharges from MS4s introduce a high degree of variability in the inputs to the models currently available for

derivation of water quality based effluent limitations, including assumptions about instream and discharge flow rates, as well as effluent characterization. In addition, EPA anticipates that determining compliance with any such numeric limitations may be confounded by practical limitations in sample collection.

In the first two to three rounds of permit issuance, EPA envisions that a BMP-based storm water management program that implements the six minimum measures will be the extent of the NPDES permit requirements for the large majority of regulated small MS4s. Because the six measures represent a significant level of control if properly implemented, EPA anticipates that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards, so that additional, more stringent and/or more prescriptive water quality based effluent limitations will be unnecessary.

If a small MS4 operator implements the six minimum control measures in § 122.34(b) and the discharges are determined to cause or contribute to non-attainment of an applicable water quality standard, the operator needs to expand or better tailor its BMPs within the scope of the six minimum control measures. EPA envisions that this process will occur during the first two to three permit terms. After that period, EPA will revisit today's regulations for the municipal separate storm sewer program.

If the permitting authority (rather than the regulated small MS4 operator) needs to impose additional or more specific measures to protect water quality, then that action will most likely be the result of an assessment based on a TMDL or equivalent analysis that determines sources and allocations of pollutant(s) of concern. EPA believes that the small MS4's additional requirements, if any, should be guided by its equitable share based on a variety of considerations, such as cost effectiveness, proportionate contribution of pollutants, and ability to reasonably achieve wasteload reductions. Narrative effluent limitations in the form of BMPs may still be the best means of achieving those reductions.

See Section II.L, Water Quality Issues, for further discussion of this approach to permitting, consistent with EPA's interim permitting guidance. Pursuant to CWA section 510, States implementing their own NPDES programs may develop more stringent or

more prescriptive requirements than those in today's rule.

EPA's interpretation of CWA section 402(p)(3)(B)(iii) was recently reviewed by the Ninth Circuit in *Defenders of Wildlife, et al v. Browner*, No. 98-71080 (September 15, 1999). The Court upheld the Agency's action in issuing five MS4 permits that included water quality-based effluent limitations. The Court did, however, disagree with EPA's interpretation of the relationship between CWA sections 301 and 402(p). The Court reasoned that MS4s are not compelled by section 301(b)(1)(C) to meet all State water quality standards, but rather that the Administrator or the State may rely on section 402(p)(3)(B)(iii) to require such controls. Accordingly, the *Defenders of Wildlife* decision is consistent with the Agency's 1996 "Interim Permitting Policy for Water Quality-Based Effluent Limitations in Storm Water Permits."

As noted, the 1996 Policy describes how permits would implement an iterative process using BMPs, assessment, and refocused BMPs, leading toward attainment of water quality standards. The ultimate goal of the iteration would be for water bodies to support their designated uses. EPA believes this iterative approach is consistent with and implements section 301(b)(1)(C), notwithstanding the Ninth Circuit's interpretation. As an alternative to basing these water quality-based requirements on section 301(b)(1)(C), however, EPA also believes the iterative approach toward attainment of water quality standards represents a reasonable interpretation of CWA section 402(p)(3)(B)(iii). For this reason, today's rule specifies that the "compliance target" for the design and implementation of municipal storm water control programs is "to reduce pollutants to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the CWA." The first component, reductions to the MEP, would be realized through implementation of the six minimum measures. The second component, to protect water quality, reflects the overall design objective for municipal programs based on CWA section 402(p)(6). The third component, to implement other applicable water quality requirements of the CWA, recognizes the Agency's specific determination under CWA section 402(p)(3)(B)(iii) of the need to achieve reasonable further progress toward attainment of water quality standards according to the iterative BMP process, as well as the determination that State or EPA officials who establish TMDLs could allocate waste loads to

MS4s, as they would to other point sources.

EPA does not presume that water quality will be protected if a small MS4 elects not to implement all of the six minimum measures and instead applies for alternative permit limits under § 122.26(d). Operators of such small MS4s that apply for alternative permit limits under § 122.26(d) must supply additional information through individual permit applications so that the permit writer can determine whether the proposed program reduces pollutants to the MEP and whether any other provisions are appropriate to protect water quality and satisfy the appropriate water quality requirements of the Clean Water Act.

iii. *Maximum Extent Practicable.* Maximum extent practicable (MEP) is the statutory standard that establishes the level of pollutant reductions that operators of regulated MS4s must achieve. The CWA requires that NPDES permits for discharges from MS4s "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods." CWA Section 402(p)(3)(B)(iii). This section also calls for "such other provisions as the [EPA] Administrator or the State determines appropriate for the control of such pollutants." EPA interprets this standard to apply to all MS4s, including both existing regulated (large and medium) MS4s, as well as the small MS4s regulated under today's rule.

For regulated small MS4s under today's rule, authorization to discharge may be under either a general permit or individual permit, but EPA anticipates and expects that general permits will be the most common permit mechanism. The general permit will explain the steps necessary to obtain permit authorization. Compliance with the conditions of the general permit and the series of steps associated with identification and implementation of the minimum control measures will satisfy the MEP standard. Implementation of the MEP standard under today's rule will typically require the permittee to develop and implement appropriate BMPs to satisfy each of the required six minimum control measures.

In issuing the general permit, the NPDES permitting authority will establish requirements for each of the minimum control measures. Permits typically will require small MS4 permittees to identify in their NOI the BMPs to be performed and to develop the measurable goals by which

implementation of the BMPs can be assessed. Upon receipt of the NOI from a small MS4 operator, the NPDES permitting authority will have the opportunity to review the NOI to verify that the identified BMPs and measurable goals are consistent with the requirement to reduce pollutants under the MEP standard, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. If necessary, the NPDES permitting authority may ask the permittee to revise their mix of BMPs, for example, to better reflect the MEP pollution reduction requirement. Where the NPDES permit is not written to implement the minimum control measures specified under § 122.34(b), for example in the case of an individual permit under § 122.33(b)(2)(ii), the MEP standard will be applied based on the best professional judgment of the permit writer.

Commenters argued that MEP is, as yet, an undefined term and that EPA needs to further clarify the MEP standards by providing a regulatory definition that includes recognition of cost considerations and technical feasibility. Commenters argued that, without a definition, the regulatory community is not adequately on notice regarding the standard with which they need to comply. EPA disagrees that affected MS4 permittees will lack notice of the applicable standard. The framework for the small MS4 permits described in this notice provides EPA's interpretation of the standard and how it should be applied.

EPA has intentionally not provided a precise definition of MEP to allow maximum flexibility in MS4 permitting. MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis. EPA envisions that this evaluative process will consider such factors as conditions of receiving waters, specific local concerns, and other aspects included in a comprehensive watershed plan. Other factors may include MS4 size, climate, implementation schedules, current ability to finance the program, beneficial uses of receiving water, hydrology, geology, and capacity to perform operation and maintenance.

The pollutant reductions that represent MEP may be different for each small MS4, given the unique local hydrologic and geologic concerns that may exist and the differing possible pollutant control strategies. Therefore, each permittee will determine appropriate BMPs to satisfy each of the six minimum control measures through an evaluative process. Permit writers may evaluate small MS4 operator's

proposed storm water management controls to determine whether reduction of pollutants to the MEP can be achieved with the identified BMPs.

EPA envisions application of the MEP standard as an iterative process. MEP should continually adapt to current conditions and BMP effectiveness and should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards. If, after implementing the six minimum control measures there is still water quality impairment associated with discharges from the MS4, after successive permit terms the permittee will need to expand or better tailor its BMPs within the scope of the six minimum control measures for each subsequent permit. EPA envisions that this process may take two to three permit terms.

One commenter observed that MEP is not static and that if the six minimum control measures are not achieving the necessary water quality improvements, then an MS4 should be expected to revise and, if necessary, expand its program. This concept, it is argued, must be clearly part of the definition of MEP and thus incorporated into the binding and operative aspects of the rule. As is explained above, EPA believes that it is. The iterative process described above is intended to be sensitive to water quality concerns. EPA believes that today's rule contains provisions to implement an approach that is consistent with this comment.

b. Program Requirements' Minimum Control Measures

A regulated small MS4 operator must develop and implement a storm water management program designed to reduce the discharge of pollutants from their MS4 to protect water quality. The storm water management program must include the following six minimum measures.

i. *Public Education and Outreach on Storm Water Impacts.* Under today's final rule, operators of small MS4s must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps to reduce storm water pollution. The public education program should inform individuals and households about the problem and the steps they can take to reduce or prevent storm water pollution.

EPA believes that as the public gains a greater understanding of the storm water program, the MS4 is likely to gain

more support for the program (including funding initiatives). In addition, compliance with the program will probably be greater if the public understands the personal responsibilities expected of them. Well-informed citizens can act as formal or informal educators to further disseminate information and gather support for the program, thus easing the burden on the municipalities to perform all educational activities.

MS4s are encouraged to enter into partnerships with their States in fulfilling the public education requirement. It may be more cost-effective to utilize a State education program instead of numerous MS4s developing their own programs. MS4 operators are also encouraged to work with other organizations (e.g., environmental, nonprofit and industry organizations) that might be able to assist in fulfilling this requirement.

The public education program should be tailored, using a mix of locally appropriate strategies, to target specific audiences and communities (particularly minority and disadvantaged communities). Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed and beach cleanups. Operators of MS4s may use storm water educational information provided by the State, Tribe, EPA, or environmental, public interest, trade organizations, or other MS4s. Examples of successful public education efforts concerning polluted runoff can be found in many State nonpoint source pollution control programs under CWA section 319.

The public education program should inform individuals and households about steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance, ensuring the use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes. Additionally, the program could inform individuals and groups on how to become involved in local stream and beach restoration activities as well as activities coordinated by youth service and conservation corps and other citizen groups. Finally, materials or outreach programs should be directed toward targeted groups of commercial,

industrial, and institutional entities likely to have significant storm water impacts. For example, MS4 operators should provide information to restaurants on the impact of grease clogging storm drains and to auto garages on the impacts of used oil discharges.

EPA received comments from representatives of State DOTs and U.S. Department of Defense (DOD) installations seeking exemption from the public education requirement. While today's rule does not exempt DOTs and military bases from the user education requirement, the Agency believes the flexibility inherent in the Rule addresses many of the concerns expressed by these commenters.

Certain DOT representatives commented that if their agencies were not exempt from the user education measure's requirements, they should at least be allowed to count DOT employee education as an adequate substitute. EPA supports the use of existing materials and programs, granted such materials and programs meet the rule's requirement that the MS4 user community (*i.e.*, the public) is also educated concerning the impacts of storm water discharges on water bodies and the steps to reduce storm water pollution.

Finally, certain DOD representatives requested that "public," as applied to their installations, be defined as the resident and employee populations within the fence line of the facility. EPA agrees that the education effort should be directed toward those individuals who frequent the federally owned land (*i.e.*, residents and individuals who come there to work and use the MS4 facilities).

EPA also received a number of comments from municipalities stating that education would be more thorough and cost effective if accomplished by EPA on the national level. EPA believes that a collaborative State and local approach, in conjunction with significant EPA technical support, will best meet the goal of targeting, and reaching, specific local audiences. EPA technical support will include a tool box which will contain fact sheets, guidance documents, an information clearinghouse, and training and outreach efforts.

Finally, EPA received comments expressing concern that the public education program simply encourages the distribution of printed material. EPA is sensitive to this concern. Upon evaluation, the Agency made changes to the proposal's language for today's rule. The language has been changed to reflect EPA's belief that a successful

program is one that includes a variety of strategies locally designed to reach specific audiences.

ii. Public Involvement/Participation. Public involvement is an integral part of the small MS4 storm water program. Accordingly, today's final rule requires that the municipal storm water management program must comply with applicable State and local public notice requirements. Section 122.34(b)(2) recommends a public participation process with efforts to reach out and engage all economic and ethnic groups. EPA believes there are two important reasons why the public should be allowed and encouraged to provide valuable input and assistance to the MS4's program.

First, early and frequent public involvement can shorten implementation schedules and broaden public support for a program. Opportunities for members of the public to participate in program development and implementation could include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts. Moreover, members of the public may be less likely to raise legal challenges to a MS4's storm water program if they have been involved in the decision making process and program development and, therefore, internalize personal responsibility for the program themselves.

Second, public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments. This is particularly important if the MS4's storm water program is to be implemented on a watershed basis. Interested stakeholders may offer to volunteer in the implementation of all aspects of the program, thus conserving limited municipal resources.

EPA recognizes that there are a number of challenges associated with public involvement. One challenge is in engaging people in the public meeting and program design process. Another challenge is addressing conflicting viewpoints. Nevertheless, EPA strongly believes that these challenges can be addressed by use of an aggressive and inclusive program. Section II.K. provides further discussion on public involvement.

A number of municipalities sought clarification from EPA concerning what the public participation program must

actually include. In response, the actual requirements are minimal, but the Agency's recommendations are more comprehensive. The public participation program must only comply with applicable State and local public notice requirements. The remainder of the preamble, as well as the Explanatory Note accompanying the regulatory text, provide guidance to the MS4s concerning what elements a successful and inclusive program should include. EPA will provide technical support as part of the tool box (*i.e.*, providing model public involvement programs, conducting public workshops, *etc.*) to assist MS4 operators meet the intent of this measure.

Finally, the Agency encourages MS4s to seek public participation prior to submitting an NOI. For example, public participation at this stage will allow the MS4 to involve the public in developing the BMPs and measurable goals for their NOI.

iii. Illicit Discharge Detection and Elimination. Discharges from small MS4s often include wastes and wastewater from non-storm water "illicit" discharges. Illicit discharge is defined at 40 CFR 122.26(b)(2) as any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire fighting activities. As detailed below, other sources of non-storm water, that would otherwise be considered illicit discharges, do not need to be addressed unless the operator of the MS4 identifies one or more of them as a significant source of pollutants into the system. EPA's Nationwide Urban Runoff Program (NURP) indicated that many storm water outfalls still discharge during substantial dry periods. Pollutant levels in these dry weather flows were shown to be high enough to significantly degrade receiving water quality. Results from a 1987 study conducted in Sacramento, California, revealed that slightly less than one-half of the water discharged from a municipal separate storm sewer system was not directly attributable to precipitation runoff (U.S. Environmental Protection Agency, Office of Research and Development, 1993. *Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems—A User's Guide*. Washington, DC EPA 600/R-92/238.) A significant portion of these dry weather flows results from illicit and/or inappropriate discharges and connections to the municipal separate storm sewer system. Illicit discharges enter the system through either direct connections (*e.g.*, wastewater piping either mistakenly or

deliberately connected to the storm drains) or indirect connections (*e.g.*, infiltration into the storm drain system or spills collected by drain inlets).

Under the existing NPDES program for storm water, permit applications for large and medium MS4s are to include a program description for effective prohibition against non-storm water discharges into their storm sewers (see 40 CFR 122.26 (d)(1)(v)(B) and (d)(1)(iv)(B)). Further, EPA believes that in implementing municipal storm water management plans under these permits, large and medium MS4 operators generally found their illicit discharge detection and elimination programs to be cost-effective. Properly implemented programs also significantly improved water quality.

In today's rule, any NPDES permit issued to an operator of a regulated small MS4 must, at a minimum, require the operator to develop, implement and enforce an illicit discharge detection and elimination program. Inclusion of this measure for regulated small MS4s is consistent with the "effective prohibition" requirement for large and medium MS4s. Under today's rule, the NPDES permit will require the operator of a regulated small MS4 to: (1) Develop (if not already completed) a storm sewer system map showing the location of all outfalls, and names and location of all waters of the United States that receive discharges from those outfalls; (2) to the extent allowable under State, Tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed; (3) develop and implement a plan to detect and address illicit discharges, including illegal dumping, to the system; and (4) inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

The illicit discharge and elimination program need only address the following categories of non-storm water discharges if the operator of the small MS4 identifies them as significant contributors of pollutants to its small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and

wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the definition of illicit discharge and only need to be addressed where they are identified as significant sources of pollutants to waters of the United States). If the operator of the MS4 identifies one or more of these categories of sources to be a significant contributor of pollutants to the system, it could require specific controls for that category of discharge or prohibit the discharges completely.

Several comments were received on the mapping requirements of the proposal. Most comments said that more flexibility should be given to the MS4s to determine their mapping needs, and that resources could be better spent in addressing problems once the illicit discharges are detected. EPA reviewed the mapping requirements in the proposed rule and agrees that some of the information is not necessary in order to begin an illicit discharge detection and elimination program. Today's rule requires a map or set of maps that show the locations of all outfalls and names and locations of receiving waters. Knowing the locations of outfalls and receiving waters are necessary to be able to conduct dry weather field screening for non-storm water flows and to respond to illicit discharge reports from the public. EPA recommends that the operator collect any existing information on outfall locations (*e.g.*, review city records, drainage maps, storm drain maps), and then conduct field surveys to verify the locations. It will probably be necessary to "walk" (*i.e.* wade small receiving waters or use a boat for larger receiving waters) the streambanks and shorelines, and it may take more than one trip to locate all outfalls. A coding system should be used to mark and identify each outfall. MS4 operators have the flexibility to determine the type (*e.g.* topographic, GIS, hand or computer drafted) and size of maps which best meet their needs. The map scale should be such that the outfalls can be accurately located. Once an illicit discharge is detected at an outfall, it may be necessary to map that portion of the storm sewer system leading to the outfall in order to locate the source of the discharge.

Several comments requested clarification of the requirement to develop and implement a plan to detect and eliminate illicit discharges. EPA recommends that plans include procedures for the following: locating priority areas; tracing the source of an illicit discharge; removing the source of the discharge; and program evaluation

and assessment. EPA recommends that MS4 operators identify priority areas (*i.e.*, problem areas) for more detailed screening of their system based on higher likelihood of illicit connections (*e.g.*, areas with older sanitary sewer lines), or by conducting ambient sampling to locate impacted reaches. Once priority areas are identified, EPA recommends visually screening outfalls during dry weather and conducting field tests, where flow is occurring, of selected chemical parameters as indicators of the discharge source. EPA's manual for investigation of inappropriate pollutant entries into the storm drainage system (EPA, 1993) suggests the following parameter list: specific conductivity, fluoride and/or hardness concentration, ammonia and/or potassium concentration, surfactant and/or fluorescence concentration, chlorine concentration, pH and other chemicals indicative of industrial sources. The manual explains why each parameter is a good indicator and how the information can be used to determine the type of source flow. The Agency is not recommending that fluoride and chlorine, generally used to locate potable water discharges, be addressed under this program, therefore a short list of parameters may include conductivity, ammonia, surfactant and pH. Some MS4s have found it useful to measure for fecal coliform or *E. coli* in their testing program. Observations of physical characteristics of the discharge are also helpful such as flow rate, temperature, odor, color, turbidity, floatable matter, deposits and stains, and vegetation.

The implementation plan should also include procedures for tracing the source of an illicit discharge. Once an illicit discharge is detected and field tests provide source characteristics, the next step is to determine the actual location of the source. Techniques for tracing the discharge to its place of origin may include: following the flow up the storm drainage system via observations and/or chemical testing in manholes or in open channels; televising storm sewers; using infrared and thermal photography; conducting smoke or dye tests.

The implementation plan should also include procedures for removing the source of the illicit discharge. The first step may be to notify the property owner and specify a length of time for eliminating the discharge. Additional notifications and escalating legal actions should also be described in this part of the plan.

Finally, the implementation plan should include procedures for program evaluation and assessment. Procedures

could include documentation of actions taken to locate and eliminate illicit discharges such as: number of outfalls screened, complaints received and corrected, feet of storm sewers televised, numbers of discharges and quantities of flow eliminated, number of dye or smoke tests conducted. Appropriate records of such actions should be kept and should be submitted as part of the annual reports for the first permit term, as specified by the permitting authority (reports only need to be submitted in years 2 and 4 in later permits). For more on reporting requirements, see § 122.34(g).

EPA received comments regarding an MS4's legal authority beyond its jurisdictional boundaries to inspect or take enforcement against illicit discharges. EPA recognizes that illicit flows may originate in one jurisdiction and cross into one or more jurisdictions before being discharged at an outfall. In such instances, EPA expects the MS4 that detects the illicit flow to trace it to the point where it leaves their jurisdiction and notify the adjoining MS4 of the flow, and any other physical or chemical information. The adjoining MS4 should then trace it to the source or to the location where it enters their jurisdiction. The process of notifying the adjoining MS4 should continue until the source is located and eliminated. In addition, because any non-storm water discharge to waters of the U.S. through an MS4 is subject to the prohibition against unpermitted discharges pursuant to CWA section 301 (a), remedies are available under the federal enforcement provisions of CWA sections 309 and 505.

EPA requested and received comments regarding the prohibition and enforcement provision for this minimum measure. Commenters specifically questioned the proposal that the operator only has to implement the appropriate prohibition and enforcement procedures "to the extent allowable under State or Tribal law." They raised concerns that by qualifying prohibition and enforcement procedures in this manner, the operator could altogether ignore this minimum measure where affirmative legal authority did not exist. Comments suggested that EPA require States to grant authority to those municipalities where it did not exist. Other comments, however, stated that municipalities cannot exercise legal authority not granted to them under State law, which varies considerably from one State to another. EPA has no intention of directing State legislatures on how to allocate authority and responsibility under State law. As noted above, there is at least one remedy (the

federal CWA) to control non-storm water discharges through MS4s. If State law prevents political subdivisions from controlling discharges through storm sewers, EPA anticipates common sense will prevail to provide those MS4 operators with the ability to meet the requirements applicable for their discharges.

One comment reinforced the importance of public information and education to the success of this measure. EPA agrees and suggests that MS4 operators consider a variety of ways to inform and educate the public which could include storm drain stenciling; a program to promote, publicize, and facilitate public reporting of illicit connections or discharges; and distribution of visual and/or printed outreach materials. Recycling and other public outreach programs could be developed to address potential sources of illicit discharges, including used motor oil, antifreeze, pesticides, herbicides, and fertilizers.

EPA received comments that State DOT's lack authority to implement this measure. EPA believes that most DOTs can implement most parts of this measure. If a DOT does not have the necessary legal authority to implement any part of this measure, EPA encourages them to coordinate their storm water management efforts with the surrounding MS4s and other State agencies. Many DOTs that are regulated under Phase I of this program are co-permittees with the local regulated MS4. Under today's rule, DOTs can use any of the options of § 122.35 to share their storm water management responsibilities.

EPA received comments requesting clarification of various terms such as "outfall" and "illicit discharge." One comment asked EPA to reinforce the point that a "ditch" could be considered an outfall. The term "outfall" is defined at 40 CFR 122.26(b)(9) as "a point source at the point where a municipal separate storm sewer discharges to waters of the United States * * *". The term municipal separate storm sewer is defined at 40 CFR § 122.26(b)(8) as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) * * *". Following the logic of these definitions, a "ditch" may be part of the municipal separate storm sewer, and at the point where the ditch discharges to waters of the United States, it would be an outfall. As with any determination about jurisdictional provisions of the CWA, however, final decisions require case specific evaluations of fact.

One commenter specifically requested clarification on the relationship between the term "illicit discharge" and non-storm water discharges from fire fighting. The comment suggested that it would be impractical to attempt to determine whether the flow from a specific fire (*i.e.*, during a fire) is a significant source of pollution. EPA intends that MS4s will address all allowable non-storm water flows categorically rather than individually. If an MS4 is concerned that flows from fire fighting are, as a category, contributing substantial amounts of pollutants to their system, they could develop a program to address those flows prospectively. The program may include an analysis of the flow from several sources, steps to minimize the pollutant contribution, and a plan to work with the sources of the discharge to minimize any adverse impact on water quality. During the development of such a program, the MS4 may determine that only certain types of flows within a particular category are a concern, for example, fire fighting flows at industrial sites where large quantities of chemicals are present. In this example, a review of existing procedures with the fire department and/or hazardous materials team may reveal weaknesses or strengths previously unknown to the MS4 operator.

EPA received comments requesting modifications to the rule to include on-site sewage disposal systems (*i.e.*, septic systems) in the scope of the illicit discharge program. On-site sewage disposal systems that flow into storm drainage systems are within the definition of illicit discharge as defined by the regulations. Where they are found to be the source of an illicit discharge, they need to be eliminated similar to any other illicit discharge source. Today's rule was not modified to include discharges from on-site sewage disposal systems specifically because those sources are already within the scope of the existing definition of illicit discharge.

iv. Construction Site Storm Water Runoff Control. Over a short period of time, storm water runoff from construction site activity can contribute more pollutants, including sediment, to a receiving stream than had been deposited over several decades (see section I.B.3). Storm water runoff from construction sites can include pollutants other than sediment, such as phosphorus and nitrogen, pesticides, petroleum derivatives, construction chemicals, and solid wastes that may become mobilized when land surfaces are disturbed. Generally, properly

implemented and enforced construction site ordinances effectively reduce these pollutants. In many areas, however, the effectiveness of ordinances in reducing pollutants is limited due to inadequate enforcement or incomplete compliance with such local ordinances by construction site operators (Paterson, R.G. 1994. "Construction Practices: The Good, the Bad, and the Ugly." *Watershed Protection Techniques* 1(2)).

Today's rule requires operators of regulated small MS4s to develop, implement, and enforce a pollutant control program to reduce pollutants in any storm water runoff from construction activities that result in land disturbance of 1 or more acres (see § 122.34(b)(4)). Construction activity on sites disturbing less than one acre must be included in the program if the construction activity is part of a larger common plan of development or sale that would disturb one acre or more.

The construction runoff control program of the regulated small MS4 must include an ordinance or other regulatory mechanism to require erosion and sediment controls to the extent practicable and allowable under State, Tribal or local law. The program also must include sanctions to ensure compliance (for example, non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance). The program must also include, at a minimum: requirements for construction site operators to implement appropriate erosion and sediment control BMPs, such as silt fences, temporary detention ponds and diversions; procedures for site plan review by the small MS4 which incorporate consideration of potential water quality impacts; requirements to control other waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may adversely impact water quality; procedures for receipt and consideration of information submitted by the public to the MS4; and procedures for site inspection and enforcement of control measures by the small MS4.

Today's rule provides flexibility for regulated small MS4s by allowing them to exclude from their construction pollutant control program runoff from those construction sites for which the NPDES permitting authority has waived NPDES storm water small construction permit requirements. For example, if the NPDES permitting authority waives permit coverage for storm water discharges from construction sites less than 5 acres in areas where the rainfall erosivity factor is less than 5, then the regulated small MS4 does not have to

include these sites in its storm water management program. Even if requirements for a discharge from a given construction site are waived by the NPDES permitting authority, however, the regulated small MS4 may still choose to control those discharges under the MS4's construction pollutant control program, particularly where such discharges may cause siltation problems in storm sewers. See Section II.I.1.b for more information on construction waivers by the permitting authority.

Some commenters suggested that the proposed construction minimum measure requirements went beyond the permit application requirements concerning construction for medium and large MS4s. In response, EPA has made changes to the proposed measure so that it more closely resembles the MS4 permit application requirements in existing regulations. For example, as described below, the Agency revised the proposed requirements for "pre-construction review of site management plans" to require "procedures for site plan review."

One commenter expressed concerns that addressing runoff from construction sites within urbanized areas (through the small MS4 program) differently from construction sites outside urbanized areas (which will not be covered by the small MS4 program) will encourage urban sprawl. Today's rule, together with the existing requirements, requires all construction greater than or equal to 1 acre, unless waived, to be covered by an NPDES permit whether it is located inside or outside of an urbanized area (see § 122.26(b)(15)). Today's rule does not require small MS4s to control runoff from construction sites more stringently or prescriptively than is required for construction site runoff outside urbanized areas. Therefore, today's rule imposes no substantively different onsite controls on runoff of storm water from construction sites in urbanized areas than from construction sites outside of urbanized areas.

One commenter recommended that the small MS4 construction site storm water runoff control program address all storm water runoff from construction sites, not just the runoff into the MS4. The commenter also believed that MS4s should provide clear, objective standards for all construction sites. EPA agrees. Because today's rule only regulates discharges from the MS4, the construction pollutant control measure only requires small MS4 operators to control runoff into its system. As a practical matter, however, EPA anticipates that MS4 operators will find that regulation of all construction site

runoff, whether they runoff into the MS4 or not, will prove to be the most simple and efficient program. The Agency may provide more specific criteria for construction site BMPs in the forthcoming rule being developed under CWA section 402(m). See section II.D.1 of today's rule.

One commenter stated that there is no need for penalties at the local level by the small MS4 because the CWA already imposes sufficient penalties to ensure compliance. EPA disagrees and believes that enforcement and compliance at the local level is both necessary and preferable. Examples of sanctions, some not available under the CWA, include non-monetary penalties, monetary fines, bonding requirements, and denial of future or other local permits.

One commenter recommended that EPA should not include the requirement to control pollutants other than sediment from construction sites in this measure. EPA disagrees with this comment. The requirement is to control waste that "may cause adverse impacts on water quality." Such wastes may include discarded building materials, concrete truck washout, chemicals, pesticides, herbicides, litter, and sanitary waste. These wastes, when exposed to and mobilized by storm water, can contribute to water quality impairment.

The proposed rule required "procedures for pre-construction review of site management plans." EPA requested comment on expanding this provision to require both review and approval of construction site storm water plans. Many commenters expressed the concern that review and approval of site plans is not only costly and time intensive, but may unnecessarily delay construction projects and unduly burden staff who administer the local program. In addition, some commenters expressed confusion whether EPA proposed pre-construction review for all site management plans or only higher priority sites. To address these comments, and be consistent with the permit application requirements for larger MS4s, EPA changed "procedures for pre-construction review of site management plans" to "procedures for site plan review." Today's rule requires the small MS4 to develop procedures for site plan review so as to incorporate consideration of adverse potential water quality impacts. Procedures should include review of site erosion and sediment control plans, preferably before construction activity begins on a site. The objective is for the small MS4 operator and the construction site operator to address storm water runoff

from construction activity early in the project design process so that potential consequences to the aquatic environment can be assessed and adverse water quality impacts can be minimized or eliminated.

One commenter requested that EPA delete the requirement for "procedures for receipt and consideration of information submitted by the public" because it went beyond existing storm water requirements. Another commenter stated that establishing a separate process to respond to public inquiries on a project is a burden to small communities, especially if the project has gone through an environmental review. One commenter requested clarification of this provision. EPA has retained this requirement in today's final rule to require some formality in the process for addressing public inquiries regarding storm water runoff from construction activities. EPA does not intend that small MS4s develop a separate, burdensome process to respond to every public inquiry. A small MS4 could, for example, simply log public complaints on existing storm water runoff problems from construction sites and pass that information on to local inspectors. The inspectors could then investigate complaints based on the severity of the violation and/or priority area.

One commenter believed that the proposed requirement of "regular inspections during construction" would require every construction project to be inspected more than once by the small MS4 during the term of a construction project. EPA has deleted the reference to "regular inspections." Instead, the small MS4 will be required to "develop procedures for site inspection and enforcement of control measures." Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality.

In order to avoid duplication of small MS4 construction requirements with NPDES construction permit requirements, today's rule adds § 122.44(s) to recognize that the NPDES permitting authority can incorporate qualifying State, Tribal, or local erosion and sediment control requirements in NPDES permits for construction site discharges. For example, a construction site operator who complies with MS4 construction pollutant control programs that are referenced in the NPDES construction permit would satisfy the requirements of the NPDES permit. See section II.I.1.d for more information on incorporating qualifying programs by

reference into NPDES construction permits. This provision has no impact on, or direct relation to, the small MS4 operator's responsibilities under the construction site storm water runoff control minimum measure. Conversely, under § 122.35(b), the permitting authority may recognize in the MS4's permit that another governmental entity, or the permitting authority itself, is responsible for implementing one or more of the minimum measures (including construction site storm water runoff control), and not include this measure in the small MS4's permit. In this case, the other governmental entity's program must satisfy all of the requirements of the omitted measure.

v. Post-Construction Storm Water Management in New Development and Redevelopment. The NURP study and more recent investigations indicate that prior planning and designing for the minimization of pollutants in storm water discharges is the most cost-effective approach to storm water quality management. Reducing pollutant concentrations in storm water after the discharge enters a storm sewer system is often more expensive and less efficient than preventing or reducing pollutants at the source. Increased human activity associated with development often results in increased pollutant loading from storm water discharges. If potential adverse water quality impacts are considered from the beginning stages of a project, new development and redevelopment provides more opportunities for water quality protection. For example, minimization of impervious areas, maintenance or restoration of natural infiltration, wetland protection, use of vegetated drainage ways, and use of riparian buffers have been shown to reduce pollutant loadings in storm water runoff from developed areas. EPA encourages operators of regulated small MS4s to identify specific problem areas within their jurisdictions and initiate innovative solutions and designs to focus attention on those areas through local planning.

In today's rule at § 122.34(b)(5), NPDES permits issued to an operator of a regulated small MS4 will require the operator to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that result in land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. Specifically, the NPDES permit will require the operator of a regulated small MS4 to: (1) Develop and implement

strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community; (2) use an ordinance, or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; (3) ensure adequate long-term operation and maintenance of BMPs; and (4) ensure that controls are in place that would minimize water quality impacts. EPA intends the term "redevelopment" to refer to alterations of a property that change the "footprint" of a site or building in such a way that results in the disturbance of equal to or greater than 1 acre of land. The term is not intended to include such activities as exterior remodeling, which would not be expected to cause adverse storm water quality impacts and offer no new opportunity for storm water controls.

EPA received comments requesting guidance and clarification of the rule requirements. The scope of the comments ranged from general requests for more details on how MS4 operators should accomplish the four requirements listed above, to specific requests for information regarding transfer of ownership for structural controls, as well as ongoing responsibility for operation and maintenance. By the term "combination" of BMPs, EPA intends a combination of structural and/or non-structural BMPs. For this requirement, the term "combination" is meant to emphasize that multiple BMPs should be considered and adopted for use in the community. A single BMP generally cannot significantly reduce pollutant loads because pollutants come from many sources within a community. The BMPs chosen should: (1) Be appropriate for the local community; (2) minimize water quality impacts; and (3) attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, EPA encourages small MS4 operators to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders. Each new development and redevelopment project should have a BMP component. If an approach is chosen that primarily focuses on regional or non-structural BMPs, however, then the BMPs may be located away from the actual development site (e.g., a regional water quality pond).

Non-structural BMPs are preventative actions that involve management and source controls such as: (1) Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas

such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; (2) policies or ordinances that encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure; (3) education programs for developers and the public about project designs that minimize water quality impacts; and (4) other measures such as minimization of the percentage of impervious area after development, use of measures to minimize directly connected impervious areas, and source control measures often thought of as good housekeeping, preventive maintenance and spill prevention. Detailed examples of non-structural BMPs follow.

Preserving open space may help to protect water quality as well as provide other benefits such as recharging groundwater supplies, detaining storm water, supporting wildlife and providing recreational opportunities. Although securing funding for open space acquisition may be difficult, various funding mechanisms have been used. New Jersey uses a portion of their State sales tax (voter approved for a ten year period) as a stable source of funding to finance the preservation of historic sites, open space and farmland. Colorado uses part of the proceeds from the State lottery to acquire and manage open space. Some local municipalities use a percentage of the local sales tax revenue to pay for open space acquisition (e.g., Jefferson County, CO has had an open space program in place since 1977 funded by a 0.50 percent sales tax). Open space can be acquired in the form of: fee simple purchase; easements; development rights; purchase and sellback or leaseback arrangements; purchase options; private land trusts; impact fees; and land dedication requirements. Generally, fee simple purchases provide the highest level of development control and certainty of preservation, whereas the other forms of acquisition may provide less control, though they would also generally be less costly.

Cluster development, while allowing housing densities comparable to conventional zoning practice, concentrates housing units in a portion of the total site area which provides for greater open space, recreation, stream protection and storm water control. This type of development, by reducing lot sizes, can protect sensitive areas and result in less impervious surface, as well

as reduce the cost for roads and other infrastructure.

Minimizing directly connected impervious areas (DCIAs) is a drainage strategy that seeks to reduce paved areas and directs storm water runoff to landscaped areas or to structural controls such as grass swales or buffer strips. This strategy can slow the rate of runoff, reduce runoff volumes, attenuate peak flows, and encourage filtering and infiltration of storm water. It can be made an integral part of drainage planning for any development (Urban Drainage and Flood Control District, Denver, CO. 1992. *Urban Storm Drainage Criteria Manual, Volume 3—Best Management Practices*). The Urban Drainage and Flood Control District manual describes three levels for minimizing DCIAs. At Level 1 all impervious surfaces are made to drain over grass-covered areas before reaching a storm water conveyance system. Level 2 adds to Level 1 and replaces street curb and gutter systems with low-velocity grass-lined swales and pervious street shoulders. In addition to Levels 1 and 2, Level 3 over-sizes swales and configures driveway and street crossing culverts to use grass-lined swales as elongated detention basins.

Structural BMPs include: (1) Storage practices such as wet ponds and extended-detention outlet structures; (2) filtration practices such as grassed swales, sand filters and filter strips; and (3) infiltration practices such as infiltration basins and infiltration trenches.

EPA recommends that small MS4 operators ensure the appropriate implementation of the structural BMPs by considering some or all of the following: (1) Pre-construction review of BMP designs; (2) inspections during construction to verify BMPs are built as designed; (3) post-construction inspection and maintenance of BMPs; and (4) sanctions to ensure compliance with design, construction or operation and maintenance (O&M) requirements of the program.

EPA cautions that certain infiltration systems such as dry wells, bored wells or tile drainage fields may be subject to Underground Injection Control (UIC) program requirements (see 40 CFR Part 144.12.). To find out more about these requirements, contact your state UIC Program, or call EPA's Safe Drinking Water Hotline at 1-800-426-4791.

In order to meet the third post-construction requirement (ensuring adequate long-term O&M of BMPs), EPA recommends that small MS4 operators evaluate various O&M management agreement options. The most common options are agreements between the

MS4 operator and another party such as post-development landowners (e.g., homeowners' associations, office park owners, other government departments or entities), or regional authorities (e.g., flood control districts, councils of government). These agreements typically require the post-construction property owner to be responsible for the O&M and may include conditions which: allow the MS4 operator to be reimbursed for O&M performed by the MS4 operator that is the responsibility of the property owner but is not performed; allow the MS4 operator to enter the property for inspection purposes; and in some cases specify that the property owner submit periodic reports.

In providing the guidance above, EPA intends the requirements in today's rule to be consistent with the permit application requirements for large MS4s for post-construction controls for new development and redevelopment. MS4 operators have significant flexibility both to develop this measure as appropriate to address local concerns, and to apply new control technologies as they become available. Storm water pollution control technologies are constantly being improved. EPA recommends that MS4s be responsive to these changes, developments or improvements in control technologies. EPA will provide more detailed guidance addressing the responsibility for long-term O&M of storm water controls in guidance materials. The guidance will also provide information on appropriate planning considerations, structural controls and non-structural controls. EPA also intends to develop a broad menu of BMPs as guidance to ensure flexibility to accommodate local conditions.

EPA received comments suggesting that requirements for new development be treated separately from redevelopment in the rule. The comment stressed that new development on raw land presents fewer obstacles and more opportunities to incorporate elements for preventing water quality impacts, whereas redevelopment projects are constrained by space limitations and existing infrastructure. Another comment suggested allowing waivers from the redevelopment requirements if the redevelopment does not result in additional adverse water quality impacts, and where BMPs are not technologically or economically feasible. EPA recognizes that redevelopment projects may have more site constraints which narrow the range of appropriate BMPs. Today's rule provides small MS4 operators with the

flexibility to develop requirements that may be different for redevelopment projects, and may also include allowances for alternate or off-site BMPs at certain redevelopment projects. Non-structural BMPs may be the most appropriate approach for smaller redevelopment projects.

EPA received comments requesting clarification on what is meant by "pre-development" conditions within the context of redevelopment. Pre-development refers to runoff conditions that exist onsite immediately before the planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred.

EPA received comments on the guidance language in the proposed rule and preamble which suggest that implementation of this measure should "attempt to maintain pre-development runoff conditions" and that "post-development conditions should not be different than pre-development conditions in a way that adversely affects water quality." Many comments expressed concern that maintaining pre-development runoff conditions is impossible and cost-prohibitive, and objected to any reference to "flow" or increase in volume of runoff. Other comments support the inclusion of this language in the final rule. Similar references in today's rule relating to pre-development runoff conditions are intended as *recommendations to attempt to maintain pre-development runoff conditions*. With these recommendations, EPA intends to prevent water quality impacts resulting from increased discharges of pollutants, which may result from increased volume of runoff. In many cases, consideration of the increased flow rate, velocity and energy of storm water discharges following development unavoidably must be taken into consideration in order to reduce the discharge of pollutants, to meet water quality standards and to prevent degradation of receiving streams. EPA recommends that municipalities consider these factors when developing their post-construction storm water management program.

Some comments said that the quoted phrases in the paragraph above are directives that imply federal land use control, which they argue is beyond the authority of the CWA. EPA recognizes that land use planning is within the authority of local governments.

EPA disagrees, however, with the implication that today's rule dictates any such land use decisions. The requirement for small MS4 operators to

develop a program to address discharges resulting from new development and redevelopment is essentially a pollution prevention measure. The Rule provides the MS4 operator with flexibility to determine the appropriate BMPs to address local water quality concerns. EPA recognizes that these program goals may not be applied to every site, and expects that MS4s will develop an appropriate combination of BMPs to be applied on a site-by-site, regional or watershed basis.

vi. Pollution Prevention/Good Housekeeping for Municipal Operations. Under today's final rule, operators of MS4s must develop and implement an operation and maintenance program ("program") that includes a training component and has the ultimate goal of preventing or reducing storm water from municipal operations (in addition to those that constitute storm water discharges associated with industrial activity). This measure's emphasis on proper O&M of MS4s and employee training, as opposed to requiring the MS4 to undertake major new activities, is meant to ensure that municipal activities are performed in the most efficient way to minimize contamination of storm water discharges.

The program must include government employee training that addresses prevention measures pertaining to municipal operations such as: parks, golf courses and open space maintenance; fleet maintenance; new construction or land disturbance; building oversight; planning; and storm water system maintenance. The program can use existing storm water pollution prevention training materials provided by the State, Tribe, EPA, or environmental, public interest, or trade organizations.

EPA also encourages operators of MS4s to consider the following in developing a program: (1) Implement maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from the separate storm sewers; (2) implement controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, waste transfer stations, fleet or maintenance shops with outdoor storage areas, and salt/sand storage locations and snow disposal areas operated by the MS4; (3) adopt procedures for the proper disposal of waste removed from the separate storm sewer systems and areas listed above in (2), including dredge

spoil, accumulated sediments, floatables, and other debris; and (4) adopt procedures to ensure that new flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practices. Ultimately, the effective performance of the program measure depends on the proper maintenance of the BMPs, both structural and non-structural. Without proper maintenance, BMP performance declines significantly over time. Additionally, BMP neglect may produce health and safety threats, such as structural failure leading to flooding, undesirable animal and insect breeding, and odors. Maintenance of structural BMPs could include: replacing upper levels of gravel; dredging of detention ponds; and repairing of retention basin outlet structure integrity. Maintenance of non-structural BMPs could include updating educational materials periodically.

EPA emphasizes that programs should identify and incorporate existing storm water practices and training, as well as non-storm water practices or programs that have storm water pollution prevention benefits, as a means to avoid duplication of efforts and reduce overall costs. EPA recommends that MS4s incorporate these new obligations into their existing programs to the greatest extent feasible and urges States to evaluate MS4 programs with programmatic efficiency in mind. EPA designed this minimum control measure as a modified version of the permit application requirements for medium and large MS4s described at 40 CFR 122.26(d)(2)(iv), in order to provide more flexibility for these smaller MS4s. Today's requirements provide for a consistent approach to control pollutants from O&M among medium, large, and regulated small MS4s.

By properly implementing a program, operators of MS4s serve as a model for the rest of the regulated community. Furthermore, the establishment of a long-term program could result in cost savings by minimizing possible damage to the system from floatables and other debris and, consequently, reducing the need for repairs.

EPA received comments requesting clarification of what this measure requires. Certain municipalities expressed concern that the measure has the potential to impose significant costs associated with EPA's requirement that operators of MS4s consider implementing controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, and salt/sand storage

locations and snow disposal areas operated by the municipality. EPA disagrees that a requirement to *consider* such controls will impose considerable costs.

One commenter objected to the preamble language from the proposal suggesting that EPA does not expect the MS4 to undertake new activity. While it remains the Agency's expectation that major new activity will not be required, the MEP process should drive MS4s to incorporate the measure's obligations into their existing programs to achieve the pollutant reductions to the maximum extent practicable.

Certain commenters requested a definition for "municipal operations." EPA has revised the language to more clearly define municipal operations. Questions may remain concerning whether discharges from specific municipal activities constitute discharges associated with industrial activities (requiring NPDES permit authorization according to the requirements for industrial storm water that apply in that State) or from municipal operations (subject only to the controls developed in the MS4 control program). Even though there may be different substantive requirements that apply depending on the source of the discharge, EPA has modified the deadlines for permit coverage so that all the regulated municipally owned and operated sources become subject to permit requirements on the same date. The deadline is the same for permit coverage for this minimum measure as for permit coverage for municipally owned/operated industrial sources.

c. Application Requirements

An NPDES permit that authorizes the discharge from a regulated small MS4 may take the form of either an individual permit issued to one or more facilities as co-permittees or a general permit that applies to a group of MS4s. For reasons of administrative efficiency and to reduce the paperwork burden on permittees, EPA expects that most discharges from regulated small MS4s will be authorized under general permits. These NPDES general permits will provide specific instructions on how to obtain coverage, including application requirements. Typically, such application requirements will be satisfied by the submission of a Notice of Intent (NOI) to be covered by the general permit. In this section, EPA explains the small MS4 operator's application requirements for obtaining coverage under a NPDES permit for storm water.

i. Best Management Practices and Measurable Goals, Section 122.34(d) of today's rule requires the operator of a regulated small MS4 that wishes to implement a program under § 122.34 to identify and submit to the NPDES permitting authority a list of the best management practices ("BMPs") that will be implemented for each minimum control measure in their storm water management program. They also must submit measurable goals for the development and implementation of each BMP. The BMPs and the measurable goals must be included either in an NOI to be covered under a general permit or in an individual permit application.

The operator's submission must identify, as appropriate, the months and years in which the operator will undertake actions required to implement each of the minimum control measures, including interim milestones and the frequency of periodic actions. The Agency revised references to "starting and completing" actions from the proposed rule because many actions will be repetitive or ongoing. The submission also must identify the person or persons responsible for implementing or coordinating the small MS4 storm water program. See § 122.34(d). The submitted BMPs and measurable goals become enforceable according to the terms of the permit. The first permit can allow the permittee up to five years to fully implement the storm water management program.

Several commenters opposed making the measurable goals enforceable permit conditions. Some suggested that a permittee should be able to change its goals so that BMPs that are not functioning as intended can be replaced. EPA agrees that a permittee should be free to switch its BMPs and corresponding goals to others that accomplish the minimum measure or measures. The permittee is required to implement BMPs that address the minimum measures in § 122.34(b). If the permittee determines that its original combination of BMPs are not adequate to achieve the objectives of the municipal program, the MS4 should revise its program to implement BMPs that are adequate and submit to the permitting authority a revised list of BMPs and measurable goals. EPA suggests that permits describe the process for revising BMPs and measurable goals, such as whether the permittee should follow the same procedures as were required for the submission of the original NOI and whether the permitting authority's approval is necessary prior to the permittee implementing the revised

BMPs. The permittee should indicate on its periodic report whether any BMPs and measurable goals have been revised since the last periodic report.

Some commenters expressed concern that making the measurable goals enforceable would encourage the development of easily attained goals and, conversely, discourage the setting of ambitious goals. Others noted that it is often difficult to determine the pollutant reduction that can be achieved by BMPs until several years after implementation. Much of the opposition to the enforceability of measurable goals appears to have been based on a mistaken understanding that measurable goals must consist of pollutant reduction targets to be achieved by the corresponding BMPs.

Today's rule requires the operator to submit either measurable goals that serve as BMP design objectives or goals that quantify the progress of implementation of the actions or performance of the permittee's BMPs. At a minimum, the required measurable goals should describe specific actions taken by the permittee to implement each BMP and the frequency and the dates for such actions. Although the operator may choose to do so, it is not required to submit goals that measure whether a BMP or combination of BMPs is effective in achieving a specific result in terms of storm water discharge quality. For example, a measurable goal might involve a commitment to inspect a given number of drainage areas of the collection system for illicit connections by a certain date. The measurable goal need not commit to achieving a specific amount of pollutant reduction through the elimination of illicit connections. Other measurable goals could include the date by which public education materials would be developed, a certain percentage of the community participating in a clean-up campaign, the development of a mechanism to address construction site runoff, and a reduction in the percentage of imperviousness associated with new development projects.

To reduce the risk that permittees will develop inadequate BMPs, EPA intends to develop a menu of BMPs to assist the operators of regulated small MS4s with the development of municipal programs. States may also develop a menu of BMPs. Today's rule provides that the measurable goals that demonstrate compliance with the minimum control measures in §§ 122.34(b)(3) through (b)(6) do not have to be met if the State or EPA has not issued a menu of BMPs at the time the MS4 submits its NOI. Commenters pointed out that the proposed rule would have

made the measurable goals unenforceable if the menu of BMPs was not available, but the proposal was silent as to the enforceability of the implementation of BMPs. Today's rule clarifies that the operators are not free to do nothing prior to the issuance of a menu of BMPs; they still must make a good faith effort to implement the BMPs designed to comply with each measure. See § 122.34(d)(2). The operators would not, however, be liable for failure to meet its measurable goals if a menu of BMPs was not available at the time they submit their NOI.

The proposed rule provision in § 123.35 stated that the "[f]ailure to issue the menu of BMPs would not affect the legal status of the general permit." This concept is included in the final rule in § 122.34(d)(2)'s clarification that the permittee still must comply with other requirements of the general permit.

Unlike the proposed rule, today's rule does not require that each BMP in the menu developed by the State or EPA be regionally appropriate, cost-effective and field-tested. Various commenters criticized those criteria as unworkable, and one described them as "ripe for ambiguity and abuse." Other commenters feared that the operators of regulated small MS4s would never be required to achieve their goals until menus were developed that were cost-effective, field-tested and appropriate for every conceivable subregion.

While some municipal commenters supported the requirement that a menu of BMPs be made available that included BMPs that had been determined to be regionally appropriate, field-tested and cost-effective, others raised concerns that they would be restricted to a limited menu. Some commenters supported such a detailed menu because they thought they would only be able to select BMPs that were on the menu, while others thought that it was the permitting authority's responsibility to develop BMPs narrowly tailored to their situation. In response, EPA notes that the operators will not be restricted to implementing only, or all of, the BMPs included on the menu. Since the menu does not require permittees to implement the BMPs included on the menu, it is also not necessary to apply the public notice and other procedures that some commenters thought should be applied to the development of the menu of BMPs.

The purpose of the BMP menu is to provide guidance to assist the operators of regulated small MS4s with the development and refinement of their local program, not to limit their options. Permittees may implement BMPs other

than those on the menu unless a State restricts its permittees to specific BMPs. To the extent possible, EPA will develop a menu of BMPs that describes the appropriateness of BMPs to specific regions, whether the BMPs have been field-tested, and their approximate costs. The menu, however, is not intended to relieve permittees of the need to implement BMPs that are appropriate for their specific circumstances.

If there are no known relevant BMPs for a specific circumstance, a permittee has the option of developing and implementing pilot BMPs that may be better suited to their circumstances. Where BMPs are experimental, the permittee should consider committing to measurable goals that address its schedule for implementing its selected BMPs rather than goals of achieving specific pollutant reductions. If the BMPs implemented by the permittee do not achieve the desired objective, the permittee may be required to commit to different or revised BMPs.

As stated in § 123.35(g), EPA is committed to issuing a menu of BMPs prior to the deadline for the issuance of permits. This menu would serve as guidance for all operators of regulated small MS4s nationwide. After developing the initial menu of BMPs, EPA intends to periodically modify, update, and supplement the menu of BMPs based on the assessments of the MS4 storm water program and research. States may rely on EPA's menu of BMPs or issue their own. If States develop their own menus, they would constitute additional guidance (or perhaps requirements in some States) for the operators to follow. Several commenters were confused by the proposed rule language that stated that States must provide or issue a menu of BMPs and, if they fail to do so, EPA "may" do so. Some read this language as not requiring either EPA or the State to develop the menu. EPA had intended that it would develop a menu and that States could either provide the EPA developed menu or one developed by the State.

EPA has dropped the proposed language that States "must" develop the menu of BMPs. Some commenters thought that it was inappropriate to require States to issue guidance. A menu of BMPs issued by either EPA or a permittee's State will satisfy the condition in § 122.34(d) that a regulatory authority provide a menu of BMPs. A State could require its permittees to follow its menu of BMPs provided that they are adequate to implement § 122.34(b).

Several commenters raised concerns that operators of small MS4s could be

required to submit their BMPs and measurable goals before EPA or the State has issued a menu of BMPs. EPA has assumed primary responsibility for developing a menu of BMPs to minimize the possibility of this occurring. Should a general permit be issued before a menu of BMPs is available, the permit writer would have the option of delaying the date by which the identification of the BMPs and measurable goals must be submitted to the permitting authority until some time after a menu of BMPs is available.

Several municipal commenters raised concerns that they would begin to develop a program only to be later told by the permitting authority or challenged in a citizen suit that their BMPs were inadequate. They expressed a need for certainty regarding what their permit required. Several commenters suggested that EPA require permitting authorities to approve or disapprove the submitted BMPs and measurable goals. EPA disagrees that formal approval or disapproval by the permitting authority is needed.

EPA acknowledges that the lack of a formal approval process does place on the permittee some responsibility for designing and determining the adequacy of its BMPs. Once the permittee has submitted its BMPs to the permitting authority as part of its NOI, it must implement them in order to achieve the corresponding measurable goals. EPA does not believe that this results in the uncertainty to the extent expressed by some commenters or unduly expose the permittee to the risk of citizen suit. If the permit is very specific regarding what the permittee must do, then the uncertainty is eliminated. If the permit is less prescriptive, the permittee has greater latitude in determining for itself what constitutes an adequate program. A citizen suit could impose liability on the permittee only if the program that it develops and implements clearly does not satisfy the requirements of the general permit. EPA believes today's approach strikes a balance between the competing goals of providing certainty as to what constitutes an adequate program and providing flexibility to the permittees.

Commenters were divided on whether five years was a reasonable and expeditious schedule for a MS4 to implement its program. Some thought that it was an appropriate amount of time to allow for the development and implementation of adequate programs. One questioned whether the permittee had to be implementing all of its program within that time, and suggested that there may be cases where a permitting authority would need

flexibility to allow more time. One commenter suggested that five years is too long and would amount to a relaxation of implementation in their area. EPA believes it will take considerable time to complete the tasks of initially developing a program, commencing to implement it, and achieving results. EPA notes, however, that full implementation of an appropriate program must occur as expeditiously as possible, and not later than five years.

EPA solicited comment on how an NOI form might best be formatted to allow for measurable goal information (e.g., through the use of check boxes or narrative descriptions) while taking into account the Agency's intention to facilitate computer tracking. All commenters supported the development of a checklist NOI, but most noted that there would need to be room for additional information to cover unusual situations. One noted that, while a summary of measurable goals might be reduced to one sheet, attachments that more fully described the program and the planned BMPs would be necessary. EPA agrees that in most cases a "checklist" will not be able to capture the information on what BMPs a permittee intends to implement and its measurable goals for their implementation. EPA will continue to consider whether to develop a model NOI form and make it available for permitting authorities that choose to use it. What will be required on an MS4's NOI, however, is more extensive than what is usually required on an NOI, so a "form" NOI for MS4s may be impractical.

ii. Individual Permit Application for a § 122.34(b) program. In some cases, an operator of a regulated small MS4s may seek coverage under an individual NPDES permit, either because it chooses to do so or because the NPDES permitting authority has not made the general permit option available to that source. For small MS4s that are to implement a § 122.34(b) program in today's rule, EPA is promulgating simplified individual permit application requirements at § 122.33(b)(2)(i). Under the simplified individual permit application requirements, the operator submits an application to the NPDES permitting authority that includes the information required under § 122.21(f) and an estimate of square mileage served by the small MS4. They are also required to supply the BMP and measurable goal information required under § 122.34(d). Consistent with CWA section 308 and analogous State law, the permitting authority could request any additional information to gain a better

understanding of the system and the areas draining into the system.

Commenters suggested that the requirements of § 122.21(f) are not necessarily applicable to a small MS4. One suggested that it was not appropriate to require the following information: a description of the activities conducted by the applicant which require it to obtain an NPDES permit; the name, mailing address, and location of the facility; and up to four Standard Industrial Classification ("SIC") codes which best reflect the principal products or services provided by the facility. In response, EPA notes that the requirements in § 122.21(f) are generic application requirements applicable to NPDES applicants. With the exception of the SIC code requirement, EPA believes that they are applicable to MS4s. In the SIC code portion of the standard application, the applicant may simply put "not applicable."

One commenter asked that EPA clarify whether § 122.21(f)(5)'s requirement to indicate "whether the facility is located on Indian lands," referred to tribal lands, Indian country, or Indian reservations. For some local governments this is a complex issue with no easy "yes" or "no" answer. See the discussion in the Section II.F in the proposal to today's rule regarding what tribal lands are subject to the federal trust responsibility for purposes of the NPDES program.

One commenter suggested that the application should not have to list the permits and approvals required under § 122.21(f)(6). EPA notes that the applicant must only list the environmental permits that the applicant has received that cover the small MS4. The applicant is not required to list permits for other operations conducted by the small MS4 operator (e.g., for an operation of an airport or landfill). Again, in most cases the applicant could respond "not applicable" to this portion of the application.

One commenter suggested that the topographic map requirement of § 122.21(f)(7) was completely different from, and significantly more onerous than, the mapping requirement outlined in the proposed rule at § 122.34(b)(3)(i). EPA agrees and has modified the final rule to clarify that a map that satisfies the requirements of § 122.34(b)(3)(i) also satisfies the map requirements for MS4 applicants seeking individual permits under § 122.33(b)(2)(i).

EPA is adding a new paragraph to § 122.44(k) to clarify that requirements to implement BMPs developed pursuant to CWA 402(p) are appropriate permit

conditions. While such conditions could be included under the existing provision in § 122.44(k)(3) for “practices reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA,” EPA believes it is clearer to specifically list in § 122.44(k) BMPs that implement storm water programs in light of the frequency with which they are used as effluent limitations.

iii. Alternative Permit Options/Tenth Amendment. As an alternative to implementing a program that addresses each of the six minimum measures according to the requirements of § 122.34(b), today’s rule provides the operators of regulated small MS4s with the option of applying for an individual permit under existing § 122.26(d). See § 122.33(b)(2)(ii). If a system operator does not want to be held accountable for implementation of each of the minimum measures, an individual permit option under § 122.33(b)(2)(ii) remains available. (As explained in the next section of this preamble, § 122.35(b) also provides an opportunity for relief from permit obligations for some of the minimum measures, but that relief exists within the framework of the minimum measures.)

EPA originally drafted the individual permit application requirements in § 122.26(d) to apply to medium and large MS4s. Today’s rule abbreviates the individual permit application requirements for small MS4s. Although EPA believes that the storm water management program requirements of § 122.34, including the minimum measures, provide the most appropriate means to control pollutants from most small MS4s, the Agency does recognize that the operators of some small MS4s may prefer more individualized permit requirements. Among other possible reasons, an operator may seek to avoid having to “regulate” third parties discharging into the separate storm sewer system. Alternatively, an operator may determine that structural controls, such as constructed wetlands, are more appropriate or effective to address the discharges that would otherwise be addressed under the construction and/or development/redevelopment measures.

Some MS4s commenters alleged that an absolute requirement to implement the minimum measures violates the Tenth Amendment to the U.S. Constitution. While EPA disagrees that requiring MS4s to implement the minimum measures would violate the Constitution, today’s rule does provide small MS4s with the option of developing more individualized measures to reduce the pollutants and

pollution associated with urban storm water that will be regulated under today’s rule.

Some commenters specifically objected that § 122.34’s minimum measures for small MS4s violate the Tenth Amendment insofar as they require the operators of MS4s to regulate third parties. The minimum measures include requirements for small MS4 operators to prohibit certain non-storm water discharges, control storm water discharges from construction greater than one acre, and take other actions to control third party sources of storm water discharges into their MS4s. Commenters also argued that it was inappropriate for EPA to require local governments to enact ordinances that will consume local revenues and put local governments in the position of bearing the political responsibility for implementing the program. One commenter argued that EPA was prohibited from conditioning the issuance of an NPDES permit upon the small MS4 operators waiving their constitutional right to be free from such requirements to regulate third parties. The Agency replies to each comment in turn.

Because the rule does rely on local governments—who operate municipal separate storm sewer systems—to regulate discharges from third parties into storm sewers, EPA acknowledges that the rule implicates the Tenth Amendment and constitutional principles of federalism. EPA disagrees, however, that today’s rule is inconsistent with federalism principles. [As political subdivisions of States, municipalities enjoy the same protections as States under the Tenth Amendment.]

The Supreme Court has interpreted the Tenth Amendment to preclude federal actions that compel States or their political subdivisions to enact or administer a federal regulatory program. See *New York v. United States*, 505 U.S. 144 (1992); *Printz v. United States*, 117 S.Ct. 2365 (1997). The *Printz* case, however, did acknowledge that the restriction does not apply when federal requirements of general applicability—requirements that regulate all parties engaging in a particular activity—do not excessively interfere with the functioning of State governments when those requirements are applied to States (or their political subdivisions). See *Printz*, 117 S.Ct. at 2383.

Today’s rule imposes a federal requirement of general applicability, namely, the requirement to obtain and comply with an NPDES permit, on municipalities that operate a municipal separate storm sewer system. By virtue

of this rule, the permit will require the municipality/storm sewer operator to develop a storm water control program. The rule specifies the components of the control program, which are primarily “management”-type controls, for example, municipal regulation of third party storm water discharges associated with construction, as well as development and redevelopment, when those discharges would enter the municipal system.

Unlike the circumstances reviewed in the *New York* and *Printz* cases, today’s rule merely applies a generally applicable requirement (the CWA permit requirement) to municipal point sources. The CWA establishes a generally applicable requirement to obtain an NPDES permit to authorize point source discharge to waters of the United States. Because municipalities own and operate separate storm sewers, including storm sewers into which third parties may discharge pollutants, NPDES permits may require municipalities to control the discharge of pollutants into the storm sewers in the first instance. Because NPDES permits can impose end-of-pipe numeric effluent limits, narrative effluent limits in the form of “management” program requirements are also within the scope of Clean Water Act authority. As noted above, however, EPA believes that such narrative limitations are the most appropriate form of effluent limitation for these types of permits. For municipal separate storm sewer permits, CWA section 402(p)(3)(B)(iii) specifically authorizes “controls to reduce pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.”

The Agency did not design the minimum measures in § 122.34 to “commandeer” state regulatory mechanisms, but rather to reduce pollutant discharges from small MS4s. The permit requirement in CWA section 402 is a requirement of general applicability. The operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts “title” for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties. Section 122.34 requires the operator of a regulated small MS4 to control a third

party only to the extent that the MS4 collection system receives pollutants from that third party and discharges it to the waters of the United States. The operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties. The Agency concedes that administration of a municipal program will consume limited local revenues for implementation; but those consequences stem from the municipal operator's identity as a permitted sewer system operator. The Tenth Amendment does not create a blanket municipal immunity from generally applicable requirements. Development of a program based on the minimum measures and implementation of that program should not "excessively interfere" with the functioning of municipal government, especially given the "practicability" threshold under CWA section 402(p)(3)(B)(iii).

As noted above, today's rule also allows regulated small MS4s to opt out of the minimum measures approach. The individual permit option provides for greater flexibility in program implementation and also responds to the comment about requiring a municipal permit applicant's waiver of any arguable constitutional rights. The individual permit option responds to questions about the rule's alleged unconstitutionality by more specifically focusing on the pollutants discharged from municipal point sources. Today's rule gives operators of MS4s the option to seek an individual permit that varies from the minimum measures/management approach that is otherwise specified in today's rule. Even if the minimum measures approach was constitutionally suspect, a requirement that standing alone would violate constitutional principles of federalism does not raise concerns if the entity subject to the requirement may opt for an alternative action that does not raise a federalism issue.

For municipal system operators who seek to avoid third party regulation according to all or some of the minimum measures, § 122.26(d) requires the operator to submit a narrative description of its storm water sewer system and any existing storm water control program, as well as the monitoring data to enable the permit writer to develop appropriate permit conditions. The permit writer can then develop permit conditions and limitations that vary from the six minimum measures prescribed in today's rule. The information will enable the permit writer to develop an NPDES permit that will result in pollutant reduction to the maximum

extent practicable. See *NRDC v. EPA*, 966 F.2d at 1308, n17. If determined appropriate under CWA section 402(p)(3)(B)(iii), for example BMPs to meet water quality standards, the permit could also incorporate any more stringent or prescriptive effluent limits based on the individual permit application information.

For small MS4 operators seeking an individual permit, both Part 1 and Part 2 of the application requirements in § 122.26(d)(1) and (2) are required to be submitted within 3 years and 90 days of the date of publication of this **Federal Register** notice. Some of the information required in Part 1 will necessarily have to be developed by the permit applicant prior to the development of Part 2 of the application. The permit applicant should coordinate with its permitting authority regarding the timing of review of the information.

The operators of regulated small MS4s that apply under § 122.26(d) may apply to implement certain of the § 122.34(b) minimum control measures, and thereby focus the necessary evaluation for additional limitations on alternative controls to the § 122.34(b) measures that the small MS4 will not implement. The permit writer may determine "equivalency" for some or all of the minimum measures by developing a rough estimate of the pollutant reduction that would be achieved if the MS4 implemented the § 122.34 minimum measure and to incorporate that pollutant reduction estimate in the small MS4's individual permit as an effluent limitation. The Agency recognizes that, based on current information, any such estimates will probably have a wide range. Anticipation of this wide range is one of the reasons EPA believes MS4 operators need flexibility in determining the mix of BMPs (under the minimum measures) to achieve water quality objectives. Therefore, for example, if a system operator seeks to employ an alternative that involves structural controls, wide ranges will probably be associated with gross pollutant reduction estimates. Permit writers will undoubtedly develop other ways to ensure that permit limits ensure reduction of pollutants to the maximum extent practicable.

Small MS4 operators that pursue this individual permit option do not need to submit details about their future program requirements (e.g., the MS4's future plans to obtain legal authority required by §§ 122.26(d)(1)(ii) and (d)(2)). A small MS4 operator might elect to supply such information if it intends for the permit writer to take those plans into account when

developing the small MS4's permit conditions.

Several operators of small MS4s commented that they currently lacked the authority they would need to implement one or more of the minimum measures in § 122.34(b). Today's rule recognizes that the operators of some small MS4s might not have the authority under State law to implement one or more of the measures using, for example, an ordinance or other regulatory mechanism. To address these situations, each minimum measure in § 122.34(b) that would require the small MS4 operator to develop an ordinance or other regulatory mechanism states that the operator is only required to implement that requirement to "the extent allowable under State, Tribal or local law." See § 122.34(b)(3)(ii) (illicit discharge elimination), § 122.34(b)(4)(ii) (construction runoff control) and § 122.34(b)(5)(ii) (post-construction storm water management). This regulatory language does not mean that a operator of a small MS4 with ordinance making authority can simply fail to pass an ordinance necessary for a § 122.34(b) program. The reference to "the extent allowable under * * * local law" refers to the local laws of *other* political subdivisions to which the MS4 operator is subject. Rather, a small MS4 operator that seeks to implement a program under section § 122.34(b) may omit a requirement to develop an ordinance or other regulatory mechanism only to the extent its municipal charter, State constitution or other legal authority prevents the operator from exercising the necessary authority. Where the operator cannot obtain the authority to implement any activity that is only required to "the extent allowable under State, Tribal or local law," the operator may satisfy today's rule by administering the remaining § 122.34(b) requirements.

Finally, although today's rule provides operators of small MS4s with an option of applying for a permit under § 122.26(d), States authorized to administer the NPDES program are not required to provide this option. NPDES-authorized States could require all regulated small MS4s to be permitted under the minimum measures management approach in § 122.34 as a matter of State law. Such an approach would be deemed to be equally or more stringent than what is required by today's rule. See 40 CFR 123.2(i). The federalism concerns discussed above do not apply to requirements imposed by a State on its political subdivisions.

iv. Satisfaction of Minimum Measure Obligations by Another Entity. An operator of a regulated small MS4 may

satisfy the requirement to implement one or more of the six minimum measures in § 122.34(b) by having a third party implement the measure or measures. Today's rule provides a variety of means for small MS4 operators to share responsibility for different aspects of their storm water management program. The means by which the operators of various MS4s share responsibility may affect who is ultimately responsible for performance of the minimum measure and who files the periodic reports on the implementation of the minimum measure. Section 122.35 addresses these issues. The rule describes two different variants on third party implementation with different consequences if the third party fails to implement the measure.

If the permit covering the discharge from a regulated small MS4 identifies the operator as the entity responsible for a particular minimum control measure, then the operator-permittee remains responsible for the implementation of that measure even if another entity has agreed to implement the control measure. Section 122.35(a). Another party may satisfy the operator-permittee's responsibility by implementing the minimum control measure in a manner at least as stringent or prescriptive as the corresponding NPDES permit requirement. If the third party fails to do so, the operator-permittee remains responsible for its performance. The operator of the MS4 should consider entering into an agreement with the third party that acknowledges the responsibility to implement the minimum measure. The operator-permittee's NOI and its annual § 122.34(f)(3) reports submitted to the NPDES permitting authority must identify the third party that is satisfying one or more of the permit obligations. This requirement ensures that the permitting authority is aware which entity is supposed to implement which minimum measures.

If, on the other hand, the regulated small MS4's permit recognizes that an NPDES permittee other than the operator-permittee is responsible for a particular minimum control measure, then the operator-permittee is relieved from the responsibility for implementing that measure. The operator-permittee is also relieved from the responsibility for implementing any measure that the operator's permit indicates will be performed by the NPDES permitting authority. Section 122.35(b). The MS4 operator-permittee would be responsible for implementing the remaining minimum measures.

Today's final rule differs from the proposed version of § 122.35(b), which

stated that, even if the third party's responsibility is recognized in the permit, the MS4 operator-permittee remained responsible for performance if the third party failed to perform the measure consistent with § 122.34(b). Under today's rule, the operator-permittee is relieved from responsibility for performance of a measure if the third party is an NPDES permittee whose permit makes it responsible for performance of the measure (including, for example, a State agency other than the State agency that issues NPDES permits) or if the third party is the NPDES permitting authority itself. Because the permitting authority is acknowledging the third party's responsibility in the permit, commenters thought that the MS4 operator-permittee should not be responsible for ensuring that the other entity is implementing the control measure properly. EPA agrees that the operator-permittee should not be conditionally responsible when the requirements are enforceable against some other NPDES permittee. If the third party fails to perform the minimum measure, the requirements will be enforceable against the third party. In addition, the NPDES permitting authority could reopen the operator-permittee's permit under § 122.62 and modify the permit to make the operator responsible for implementing the measure. A new paragraph has been added to § 122.62 to clarify that the permit may be reopened in such circumstances.

Today's rule also provides that the operator-permittee is not conditionally responsible where it is the State NPDES permitting authority itself that fails to implement the measure. The permitting authority does not need to issue a permit to itself (i.e., to the same State agency that issues the permit) for the sole purpose of relieving the small MS4 from responsibility in the event the State agency does not satisfy its obligation to implement a measure. EPA does not believe that the small MS4 should be responsible in the situation where the NPDES permit issued to the small MS4 operator recognizes that the State agency that issues the permit is responsible for implementing a measure. If the State does fail to implement the measure, the State agency could be held accountable for its commitment in the permit to implement the measure. Where the State does not fulfill its responsibility to implement a measure, a citizen also could petition for withdrawal of the State's NPDES program or it could petition to have the MS4's permit reopened to require the

MS4 operator to implement the measure.

EPA notes that not every State program that addresses erosion and sediment control from construction sites will be adequate to satisfy the requirement that each regulated small MS4 have a program to the extent required by § 122.34(b)(4). For example, although all NPDES States are required to issue NPDES permits for construction activity that disturbs greater than one acre, the State's NPDES permit program will not necessarily be extensive enough to satisfy a regulated small MS4's obligation under § 122.34(b)(4). NPDES States will not necessarily be implementing all of the required elements of that minimum measure, such as procedures for site plan review in each jurisdiction required to develop a program and procedures for receipt and consideration of information submitted by the public on individual construction sites. In order for a State erosion and sediment control program to satisfy a small MS4 operator's obligation to implement § 122.34(b)(4), the State program would have to include all of the elements of that minimum measure.

Where the operator-permittee is itself performing one or more of the minimum measures, the operator-permittee remains responsible for all of the reporting requirements under § 122.34(f)(3). The operator-permittee's reports should identify each entity that is performing the control measures within the geographic jurisdiction of the regulated small MS4. If the other entity also operates a regulated MS4 and files reports on the progress of implementation of the measures within the geographic jurisdiction of the MS4, then the operator-permittee need not include that same information in its own reports.

If the other entity operates a regulated MS4 and is performing all of the minimum measures for the permittee, the permittee is not required to file the reports required by § 122.34(f)(3). This relief from reporting is specified in § 122.35(a).

Section 122.35 addresses the concerns of some commenters who sought relief for governmental facilities that are classified as small MS4s under today's rule. These facilities frequently discharge storm water through another regulated MS4 and could be regulated by that MS4's program. For example, a State owned office complex that operates its storm sewer system in an urbanized area will be regulated as an MS4 under today's rule even though its system may be subject to the storm water controls of the municipality in

which it is located. Today's rule specifically revised the definition of MS4 to recognize that different levels of government often operate MS4s and that each such separate entity (including the federal government) should be responsible for its discharges. If both MS4s agree, the downstream MS4 can develop a storm water management program that regulates the discharge from both MS4s. The upstream small MS4 operator still must submit an NOI that identifies the entity on which the upstream small MS4 operator is relying to satisfy its permit obligations. No reports are required from the upstream small MS4 operator, but the upstream operator must remain in compliance with the downstream MS4 operator's storm water management program. This option allows small MS4s to work together to develop one storm water management program that satisfies the permit obligations of both. If they cannot agree, the upstream small MS4 operator must develop its own program.

As mentioned previously, comments from federal facilities and State organizations that operate MS4s requested that their permit requirements differ from those of MS4s that are political subdivisions of States (cities, towns, counties, etc.). EPA acknowledges that there are differences; e.g., many federal and State facilities do not serve a resident population and thus might require a different approach to public education. EPA believes, however, that MS4s owned by State and federal governments can develop storm water management plans that address the minimum measures. Federal and State owned small MS4s may choose to work with adjacent municipally owned MS4s to develop a unified plan that addresses all of the required measures within the jurisdiction of all of the contiguous MS4s. The options in § 122.35 minimize the burden on small MS4s that are covered by another MS4's program.

One commenter recommended that if one MS4 discharges into a second MS4, the operator of the upstream MS4 should have to provide a copy of its NOI or permit application to the operator of the receiving MS4. EPA did not adopt this recommendation because the NOI and permit application will be publicly available; but EPA does recommend that NPDES permitting authorities consider it as a possible permit requirement. The commenter also suggested that monitoring data should be collected by the upstream MS4 and provided to the downstream MS4. EPA is not adopting such a uniform monitoring requirement because EPA believes it is more appropriate to let the MS4 operators

work out the need for such data. If necessary, the downstream MS4s might want to make such data a condition to allowing the upstream MS4 to connect to its system.

v. Joint Permit Programs. Many commenters supported allowing the operators of small MS4s to apply as co-permittees so they each would not have to develop their own storm water management program. Today's rule specifically allows regulated small MS4s to join with either other small MS4s regulated under § 122.34(d) or with medium and large MS4s regulated under § 122.26(d).

As is discussed in the previous section, regulated small MS4s may indicate in their NOIs that another entity is performing one or more of its required minimum control measures. Today's rule under § 122.33(b)(1) also specifically allows the operators of regulated small MS4s to jointly submit an NOI. The joint NOI must clearly indicate which entity is required to implement which control measure in each geographic jurisdiction within the service area of the entire small MS4. The operator of each regulated small MS4 remains responsible for the implementation of each minimum measure for its MS4 (unless, as is discussed in the previous section above, the permit recognizes that another entity is responsible for completing the measure.) The joint NOI, therefore, is legally equivalent to each entity submitting its own NOI. EPA is, however, revising the rule language to specifically authorize the joint submission of NOIs in response to comments that suggested that such explicit authorization might encourage programs to be coordinated on a watershed basis.

Section 122.33(b)(2)(iii) authorizes regulated small MS4s to jointly apply for an individual permit to implement today's rule, where allowed by an NPDES permitting authority. The permit application should contain sufficient information to allow the permitting authority to allocate responsibility among the parties under one of the two permitting options in §§ 122.33(b)(2)(i) and (ii).

Section 122.33(b)(3) of today's rule also allows an operator of a regulated small MS4 to join as a co-permittee in an existing NPDES permit issued to an adjoining medium or large MS4 or source designated under the existing storm water program. This co-permittee option applies only with the agreement of all co-permittees. Under this co-permittee arrangement, the operator of the regulated small MS4 must comply with the terms and conditions of the

applicable permit rather than the permit condition requirements of § 122.34 of today's rule. The regulated small MS4 that wishes to be a co-permittee must comply with the applicable requirements of § 122.26(d), but would not be required to fulfill all the permit application requirements applicable to medium and large MS4s. Specifically, the regulated small MS4 is not required to comply with the application requirements of § 122.26(d)(1)(iii) (Part 1 source identification), § 122.26(d)(1)(iv) (Part 1 discharge characterization), and § 122.26(d)(2)(iii) (Part 2 discharge characterization data). Furthermore, the regulated small MS4 operator could satisfy the requirements in § 122.26(d)(1)(v) (Part 1 management programs) and § 122.26(d)(2)(iv) (Part 2 proposed management program) by referring to the adjoining MS4 operator's existing plan. An operator pursuing this option must describe in the permit modification request how the adjoining MS4's storm water program addresses or needs to be supplemented in order to adequately address discharges from the MS4. The request must also explain the role of the small MS4 operator in coordinating local storm water activities and describe the resources available to accomplish the storm water management plan.

EPA sought comments regarding the appropriateness of the application requirements in these subsections of § 122.26(d). One commenter stated that newly regulated smaller MS4s should not be required to meet the existing regulations' Part II application requirements under § 122.26(d) regarding the control of storm water discharges from industrial activity. EPA disagrees. The smaller MS4 operators designated for regulation in today's rule may satisfy this requirement by referencing the legal authority of the already regulated MS4 program to the extent the newly regulated MS4 will rely on such legal authority to satisfy its permit requirements. If the smaller MS4 operator plans to rely on its own legal authorities, it must identify it in the application. If the smaller MS4 operator does not elect to use its own legal authority, they may file an individual permit application for an alternate program under § 122.33(b)(2)(ii).

The explanatory language in § 122.33(b)(3) recommends that the smaller MS4s designated under today's rule identify how an existing plan "would need to be supplemented in order to adequately address your discharges." One commenter suggested that this must be regulatory language and not guidance. EPA disagrees that this needs to be mandatory language.

Since many of the smaller MS4s designated today are “donut holes” within the geographic jurisdiction of an already regulated MS4, the larger MS4’s program generally will be adequate to address the newly regulated MS4’s discharges. The small MS4 applicant should consider the adequacy of the existing MS4’s program to address the smaller MS4’s water quality needs, but EPA is not imposing specific requirements. Where circumstances suggest that the existing program is inadequate with respect to the newly designated MS4 and the applicant does not address the issue, the NPDES permitting authority must require that the existing program be supplemented.

Commenters recommended that the application deadline for smaller MS4s designated today be extended so that existing regulated MS4s would not have to modify their permit in the middle of their permit term, provided that permit renewal would occur within a reasonable time (12 to 18 months) of the deadline. In response, EPA notes that today’s rule allows operators of newly designated small MS4s up to three years and 90 days from the promulgation of today’s rule to submit an application to be covered under the permit issued to an already regulated MS4. The permitting authority has a reasonable time after receipt of the application to modify the existing permit to include the newly designated source. If an existing MS4’s permit is up for renewal in the near future, the operator of a newly designated small MS4 may take that into account when timing its application and the NPDES permitting authority may take that into account when processing the application.

Another commenter suggested that the rule should include a provision to allow permit application requirements for smaller MS4s designated today to be determined by the permitting authority to account for the particular needs/wants of an already regulated MS4 operator. EPA does not believe that the regulations should specifically require this approach. When negotiating whether to include a newly designated MS4 in its program, the already regulated MS4 operator may require the newly designated MS4’s operator to provide any information that is necessary.

The co-permitting approach allows small MS4s to take advantage of existing programs to ease the burden of creating their own programs. The operators of regulated small MS4s, however, may find it simpler to apply for a program under today’s rule, and to identify the medium or large MS4 operator that is

implementing portions of its § 122.34(b) minimum measures.

d. Evaluation and Assessment

Under today’s rule, operators of regulated small MS4s are required to evaluate the appropriateness of their identified BMPs and progress toward achieving their identified measurable goals. The purpose of this evaluation is to determine whether or not the MS4 is meeting the requirements of the minimum control measures. The NPDES permitting authority is responsible for determining whether and what types of monitoring needs to be conducted and may require monitoring in accordance with State/Tribe monitoring plans appropriate to the watershed. EPA does not encourage requirements for “end-of-pipe” monitoring for regulated small MS4s. Rather, EPA encourages permitting authorities to carefully examine existing ambient water quality and assess data needs. Permitting authorities should consider a combination of physical, chemical, and biological monitoring or the use of other environmental indicators such as exceedance frequencies of water quality standards, impacted dry weather flows, and increased flooding frequency. (Claytor, R. and W. Brown. 1996. *Environmental Indicators to Assess Storm Water Control Programs and Practices*. Center for Watershed Protection, Silver Spring, MD.) Section II.L., Water Quality Issues, discusses monitoring in greater detail.

As recommended by the Intergovernmental Task Force on Monitoring Water Quality (ITFM), the NPDES permitting authority is encouraged to consider the following watershed objectives in determining monitoring requirements: (1) To characterize water quality and ecosystem health in a watershed over time, (2) to determine causes of existing and future water quality and ecosystem health problems in a watershed and develop a watershed management program, (3) to assess progress of watershed management program or effectiveness of pollution prevention and control practices, and (4) to support documentation of compliance with permit conditions and/or water quality standards. With these objectives in mind, the Agency encourages participation in group monitoring programs that can take advantage of existing monitoring programs undertaken by a variety of governmental and nongovernmental entities. Many States may already have a monitoring program in effect on a watershed basis. The ITFM report is included in the docket for today’s rule

(Intergovernmental Task Force on Monitoring Water Quality. 1995. *The Strategy for Improving Water-Quality Monitoring in the United States: Final Report of the Intergovernmental Task Force on Monitoring Water Quality*. Copies can be obtained from: U.S. Geological Survey, Reston, VA.).

EPA expects that many types of entities will have a role in supporting group monitoring activities—including federal agencies, State agencies, the public, and various classes or categories of point source dischargers. Some regulated small MS4s might be required to contribute to such monitoring efforts. EPA expects, however, that their participation in monitoring activities will be relatively limited. For purposes of today’s rule, EPA recommends that, in general, NPDES permits for small MS4s should not require the conduct of any additional monitoring beyond monitoring that the small MS4 may be already performing. In the second and subsequent permit terms, EPA expects that some limited ambient monitoring might be appropriately required for perhaps half of the regulated small MS4s. EPA expects that such monitoring will only be done in identified locations for relatively few pollutants of concern. EPA does not anticipate “end-of-pipe” monitoring requirements for regulated small MS4s.

EPA received a wide range of comments on this section of the rule. Some commenters believe that EPA should require monitoring; others want a strong statement that the newly regulated small MS4s should not be required to monitor. Many commenters raised questions about exactly what EPA expects MS4s to do to evaluate and assess their BMPs. EPA has intentionally written today’s rule to provide flexibility to both MS4s and permitting authorities regarding appropriate evaluation and assessment. Permitting authorities can specify monitoring or other means of evaluation when writing permits. If additional requirements are not specified, MS4s can decide what they believe is the most appropriate way to evaluate their storm water management program. As mentioned above, EPA expects that the necessity for monitoring and its extent may change from permit cycle to permit cycle. This is another reason for making the evaluation and assessment rule requirements very flexible.

i. Recordkeeping. The NPDES permitting authority is required to include at least the minimum appropriate recordkeeping conditions in each permit. Additionally, the NPDES permitting authority can specify that permittees develop, maintain, and/or

submit other records to determine compliance with permit conditions. The MS4 operator must keep these records for at least 3 years but is not required to submit records to the NPDES permitting authority unless specifically directed to do so. The MS4 operator must make the records, including the storm water management program, available to the public at reasonable times during regular business hours (see 40 CFR 122.7 for confidentiality provision). The MS4 operator is also able to assess a reasonable charge for copying and to establish advance notice requirements for members of the public.

EPA received a comment that questioned EPA's authority to require MS4s to make their records available to the public. EPA disagrees with the commenter and believes that the CWA does give EPA the authority to require that MS4 records be available. It is also more practical for the public to request records directly from the MS4 than to request them from EPA who would then make the request to the MS4. Based on comments, EPA revised the proposed rule so as not to limit the time for advance notice requirements to 2 business days.

ii. Reporting. Under today's rule, the operator of a regulated small MS4 is required to submit annual reports to the NPDES permitting authority for the first permit term. For subsequent permit terms, the MS4 operator must submit reports in years 2 and 4 unless the NPDES permitting authority requires more frequent reports. EPA received several comments supporting this timing for report submittal. Other commenters suggested that annual reports during the first permit cycle are too burdensome and not necessary. EPA believes that annual reports are needed during the first 5-year permit term to help permitting authorities track and assess the development of MS4 programs, which should be established by the end of the initial term. Information contained in these reports can also be used to respond to public inquiries.

The report must include (1) the status of compliance with permit conditions, an assessment of the appropriateness of identified BMPs and progress toward achieving measurable goals for each of the minimum control measures, (2) results of information collected and analyzed, including monitoring data, if any, during the reporting period, (3) a summary of what storm water activities the permittee plans to undertake during the next reporting cycle, and (4) a change in any identified measurable goal(s) that apply to the program elements.

The NPDES permitting authority is encouraged to provide a brief two-page reporting format to facilitate compiling and analyzing the data from submitted reports. EPA does not believe that submittal of a brief annual report of this nature is overly burdensome, and has not changed the required reporting time frame from the proposal. The permitting authority will use the reports in evaluating compliance with permit conditions and, where necessary, will modify the permit conditions to address changed conditions.

iii. Permit-As-A-Shield. Section 122.36 describes the scope of authorization (i.e. "permit-as-a-shield") under an NPDES permit as provided by section 402(k) of the CWA. Section 402(k) provides that compliance with an NPDES permit is deemed compliance, for purposes of enforcement under CWA sections 309 and 505, with CWA sections 301, 302, 306, 307, and 403, except for any standard imposed under section 307 for toxic pollutants injurious to human health.

EPA's Policy Statement on Scope of Discharge Authorization and Shield Associated with NPDES Permits, originally issued on July 1, 1994, and revised on April 11, 1995, provides additional information on this matter.

e. Other Applicable NPDES Requirements

Any NPDES permit issued to an operator of a regulated small MS4 must also include other applicable NPDES permit requirements and standard conditions, specifically the applicable requirements and conditions at 40 CFR 122.41 through 122.49. Reporting requirements for regulated small MS4s are governed by § 122.34 and not the existing requirements for medium and large MS4s at § 122.42(c). In addition, the NPDES permitting authority is encouraged to consult the Interim Permitting Approach, issued on August 1, 1996. The discussion on the Interim Permitting Approach in Section I.L.1, Water Quality Based Effluent Limits, provides more information. The provisions of §§ 122.41 through 122.49 establish permit conditions and limitations that are broadly applicable to the entire range of NPDES permits. These provisions should be interpreted in a manner that is consistent with provisions that address specific classes or categories of discharges. For example, § 122.44(d) is a general requirement that each NPDES permit shall include conditions to meet water quality standards. This requirement will be met by the specific approach outlined in today's rule for the implementation of BMPs. BMPs are the most appropriate

form of effluent limitations to satisfy technology requirements and water quality-based requirements in MS4 permits (see the introduction to Section I.H.3, Municipal Permit Requirements, Section I.H.3.h, Reevaluation of Rule, and the discussion of the Interim Permitting Policy in Section I.L.1. below).

f. Enforceability

NPDES permits are federally enforceable. Violators may be subject to the enforcement actions and penalties described in CWA sections 309, 504, and 505 or under similar water pollution enforcement provisions of State, tribal or local law. Compliance with a permit issued pursuant to section 402 of the Clean Water Act is deemed compliance, for purposes of sections 309 and 505, with sections 301, 302, 306, 307, and 403 (except any standard imposed under section 307 for toxic pollutants injurious to human health).

g. Deadlines

Today's final rule includes "expeditious deadlines" as directed by CWA section 402(p)(6). In proposed § 122.26(e), the permit application for the "ISTEA" facilities was maintained as August 7, 2001 and the permit application deadline for storm water discharges associated with other construction activity was established as 3 years and 90 days from the final rule date. In proposed § 122.33(c)(1), operators of regulated small MS4s were required to seek permit coverage within 3 years and 90 days from the date of publication of the final rule. In proposed § 122.33(c)(2), operators of regulated small MS4s designated by the NPDES permitting authority on a local basis under § 122.32(a)(2) must seek coverage under an NPDES permit within 60 days of notice, unless the NPDES permitting authority specifies a later date.

In order to increase the clarity of today's final rule, EPA has changed the location of some of the above requirements. All application deadlines for both Phase I and Phase II are now listed or referenced in § 122.26(e). Section 122.26(e)(1) contains the deadlines for storm water associated with industrial activity. Paragraph (i) has been changed to correct a typographical error. Paragraph (ii) has been revised to reflect the changed application date for "ISTEA" facilities. (See discussion in section I.3, ISTEA Sources). The application deadline for storm water discharges associated with other construction activity is now in a new § 122.26(e)(8). The application deadline for regulated small MS4s

remains in § 122.33(c) because this section is written in “readable regulation” format, but it is also described in a new § 122.26(e)(9).

Under today’s rule, permitting authorities are allowed up to 3 years to issue a general permit and MS4s designated under § 122.32(a)(1) are allowed up to 3 years and 90 days to submit a permit application. Operators of regulated small MS4s that choose to be a co-permittee with an adjoining MS4 with an existing NPDES storm water permit must apply for a modification of that permit within the same time frame. Several commenters stated that 90 days was not adequate time to submit an NOI. This might be true if facilities did not start developing their storm water program until publication of their general permit. In fact, municipalities should start developing their storm water program upon publication of today’s final rule, if they have not already done so. Municipalities that are uncertain if they fall within the urbanized area should ask their permitting authority. EPA believes that municipalities should not automatically take three years and 90 days to develop a program and submit their NOI. Three years is the maximum amount of time to issue a general permit. MS4s that are automatically designated under today’s rule may have less than 3 years and 90 days if the permitting authority issues a permit that requires submission of NOIs before that time. EPA encourages States to modify their NPDES program to include storm water and issue their permits as soon as possible. It is important for permitting authorities to keep their municipalities informed of their progress in developing or modifying their NPDES storm water requirements.

EPA recognizes that MS4s brought into the program due to the 2000 Census calculations do not have as much time to develop a program as those already designated from the 1990 Census. However, the official Bureau of the Census urbanized area calculation for the 2000 Census is expected to be published in the **Federal Register** in the spring of 2002, which should give the potentially affected MS4s adequate time to prepare for compliance under the applicable permit. However, if the publication of this information is delayed, MS4s in newly designated urbanized areas will have 180 days from the time the new designations are published to submit an NOI, consistent with the time frame for other regulated MS4s that are designated after promulgation of the rule.

The proposed application deadline for MS4s designated under § 122.32(a)(2)

was within 60 days of notice. Many commenters stated that 60 days does not provide adequate time for the preparation of an NOI or permit application. EPA agrees that newly designated MS4s may not be aware that they might be designated since the permitting authority could take several years to develop designation criteria. EPA has decided that the application time frame for these facilities should be consistent with the 180 days allowed for facilities designated under §§ 122.26(a)(9)(i)(C) and (D). Section 122.33(c)(2) of today’s final rule contains the modified time frame of 180 days to apply for coverage.

h. Reevaluation of Rule

The municipal caucus of the Storm Water Phase II FACA Subcommittee asked EPA to demonstrate its commitment to revisit the municipal requirements of today’s rule and make changes where necessary after evaluating the storm water program and researching the effectiveness of municipal BMPs. In § 122.37 of today’s final rule, EPA commits to revisiting the regulations for the municipal storm water discharge control program after completion of the first two permit terms. EPA intends to use this time to work closely with stakeholders on research efforts. Gathering and analyzing data related to the storm water program, including data regarding the effectiveness of BMPs, is critical to EPA’s storm water program evaluation. EPA does not intend to change today’s NPDES municipal storm water program until the end of this period, except under the following circumstances: a court decision requires changes; a technical change is necessary for implementation; or the CWA is modified, thereby requiring changes. After careful analysis, EPA might also consider changes from consensus-based stakeholder requests regarding requirements applicable to newly regulated MS4s. EPA will apply the August 1, 1996, Interim Permitting Approach to today’s program during this interim period and encourages all permitting authorities to use this approach in municipal storm water permits for newly regulated MS4s and in determining MS4 permit requirements under a TMDL approach. After careful consideration of the data, EPA will make modifications as necessary.

EPA received comments that supported waiting two permit cycles before re-evaluating the rule and other comments that requested re-evaluation much sooner. EPA anticipates two full permit cycles are necessary to obtain

enough data to significantly evaluate the rule. The re-evaluation time frame of 13 years from today remains as proposed.

I. Other Designated Storm Water Discharges

1. Discharges Associated with Small Construction Activity

Section 122.26(b)(15) of today’s rule designates certain construction activities for regulation as “storm water discharges associated with small construction activity.” Specifically, storm water discharges from construction activity equal to or greater than 1 acre and less than 5 acres are automatically designated except in those circumstances where the operator (i.e., person responsible for discharges that might occur) certifies to the permitting authority that one of two specific waiver circumstances (described in section b. below) applies. Sites below one acre may be designated under § 122.26(b)(15)(ii) where necessary to protect water quality.

Today’s rule regulates these construction-related storm water sources under CWA section 402(p)(6) to protect water quality rather than under CWA section 402(p)(2). Designation under 402(p)(6) gives States and EPA the flexibility to waive the permit requirement for construction activity that is not likely to impair water quality, and to designate additional sources below one acre that are likely to cause water quality impairment. Thus, the one acre threshold of today’s rule is not an absolute threshold like the five acre threshold that applies under the existing storm water rule.

Today’s rule regulating certain storm water discharges from construction activity disturbing less than 5 acres is consistent with the 9th Circuit remand in *NRDC v. EPA*, 966 F.2d 1292 (9th Cir. 1992). In that case, the court remanded portions of the existing storm water regulations related to discharges from construction sites. The existing Phase I regulations define “storm water discharges associated with industrial activity” to include storm water discharges from construction sites disturbing 5 acres or more of total land area (see 40 CFR 122.26(b)(14)(x)). In its decision, the court concluded that the 5-acre threshold was improper because the Agency had failed to identify information “to support its perception that construction activities on less than 5 acres are non-industrial in nature” (966 F.2d at 1306). The court remanded the exemption to EPA for further proceedings (966 F.2d at 1310). EPA’s objectives in today’s action include an effort to (1) address the 9th Circuit

remand to reconsider regulation of storm water discharges from construction activities that disturb less than 5 acres of land, (2) address water quality concerns associated with such activities, and (3) balance conflicting recommendations and concerns of stakeholders in the regulation of additional construction activity.

EPA responded to the Ninth Circuit's decision by designating discharges from construction activities that disturb between 1 and 5 acres as "discharges associated with small construction activity" under CWA section 402(p)(6), rather than as "discharges associated with industrial activity" under CWA section 402(p)(2)(B). Although a size criterion alone may be an indicator of whether runoff from construction sites between 1 and 5 acres is "associated with industrial activity," the Agency is instead relying on a size threshold in tandem with provisions that allow for designations and waivers based on potential for "predicted water quality impairments" to regulate construction sites between 1 and 5 acres under CWA section 402(p)(6). This approach was chosen by the Agency for the sake of simplicity and certainty and, most importantly, to protect water quality consistent with the mandate of CWA section 402(p)(6). Today's rule also includes extended application deadlines for this new category of dischargers under the authority of CWA section 402(p)(6) (see § 122.26(e)(8) of today's rule).

In today's rule, EPA is regulating storm water discharges from additional construction sites to better protect the Nation's waters, while remaining sensitive to a concern that the Agency should not regulate discharges from construction sites that might not or do not have adverse water quality impacts. EPA believes that today's rule will successfully accomplish this objective by establishing a 1-acre threshold nationwide that includes the flexibility to allow the permitting authority to both waive requirements for discharges from sites that are not expected to cause adverse water quality impacts and to designate discharges from sites below 1-acre based on adverse water quality impacts.

In addition to the diminishing water quality benefits of regulating all sites below one acre, the Agency relied on practical considerations in establishing a one acre threshold and not setting a lower threshold. Regardless of the threshold established by EPA, a NPDES permit can only be required if a construction site has a point source discharge. A point source discharge means that pollutants are added to

waters of the United States through a discernible, confined, discrete conveyance. "Sheet flow" runoff from a small construction site would not result in a point source discharge unless and until it channelized. As the amount of disturbed land surface decreases, precipitation is less likely to channelize and create a "point source" discharge (assuming the absence of steep slopes or other factors that lead to increased channelization). Categorical designation of very small sites may create confusion about applicability of the NPDES permitting program to those sites. EPA's one acre threshold reflects, in part, the need to recognize that smaller sites are less likely to result in point source discharges. Of course, the NPDES permitting authority could designate smaller sites (below one acre, assuming point source discharges occur from the smaller designated sites) for regulation if a watershed or other local assessment indicated the need to do so. The Phase II rule includes this designation authority at 40 CFR 122.26(a)(9)(i)(D) and (b)(15)(ii).

The one acre threshold also provides an administrative tool for more easily identifying those sites that are identified for coverage by the rule (but may receive a waiver) and those that are not automatically covered (but may be designated for inclusion). Although all construction sites less than five acres could have a significant water quality impact cumulatively, EPA is automatically designating for permit coverage only those storm water discharges from construction sites that disturb land equal to or greater than one acre. Categorical regulation of discharges from construction below this one acre threshold would overwhelm the resources of permitting authorities and might not yield corresponding water quality benefits. Construction activities that disturb less than one acre make up, in total, a very small percentage of the total land disturbance from construction nationwide. The one acre threshold is reasonable for accomplishing the water quality goals of CWA section 402(p)(6) because it results in 97.5% of the total acreage disturbed by construction being designated for coverage by the NPDES storm water program, while excluding from automatic coverage the numerous smaller sites that represent 24.7% of the total number of construction sites.

Some commenters believed that EPA has not adequately identified water quality problems associated with storm water discharges from construction activity disturbing less than five acres. Other commenters believed that storm water discharges from small

construction activity is a significant water quality problem nationwide. Section I.B.3, Construction Site Runoff, provides a detailed discussion of adverse water quality impacts resulting from construction site storm water discharges. EPA is regulating storm water discharges from construction activity disturbing between 1 and 5 acres because the cumulative impact of many sources, and not just a single identified source, is typically the cause for water quality impairments, particularly for sediment-related water quality standards.

Several commenters requested that EPA regulate discharges from small construction activity as "discharges associated with industrial activity" under CWA 402(p)(4) and not, as proposed, as "storm water discharges associated with other activity" under CWA 402(p)(6). EPA is regulating discharges from small construction sites as "small construction activity" under the authority of CWA section 402(p)(6), rather than section 402(p)(4), to ensure that regulation of these sources is water quality-sensitive. CWA section 402(p)(6) affords the opportunity for designations and waivers of sources based on potential for "predicted water quality impairments." Regulation of storm water "associated with industrial activity" does not necessarily focus regulation to protect water quality.

a. Scope

The definition of "storm water discharges associated with small construction activity" includes discharges from construction activities, such as clearing, grading, and excavating activities, that result in the disturbance of equal to or greater than 1 acre and less than 5 acres (see § 122.26(b)(15)(i)). Such activities could include: road building; construction of residential houses, office buildings, or industrial buildings; or demolition activity. The definition of "storm water discharges associated with small construction activity" also includes any other construction activity, regardless of size, designated based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States (§ 122.26(b)(15)(ii)). This designation is made by the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator.

For the purposes of today's rule, the definition of "storm water discharges associated with small construction activity" includes discharges from activities disturbing less than 1 acre if that construction activity is part of a

“larger common plan of development or sale” with a planned disturbance of equal to or greater than 1 acre of land. A “larger common plan of development or sale” means a contiguous area where multiple separate and distinct construction activities are planned to occur at different times on different schedules under one plan, *e.g.*, a housing development of five ¼ acre lots (§ 122.26(b)(15)(i)).

In addition to the regulatory text for smaller construction, the Agency is also revising the existing text of § 122.26(b)(14)(x) to clarify EPA’s intention regarding construction projects involving a larger common plan of development or sale ultimately disturbing 5 or more acres. Operators of such sites are required to seek coverage under an NPDES permit regardless of the number of lots in the larger plan because designation for permit coverage is based on the total amount of land area to be disturbed under the common plan. This designation attempts to address the potential cumulative effects of numerous construction activities concentrated in a given area.

Several commenters asked that EPA allow the permitting authority to set the appropriate size threshold based on water quality studies. While EPA agrees that location-specific water quality studies provide an ideal information base from which to make regulatory decisions, today’s rule establishes a default standard for regulation in the absence of location-specific studies. The rule does allow for deviation from the default standard through additional designations and waivers, however, when supported by location-specific water quality information. The rule codifies the ability of permitting authorities to provide waivers for sites greater than or equal to one acre (the default standard) and designate additional discharges from small sites below one acre when location-specific information suggests that the default 1 acre standard is either unnecessary (waivers) or too limited (designations) to protect water quality.

Some commenters wanted EPA to base the regulation of storm water discharges from construction sites not only on size, but also on the duration and intensity of activity occurring on the site. EPA believes that a national 1-acre threshold, in combination with waivers and additional designations, is the most effective and simplest way to address adverse water quality impacts from storm water from small construction sites. Moreover, as discussed below, the waiver for rainfall erosivity does account for projects of limited duration. EPA believes,

however, that the intensity of activity occurring on-site would be a very difficult condition to quantify.

Many commenters requested that EPA maintain the 5 acre threshold from the existing regulations, which include opportunities for site-specific designation, as the regulatory scope for regulating storm water from construction sites, *i.e.*, that the Agency not automatically regulate storm water discharges from sites less than 5 acres. Several commenters wanted construction requirements to be applied to sites smaller than 1 acre, while some commenters suggested alternative thresholds of 2 or 3 acres. The rest of the commenters supported the 1 acre threshold. None of the commenters presented any data or rationales to support a specific size threshold.

EPA examined alternative size thresholds, including 0.5 acre, 1 acre, 2 acres and 5 acres. EPA had difficulty evaluating the alternative size thresholds because, while directly proportional to the size of the disturbed site, the water quality threat posed by discharges from construction sites of differing sizes varies nationwide, depending on the local climatological, geological, geographical, and hydrological influences. In order to ensure improvements in water quality nationwide, however, today’s rule does not allow various permitting authorities to establish different size thresholds except based on the waiver and designation provisions of the rule. EPA believes that the water quality impact from small construction sites is as high as or higher than the impact from larger sites on a per acre basis. By selecting the 1 acre size threshold and coupling it with waivers and additional designations, EPA is seeking to standardize improvement of water quality on a national basis while providing permitting authorities with the opportunity to designate those unregulated activities causing water quality impairments regardless of site size, as well as to waive requirements when information demonstrates that regulation is unnecessary.

EPA recognizes that the size criterion alone may not be the most ideal predictor of the need for regulation, but effective protection of water quality depends as much on simplicity in implementation as it does on the scientific information underlying the regulatory criteria. The default size criterion of 1 acre will ensure protection against adverse water quality impacts from storm water from small construction sites while not overburdening the resources of permitting authorities and the

construction industry to implement the program to protect water quality in the first place.

One commenter stated a need to clarify whether routine road maintenance is considered construction activity for the purpose of today’s rule. The NPDES general permit for discharges from construction sites larger than 5 acres defined “commencement of construction” as the *initial* disturbance of soils associated with clearing, grading, or excavating activities or other construction activities (63 FR 7913). For construction sites disturbing less than 5 acres, EPA does not consider construction activity to include *routine* maintenance performed to maintain the *original* line and grade, hydraulic capacity, or original purpose of the facility.

Two commenters believed that the Multi-Sector General Permit for storm water discharges from industrial activities (MSGP) (60 FR 50804) already applies to storm water discharges from construction activities at oil and gas exploration and production sites and asked for a clarification on this issue. Commenters also requested a single general permit to authorize both industrial storm water discharges and construction site discharges which occur at the same industrial site.

Currently, when construction activity disturbing more than 5 acres occurs on an industrial site covered by the MSGP, authorization under a separate NPDES construction permit is needed because the MSGP does not include the “construction” industrial sector. While the MSGP does address sediment and erosion control, it is not as specific as the NPDES general permit for storm water discharges from construction activities disturbing more than 5 acres. Though permitting authorities could conceivably develop a single general permit to authorize storm water discharges associated with construction activity at these industrial facilities, the commenter’s request is not addressed by today’s rulemaking. When today’s rule is implemented through general permits (to be issued later), the permitting authority will have discretion whether or not to incorporate the permit requirements for both the industrial storm water discharges and construction site storm water discharges into a single general permit. This type of request should be addressed to the permitting authority.

One commenter suggested that discharges from small construction sites should be regulated through a “self-implementing rule” approach. While today’s rule is not a self-implementing rule, it does add § 122.28(b)(2)(v), which

gives the permitting authority the discretion to authorize a construction general permit for sites less than 5 acres without submitting a notice of intent. Such non-registration general permits function similarly to self-implementing rules, but are, in fact, permits. Today's rule will be implemented through NPDES permits rather than self-implementing regulations to capitalize on the compliance, tracking, enforcement, and public participation associated with NPDES permits (see discussion in section II.C).

Other commenters believed that only the permitting authority should regulate construction site storm water discharges (under a NPDES permit) and that a small MS4 operator's regulation of storm water discharges associated with construction (under the small MS4 NPDES storm water program) is redundant. EPA disagrees that control measure implementation by the NPDES authority and the small MS4 operator is redundant. To the extent the two efforts overlap, today's rule provides for consolidation and coordination of substantive requirements via incorporation by reference permitting. Small MS4s operators may choose to impose more prescriptive requirements than an NPDES permitting authority based on localized water quality needs. In those cases, EPA intends that the substantive requirements from the small MS4 program should apply as the NPDES permit requirements for the construction site discharger. In cases where a small MS4 program does not prioritize and focus on storm water from construction sites (beyond the small MS4 minimum control measure in today's rule, which does not require the small MS4 operator to control construction site discharges in a manner as prescriptive as is expected for discharges regulated under NPDES permits), the Agency intends that the NPDES general permit will provide the substantive standards applicable to the construction site discharge. EPA does anticipate, however, that implementation of MS4 programs to address construction site runoff within their jurisdiction will enhance overall NPDES compliance by construction site dischargers. EPA also notes that under § 122.35(b), the permitting authority may recognize its own program to control storm water discharges from construction sites in lieu of requiring such a program in an MS4's NPDES permit, provided that the permitting authority's program satisfies the requirements of § 122.34(b)(4), including, for example, procedures for site plan reviews and consideration of

information submitted by the public on individual construction sites in each jurisdiction required to be covered by the program.

b. Waivers

Under § 122.26(b)(15)(i) of today's rule, NPDES permitting authorities may waive today's requirement for construction site operators to obtain a permit in two circumstances. The first waiver is intended to apply where little or no rainfall is expected during the period of construction. The second waiver may be granted when a TMDL or equivalent analysis indicates that controls on construction site discharges are not needed to protect water quality.

The first waiver is based on "low predicted rainfall erosivity" which can be found using tables of rainfall-runoff erosivity (R) values published for each region in the U.S. R factors are published in the U.S. Department of Agriculture (USDA) Agricultural Handbook 703 (Renard, K.G., Foster, G.R., Weesies, G.A., McCool, D.K., and D.C. Yoder. 1997. *Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)*. U.S. Department of Agriculture Handbook 703). The R factor varies based on the time during the year when construction activity occurs, where in the country it occurs, and how long the construction activity lasts. The permitting authority may determine, using Handbook 703, which times of year, if any, the waiver opportunity is available for construction activity. EPA will provide assistance either through computer programs or the World Wide Web on how to determine whether this waiver applies for a particular geographic area and time period. Application of this waiver for regulatory purposes will be determined by the authorized NPDES authority. This waiver is discussed further in the following section titled Rainfall-Erosivity Waiver.

The second waiver is based on a consideration of ambient water quality. This waiver is available after a State or EPA develops and implements TMDLs for the pollutant(s) of concern from storm water discharges associated with construction activity. This waiver is also available for sites discharging to non-impaired waters that do not require TMDLs, when an equivalent analysis has determined allocations for small construction sites for the pollutant(s) of concern or determined that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant

contributions from all sources, and a margin of safety. The Agency envisions an equivalent analysis that would demonstrate that water quality is *not* threatened by storm water discharges from small construction activity. This waiver is discussed further below in the sections titled TMDL Waiver and Water Quality Issues.

The proposed rule included a waiver based on "low predicted soil loss." This waiver provision would have been applicable on a case-by-case basis where the annual soil loss rate for the period of construction for a site, using the Revised Universal Soil Loss Equation (RUSLE), would be less than 2 tons/acre/year. The annual soil loss rate of less than 2 tons/acre/year would be calculated through the use of the RUSLE equation, assuming the constants of no ground cover and no runoff controls in place.

Several commenters found the low soil loss waiver too complex and impractical, and stated that expertise is not available at the local level to prepare and evaluate eligibility for the waiver. Another commenter questioned whether two tons/acre/year was an appropriate threshold for predicting adverse water quality impacts. Two other commenters said that RUSLE was never intended to predict off-site impacts and is not an indicator of potential harm to water quality. EPA agrees with the commenters on the difficulty associated with determining and implementing this waiver. Most construction site operators are not familiar with the RUSLE program, and the potential burden on the permitting authority, construction industry, USDA's Natural Resources Conservation Service and conservation districts probably would have been significant. The Agency has not included this waiver in the final rule.

Two commenters asked that EPA allow States the flexibility to develop their own waiver criteria but did not suggest how the Agency (or affected stakeholders) could evaluate the acceptability of alternative State waiver criteria. Therefore, the final rule does not provide for any such alternative waivers. If a State does seek to develop alternate waiver criteria, then EPA procedures afford the opportunity for subsequent actions, for example, under the Project XL Program in EPA's Office of Reinvention, which seeks cleaner, smarter, and cheaper solutions to environmental problems. Many commenters suggested that EPA extend these waivers to existing industrial storm water regulations for construction activity greater than 5 acres. These construction site discharges are

regulated as industrial storm water discharges under CWA 402(p)(2) and are not eligible for such water quality-based waivers.

Two commenters were concerned that waivers would create a potential for significant degradation of small streams. EPA disagrees. If small streams are threatened, the permitting authority would choose not to provide any waivers. In addition, permitting authorities may protect small streams by designating discharges from small construction activity based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the U.S.

Two commenters asked that the waiver options be eliminated. They felt it would create a gross inequity within the construction community if some projects will not be subject to the requirements of today's rule. While the comments may be valid, EPA disagrees that waivers should be disallowed on this basis. Construction site discharges that qualify for a waiver from permitting requirements are not expected to present a threat to water quality, which is the basis for designation and regulation under today's rule.

A number of commenters suggested additional waivers in cases where new development will result in no additional adverse impacts to water quality as compared to the existing development it replaces. EPA believes these waivers are either unworkable or unnecessary. It would be very difficult for most construction operators to determine, as well as for other stakeholders to verify, on a site-by-site basis, that there is no potential for adverse impact to water quality compared to the replaced development.

Other commenters proposed waivers in cases where a local erosion and sediment control program covers the project or a separate waiver for small linear utility projects. Instead of waivers, today's rule addresses the first suggestion through the qualifying program provision described in the section titled Cross-Referencing State/Local Erosion and Sediment Control Programs below. Today's rule provides waivers for small linear projects in so far as they satisfy conditions for low rainfall erosivity. (See § 122.26(b)(15)(i)(A).)

Other commenters suggested waivers based on distance to water body, existence of vegetated buffer around water body, slope of disturbed land, or if discharging to very large bodies of water. As a result of public outreach, EPA believes that these proposed waivers would be generally unworkable

for construction site dischargers and permitting authorities because of the difficulty in applying them to all small sites.

One commenter mentioned that waivers for the R factor (rainfall-erosivity) and soil loss are effluent standards that have not been developed in accordance with sections 301 and 304 of the CWA. EPA disagrees that these sections are relevant to the designation of sources in today's rule. The waiver provisions in this section of the rule are jurisdictional because they affect the scope of the universe of entities subject to the NPDES program. Therefore, the waiver provisions are not themselves substantive control standards implemented through NPDES permits, and thus, not subject to the statutory criteria in sections 301 and 304.

Another commenter stated that waivers would allow exemptions to the technology based requirements and would thus be inconsistent with the two-fold approach of the CWA (a technology based minimum and a water quality based overlay). EPA acknowledges that the CWA does not generally provide for waivers for the Act's technology-based requirements. The waiver provisions do not create exemptions from technology-based standards that apply to NPDES dischargers; they provide exemption from the underlying requirement for an NPDES permit in the first place. Protection of water quality is the reason these smaller sites are designated for regulation under NPDES. The Act's two fold approach imposes more stringent water quality based effluent limitations when technology-based limitations applicable to regulated dischargers are insufficient to meet water quality standards. Under today's rule, water quality protection is the basis for determining which of the unregulated sources should be regulated at all. Thus, today's rule is entirely consistent with the Act's two fold approach.

i. Rainfall-Erosivity Waiver. The rainfall-erosivity waiver under § 122.26(b)(15)(i)(A) is intended to exempt the requirements for a permit when and where negligible rainfall/runoff-erosivity is expected. In the development of the Universal Soil Loss Equation, analysis of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy times the maximum 30 minute intensity. The average annual sum of the storm energy and intensity values for an area comprise the R factor—the rainfall erosivity index. A detailed explanation of the R factor can be found in

Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE) (USDA, 1997).

This waiver is time-sensitive and is dependent on when during the year a construction activity takes place, how long it lasts, and the expected rainfall and intensity during that time. R factors vary based on location. EPA anticipates that this waiver opportunity responds to concerns about the requirement for a permit when it is not expected to rain, especially in the arid areas of the U.S. Under today's rule, the permitting authority could waive the requirements for a permit for time periods when the rainfall-erosivity factor ("R" in RUSLE) is less than five during the period of construction. For the purposes of calculating this waiver, the period of construction activity starts at the time of initial disturbance and ends with the time of final stabilization. The operator must submit a written certification to the Director in order to apply for such a waiver. EPA believes that those areas receiving negligible rainfall during certain times of the year are unlikely to have storm events causing discharges that could adversely impact receiving streams. Consequently, BMPs would not be necessary on those smaller sites. This waiver is most applicable to projects of short duration and to the arid regions of the country where the occurrence of rainfall follows a cyclic pattern—between no rain and extremely heavy rain. EPA review of rainfall records for these areas indicates that, during periods of the year when the number of events and quantity of rain are low, storm water discharges from the smaller construction sites regulated under today's rule should be minimal.

Some commenters supported the use of the R factor as a waiver, while others felt that a waiver based on rainfall statistics ignores the fact that it may rain on any given day and it is the cumulative effect of wet weather discharges which cause water quality impairments. A commenter also asked what happens in "El Nino" years when significantly more rainfall than normal occurs. Another commenter also expressed concern that this waiver was not based on a measured water quality impact, but instead on an indicator of potential impact. In response to the previous comments, EPA notes that, under CWA 402(p)(6), sources are designated on their *potential* for adverse impact. Designation under the section is prospective, not retrospective or remedial only. For that reason, the waivers under today's rule also operate prospectively. EPA wanted to waive requirements for sites with little

potential to impair water quality, and the R factor is the most straightforward way to do this. The permitting authority, if electing to use waivers, could always suspend the use of waivers in certain areas or during certain times. In addition, the permitting authority may choose to use a lower R factor threshold than the one set by EPA. Application of this waiver is at the discretion of the permitting authority, subject only to the limitation that R factors cannot exceed 5.

One commenter expressed the need for EPA to provide a justification for the threshold value used for the R factor. None of the commenters included any data to show that EPA's proposed R factor of 2 was either too high or too low. EPA is using the R factor as an indicator of the potential to impact water quality. In an effort to determine which R threshold should be used, EPA conducted additional analysis of the rainfall/runoff erosivity factor for 134 sites across the country. For an R factor threshold of 5, approximately 12% of sites would be waived if the project period lasted 6 months, 27% for 3 months, 47% for 1 month, and 60% of sites would be waived if the project lasted for only 15 days. None of the 134 sites would be waived if the project lasted an entire year. For an R factor threshold of 2, approximately 9% of sites would be waived if the project period lasted 6 months, 15% for 3 months, 31% for 1 month, and 43% for 15 days. For an R factor threshold of 10, approximately 22% of sites would be waived if the project period lasted 6 months, 37% for 3 months, 60% for 1 month, and 78% for 15 days. EPA believes that an R factor of 5 is an adequate threshold to waive requirements for sites because they would not reasonably be expected to impair water quality.

EPA will develop, as part of the tool box described in section II.A.5, guidance materials and computer or web-accessible programs to assist permitting authorities and construction site discharges in determining if any resulting storm water discharges from specific projects are eligible for this waiver.

ii. Water Quality Waiver. The water quality waiver under § 122.26(b)(15)(i)(B) is available where storm water controls are not needed based on a comprehensive, location-specific evaluation of water quality needs. The waiver is available based on either an EPA-approved "total maximum daily load" (TMDL) under section 303(d) of the CWA that addresses the pollutant(s) of concern or, for sites discharging to non-impaired

waters that do not require TMDLs, an equivalent analysis that has either determined allocations for small construction sites for the pollutant(s) of concern or determined that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. The pollutants of concern that must be addressed include sediment or a parameter that addresses sediment (such as total suspended solids (TSS), turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. The operator must certify to the NPDES permitting authority that the construction activity will take place, and storm water discharges will occur, within the applicable drainage area evaluated in the TMDLs or equivalent analyses.

Today's rule modifies the approach in the proposed rule. EPA proposed to allow a waiver of permit requirements for small construction if storm water controls were determined to be unnecessary based on "wasteload allocations that are part of 'total maximum daily loads' (TMDLs) that address the pollutants of concern," or "a comprehensive watershed plan, implemented for the water body, that includes the equivalents of TMDLs, and addresses the pollutants of concern."

Commenters asked for clarification of the terms "comprehensive watershed plans" and "equivalent of TMDLs." EPA intended that both terms would include a comprehensive analysis that determines that controls on small construction sites are not needed based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. Today's rule makes this clarification.

One commenter pointed out that there are no water quality standards for suspended solids, the major pollutant expected in discharges from construction activity. The commenter asserted that no waiver would ever be available. Another commenter noted that there are no sediment criteria developed for streams, also making this waiver useless. EPA notes that a number of States and Tribes have water quality standards that address TSS, which are narrative in form, and that may serve as a basis for water quality-based effluent limits. As efforts to identify impairments and improve water quality progress, some States may yet develop water quality standards for suspended

solids. Although several TMDLs for sediment and related parameters have been established, EPA does recognize that currently it is extremely difficult to develop TMDLs for sediment. EPA is partially addressing this concern by clarifying in today's rule that the waivers may be based on a TMDL or equivalent analyses for sediment or one of the various pollutant parameters that are a proxy for sediment. These include TSS, turbidity and siltation.

Other commenters noted that this waiver was unattainable if a TMDL or equivalent analysis must be available for every pollutant that could possibly be present in any amount in discharges from small construction sites regardless of whether the pollutant is causing water quality impairment. Commenters asked that EPA identify what constitutes the "pollutants of concern" for which a TMDL or its equivalent must be developed. EPA has revised the proposed rule in response to these concerns.

In order for discharges from construction sites under five acres to qualify for the water quality waiver of today's rule, the construction site operator must demonstrate that storm water controls are not necessary for sediment or a parameter that addresses sediment (such as TSS, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Even if the water body is not currently impaired for sediment, today's rule requires an analysis of the potential impacts of sediment because the storm water discharges from the construction activity will be a new source of loading to the water body that could constitute a new impairment. Because the water body will not necessarily have been included on a "303(d) list" and a TMDL will not necessarily be required, the rule continues to allow an analysis that is the equivalent of a TMDL. The designation of storm water discharges from small construction activity for regulation in today's rule is intended to control pollutants other than sediment. This waiver provision requires a TMDL or equivalent analysis for a pollutant other than gross particulates (*i.e.*, sediment and other particulate-focused pollutant parameters) only if the receiving water is currently impaired for that pollutant.

One commenter expressed the concern that construction operators will not know if they are in a watershed covered by a TMDL. To the extent this is an operator's concern, he or she could contact their NPDES permitting

authority before applying for permit coverage to determine if receiving water is subject to a TMDL. Alternatively, the permitting authority could identify the TMDL (or equivalent analysis) areas in the general permit or another operator-accessible information source.

Another commenter expressed the concern that a TMDL waiver is likely to be ineffective because the TMDL list is submitted only once every 2 years. By the time a water is listed, the activity may have been completed and stabilized. The commenter argued that, if a watershed is impaired due to sediment from construction, then storm water controls will still be needed, because small construction can only be waived when it is not identified as a source of impairment. In response, EPA notes that an analysis that is the equivalent of a TMDL (specifically, equivalent to the component of a TMDL that comprehensively analyses existing ambient conditions against the applicable water quality standards) may also provide a basis for waiver from the default 1 acre designation. Also, even if a water has been identified as impaired for sediment, it is possible that a site or category of sites may receive an allocation that is sufficiently high enough to allow discharges without storm water controls.

c. Permit Process and Administration

The operator of the construction site, as with any operator of a point source discharge, is responsible for obtaining coverage under a NPDES permit as required by § 122.21(b). The “operator” of the construction site, as explained in the current NPDES construction general permit, is typically the party or parties that either individually or collectively meet the following two criteria: (1) Operational control over the site specifications, including the ability to make modifications in the specifications; and (2) day-to-day operational control of those activities at the site necessary to ensure compliance with permit conditions (63 FR 7859). If more than one party meets these criteria, then each party involved would typically be a co-permittee with any other operators. The operator could be the owner, the developer, the general contractor, or individual contractor. When responsibility for operational control is shared, all operators must apply.

In today’s rule, EPA is not requiring an NOI for NPDES general permits for storm water discharges from construction activities regulated by § 122.26(b)(15) if the NPDES permitting authority finds that the use of NOIs would be inappropriate (see

§ 122.28(b)(2)(v)). Under this approach, the NPDES permitting authority will have the discretion to decide whether or not to require NOIs for discharges from construction activity less than 5 acres. Compared to the existing storm water regulation, the permitting authority thus has increased flexibility in program implementation. EPA does recommend the use of NOIs, however because NOIs track permit coverage and provide a useful information source to prioritize inspections or enforcement. Requiring an NOI allows for greater accountability by, and tracking of, dischargers. This simple permit application and reporting mechanism also allows for better outreach to the regulated community, uses an existing and familiar mechanism, and is consistent with the existing requirements for storm water discharges from larger construction activities. Today’s rule does not amend the requirement for NOIs in general permits for storm water discharges from construction activity disturbing 5 acres or more. See § 122.28(b)(2)(v).

EPA expects that the vast majority of discharges of storm water associated with small construction activity identified in § 122.26(b)(15) will be regulated through general permits. In the event that an NPDES permitting authority decides to issue an individual construction permit, however, individual application requirements for these construction site discharges are found at § 122.26(c)(1)(ii). For any discharges of storm water associated with small construction activity identified in § 122.26(b)(15) that are not authorized by a general permit, a permit application made pursuant to § 122.26(c) must be submitted to the Director by 3 years and 90 days after publication of the final rule.

Some commenters expressed concern that linear construction projects (*e.g.*, roads, highways, pipelines) that cross several jurisdictions will have to comply with multiple sets of requirements from various jurisdictions, including multiple local governments and States. EPA is limited in its options to address these concerns because the Agency cannot issue NPDES permits in States authorized to implement the NPDES program nor preempt other more stringent local and State requirements. EPA believes, however, that the option for incorporating by reference the State, Tribal or local requirements (see discussion in Section II.I.2.d., Cross-Referencing State/Local Erosion and Sediment Control Programs) should limit the administrative burden on the operator responsible for discharges from linear construction projects. If the operator were to implement the most

comprehensive of the various requirements for the whole project, it could avoid confusion due to differing requirements for different sections of the project. In addition, linear utility projects, which usually have a shorter project period, are more likely to be eligible for the rainfall erosivity waiver.

One commenter stated there was no reason to delay the application period for regulated storm water discharges from small construction activities. The commenter requested that the newly regulated construction site discharges should be required to seek permit coverage within 90 days, as opposed to 3 years, of the effective date of the rule. The Agency does not accept this request. EPA anticipates that NPDES permitting authorities will need one to two years to develop adequate legal authority to implement a program to address this new category of discharges, as well as to develop and issue general permits. Moreover, to ensure effective implementation to protect water quality, regulatory authorities will need additional time to inform small construction site operators of requirements and provide guidance and training on these requirements.

Finally, EPA received a comment requesting that the three year file retention requirement be deleted for discharges from small construction sites. While EPA recognizes that the three year record retention schedule may be unnecessary for certain construction projects, the Agency has determined it is necessary to retain files after the completion of the project to ensure permit compliance, including applicable construction site stabilization enabling permit termination for such sites.

d. Cross-Referencing State, Tribal or Local Erosion and Sediment Control Programs

In developing the NPDES permit requirements for construction sites less than 5 acres, members of the Storm Water Phase II FACA Subcommittee asked EPA to try to minimize redundancy in the construction permit requirements. In response, today’s rule at § 122.44(s) provides for incorporation of qualifying State, Tribal or local erosion and sediment control program requirements by reference into the NPDES permit authorizing storm water discharges from construction sites (described under §§ 122.26(b)(15) and (b)(14)(x)). The incorporation by reference approach applies not only to the newly regulated storm water discharges (from construction activity disturbing between 1 and 5 acres, including designated sites, but

excluding waived sites) but also to discharges from construction activity disturbing 5 or more acres already covered by the existing storm water regulations. For this latter category of discharges from construction activity disturbing 5 or more acres, the incorporation by reference approach requires that the pollutant control requirements from the incorporated program also satisfy the statutory standard for limitations representing application of the best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT).

For permits issued for discharges from small construction activity defined under § 122.26(b)(15), a qualifying State, Tribal, or local erosion and sediment control program is one that includes the program elements described under § 122.44(s)(1). These elements include requirements for construction site operators to implement appropriate erosion and sediment control BMPs, requirements to control waste, a requirement to develop a storm water pollution prevention plan, and requirements to submit a site plan for review. A storm water pollution prevention plan includes site descriptions, descriptions of appropriate control measures, copies of approved State, Tribal or local requirements, maintenance procedures, inspection procedures, and identification of non-storm water discharges. The construction site's permit would require it to follow the requirements of the qualifying local program rather than require it to follow two different sets of requirements. If a partially-qualifying program does not have all of the elements described under § 122.44(s)(1), then the NPDES permitting authority may still incorporate language in the small construction site discharge's permit that requires the construction site operator to follow the program, but the construction site discharge permit also must incorporate the missing required elements in order to satisfy CWA requirements.

The term "local" refers to the geographic area of applicability, not the form of government that develops and administers the program. Thus, a qualifying federal erosion and control program, such as certain programs developed and administered by the federal Bureau of Land Management, could be a qualifying local program.

As a result of this provision, local requirements will, in effect, provide the substantive construction site erosion and sediment control requirements for the NPDES permit authorization. Therefore, by following one set of

erosion and sediment control requirements, construction site operators satisfy both local and NPDES permit requirements without duplicative effort. At the same time, noncompliance with the referenced local requirements will be considered noncompliance with the NPDES permit which is federally enforceable. The NPDES permitting authority will, of course, retain the discretion to decide whether to include the alternative requirements in the general permit. EPA believes that this approach will best balance the need for consideration of specific local requirements and local implementation with the need for federal and citizen oversight, and will extend supplemental NPDES requirements to control storm water discharges from construction sites.

EPA developed the "incorporation by reference" approach based on implementation efforts designed by the State of Michigan. Michigan relies on localities to develop substantive controls for storm water discharges associated with construction activities on a localized basis. Localities, however, are not required to do so. In areas where the local authority does not choose to participate, the State administers the sedimentation and erosion control requirements. The State agency, as the NPDES permitting authority, receives an NOI (termed "notice of coverage" by Michigan) under the general permit and tracks and exercises oversight, as appropriate, over the activity causing the storm water discharge. Michigan's goal under these procedures is to utilize the existing erosion and sediment control program infrastructure authorized under State law for storm water discharge regulation. (See U.S. Environmental Protection Agency, Office of Water, January 7, 1994, Memo: From Michael B. Cook, Director OWEC, to Water Management Division Directors, Regarding the "Approach Taken by Michigan to Regulate Storm Water Discharges from Construction Activities.")

Most commenters supported the general concept of incorporating by reference qualifying programs. Two commenters expressed concern that different local construction requirements will create an impossible regulatory scheme for builders who work in different localities. EPA believes that allowing States to incorporate qualifying programs by reference will minimize the differences for builders who work in different areas of the State. These differences already exist, however, not only for erosion and sediment controls, but also other aspects

of construction. In any event, the criteria for qualification for localized programs should provide a certain degree of standardization for various localities' requirements. EPA expects that the new rule for construction and post-construction BMPs being developed under CWA section 304(m) will also encourage standardization of local requirements. (See discussion of this new rulemaking in section II.D.1, Federal Role of this preamble).

Two commenters requested that an "incorporation by reference" should include permission, in writing, from the qualifying local program administrator because of a perceived extra burden on the referenced program. Any program requirements incorporated by reference in NPDES permits should already apply to construction site dischargers in the applicable area and therefore should not add any additional burden to the referenced program. EPA has left to the discretion of the permitting authority the decision on whether to seek permission from the qualifying program before cross-referencing it in an NPDES permit.

One commenter stated that a qualifying local program should require a SWPPP. The proposed rule defined the qualifying local program as a program that meets the minimum program requirements established in the proposed construction minimum control measure for small MS4s. To ensure consistency in the controls for storm water discharges between the larger, already regulated construction sites and the discharges from smaller sites that will be regulated as a result of today's rule, EPA has made a change to define a qualifying local program as one that includes the elements described in § 122.44(s)(1). Section 122.44(s)(1) requires the development and implementation of a storm water pollution prevention plan as a criterion for qualification of local programs for incorporation by reference. As noted above, if a qualifying program does not include all the elements in § 122.44(s)(1) then the permitting authority will need to specify the missing elements in order to rely on the incorporation by reference approach.

One commenter asked what happens in regard to the use of qualifying programs when a construction site operator is also the qualifying local program operator. The provision for incorporation by reference applies in this situation also. The local program operator will be required to comply with requirements it has established for others.

e. Alternative Approaches

EPA received a number of comments on alternative permitting approaches. Several commenters supported regulating discharges only from those construction sites within urbanized areas. Other commenters opposed this approach. EPA chose to address storm water discharges from construction sites located both within and outside urbanized areas because of the potential for adverse water quality impact from storm water discharges from smaller sites in all areas. Regulating only those sites within urbanized areas would have excluded a large number of potential contributors to water quality impairment and would not address large areas of new development occurring on the outer fringes of urbanized areas. In fact, designating only small construction discharges within urbanized areas might create a perverse incentive for building only outside urbanized areas. Such an incentive would be inconsistent with the Agency's intention behind designating to protect water quality. The Agency intends that designation to protect water quality in today's rule should be both remedial and preventive.

A number of commenters encouraged EPA to cover municipal construction activities under the small MS4 general permit, instead of issuing a separate NPDES construction permit to these municipal construction projects. Similarly, a number of commenters supported EPA giving industrial facilities the option of having storm water from construction activities on the site covered by the industrial storm water permit. Several other commenters found that combining multiple permit types under one general permit introduced a degree of complexity which was confusing to permittees. Permitting authorities have the option of combining MS4 and construction permits or industrial and construction permits, however, specific requirements for each would still need to be included in the permit issued. EPA agrees that this would probably result in a more complex and confusing permit compared to the existing component permits.

Several commenters supported an alternative for regulated small MS4s where a local qualified program alone, without an NPDES permit, is sufficient to enforce compliance with construction site discharge requirements. On the other hand, one commenter stated that linking the local construction erosion and sediment control program to the existing NPDES program for storm water from larger construction has driven improvements in many local programs.

Another commenter stated that the potential fines under the NPDES program will encourage compliance and will be much stronger than any fines a local program may have. EPA agrees that the NPDES program is the best approach to address water quality impacts from construction sites and provides benefits such as accountability and federal enforcement.

A number of commenters supported issuing one permit for each construction company, instead of a permit for each individual construction activity (also requested for storm water discharges from the larger, already regulated construction sites). Other commenters found that a 'licensing' program for construction site operators would have many problems, including identifying who to permit and tracking information on active sites. EPA is regulating only the storm water discharges associated with construction activity from small sites, not the construction activity itself. Separate NPDES permits (either individual or general permit coverage) for construction site discharges avoid potential problems in tracking sites and operator accountability. Section 122.28(b)(2)(v) gives permitting authorities the option to issue a general permit without requiring an NOI. If an NOI is not required for each activity, permitting authorities could pursue other options such as a company-wide NOI, license instead of an NOI, or another mechanism.

2. Other Sources

In the *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System Storm Water Program*, Report to Congress, March 1995, ("Report") submitted by EPA pursuant to CWA section 402(p)(5), EPA examined the remaining unregulated point sources of storm water for the potential to adversely affect water quality. Due to very limited national data on which to estimate pollutant loadings on the basis of discharge categories, the discussion of the extent of unregulated storm water discharges is limited to an analysis of the number and geographic distribution of the unregulated storm water discharges. Therefore, EPA is not designating any additional unregulated point sources of storm water on a nationwide, categorical basis. Instead, the remainder of the sources will be regulated based on case-by-case post-promulgation designations by the NPDES permitting authority.

EPA did, however, evaluate a variety of categories of discharges for potential designation in the Report. EPA's efforts to identify sources and categories of

unregulated storm water discharges for potential designation for regulation in today's rule started with an examination of approximately 7.7 million commercial, retail, industrial, and institutional facilities identified as "unregulated." In general, the distribution of these facilities follows the distribution of population, with a large percentage of facilities concentrated within urbanized areas (see page 4-35 of the Report). This examination resulted in identification of two general classes of facilities with the potential for discharging pollutants to waters of the United States through storm water point sources.

The first group (Group A) included sources that are very similar, or identical, to regulated "storm water discharges associated with industrial activity" but that were not included in the existing storm water regulations because EPA used SIC codes in defining the universe of regulated industrial activities. By relying on SIC codes, a classification system created to identify industries rather than environmental impacts from these industries discharges, some types of storm water discharges that might otherwise be considered "industrial" were not included in the existing NPDES storm water program. The second general class of facilities (Group B) was identified on the basis of potential for activities and pollutants that could contribute to storm water contamination.

EPA estimates that Group A has approximately 100,000 facilities. Discharges from facilities in this group, which may be of high priority due to their similarity to regulated storm water discharges from industrial facilities, include, for example, auxiliary facilities or secondary activities (e.g., maintenance of construction equipment and vehicles, local trucking for an unregulated facility such as a grocery store) and facilities intentionally omitted from existing storm water regulations (e.g., publicly owned treatment works with a design flow of less than 1 million gallons per day, landfills that have not received industrial waste).

Group B consists of nearly one million facilities. EPA organized Group B sources into 18 sectors for the purposes of the Report. The automobile service sector (e.g., gas/service stations, general automobile repair, new and used car dealerships, car and truck rental) makes up more than one-third of the total number of facilities identified in all 18 sectors.

EPA conducted a geographical analysis of the industrial and commercial facilities in Groups A and

B. The geographical analysis shows that the majority are located in urbanized areas (see Section 4.2.2, Geographic Extent of Facilities, in the Report). In general, about 61 percent of Group A facilities and 56 percent of Group B facilities are located in urbanized areas. The analysis also showed that nearly twice as many industrial facilities are found in all urbanized areas as are found in large and medium municipalities alone. Notable exceptions to this generalization included lawn/garden establishments, small unregulated animal feedlots, wholesale livestock, farm and garden machinery repair, bulk petroleum wholesale, farm supplies, lumber and building materials, agricultural chemical dealers, and petroleum pipelines, which can frequently be located in smaller municipalities or rural areas.

In identifying potential categories of sources for designation in today's notice, EPA considered designation of discharges from Group A and Group B facilities. EPA applied three criteria to each potential category in both groups to determine the need for designation: (1) The likelihood for exposure of pollutant sources included in that category, (2) whether such sources were adequately addressed by other environmental programs, and (3) whether sufficient data were available at this time on which to make a determination of potential adverse water quality impacts for the category of sources. As discussed previously, EPA searched for applicable nationwide data on the water quality impacts of such categories of facilities.

By application of the first criterion, the likelihood for exposure, EPA considered the nature of potential pollutant sources in exposed portions of such sites. As precipitation contacts industrial materials or activities, the resultant runoff is likely to mobilize and become contaminated by pollutants. As the size of these exposed areas increases, EPA expects a proportional increase in the pollutant loadings leaving the site. If EPA concluded that a category of sources has a high potential for exposure of raw materials, intermediate products, final products, waste materials, byproducts, industrial machinery, or industrial activity to rainfall, the Agency rated that category of sources as having "high" potential for adverse water quality impact. EPA's application of the first criterion showed that a number of Group A and B sources have a high likelihood of exposure of pollutants.

Through application of the second criterion, EPA assessed the likelihood

that pollutant sources are regulated in a comprehensive fashion under other environmental protection programs, such as programs under the Resource Conservation and Recovery Act (RCRA) or the Occupational Health and Safety Act (OSHA). If EPA concluded that the category of sources was sufficiently addressed under another program, the Agency rated that source category as having "low" potential for adverse water quality impact. Application of the second criterion showed that some categories were likely to be adequately addressed by other programs.

After application of the third criterion, availability of nationwide data on the various storm water discharge categories, EPA concluded that available data would not support any such nationwide designations. While such data could exist on a regional or local basis, EPA believes that permitting authorities should have flexibility to regulate only those categories of sources contributing to localized water quality impairments.

EPA received comments requesting designation of additional industrial, commercial and retail sources (*e.g.*, industrial activity "look-alikes", roads, commercial facilities and institutions, and vehicle maintenance facilities) in the final rule, because the commenters believe that the data exist to support national designation of some of these sources. Other comments were received opposing designation of any additional sources. Today's rule does not designate any additional industrial or commercial category of sources either because EPA currently lacks information indicating a consistent potential for adverse water quality impact or because of EPA's belief that the likelihood of adverse impacts on water quality is low, with some possible exceptions on a more local basis. Since the time the Agency submitted the Report, EPA has continued to seek additional data and has requested available data from the FACA members. If sufficient regional or nationwide data become available in the future, the permitting authority could at that time designate a category of sources or individual sources on a case-by-case basis. Therefore, today's rule encourages control of storm water discharges from Groups A and B through self-initiated, voluntary BMPs, unless the discharge (or category of discharges) is designated for permitting by the permitting authority. See discussion in section I.D., EPA's Reports to Congress.

3. ISTEA Sources

Provisions within the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991 temporarily

exempted storm water discharges associated with industrial activity that are owned or operated by municipalities serving populations less than 100,000 people (except for airports, power plants, and uncontrolled sanitary landfills) from the need to apply for or obtain a storm water discharge permit (section 1068(c) of ISTEA). Congress extended the NPDES permitting moratorium for these facilities to allow small municipalities additional time to comply with NPDES requirements for certain sources of industrial storm water. The August 7, 1995 storm water final rule (60 FR 40230) further extended this moratorium until August 7, 2001. However, today's rule changes this deadline so that previously exempted industrial facilities owned or operated by municipalities serving populations less than 100,000 people, must now submit an application for a permit within 3 years and 90 days from date of publication of today's rule.

EPA received comments recommending that permit requirements for municipally owned or operated industrial storm water discharges, including those previously exempt under ISTEA, be included in a single NPDES permit for all MS4 storm water discharges. The existing NPDES regulations already provide permitting authorities the ability to issue a single "combination" permit for MS4 discharges. However, if the permitting authorities chose to issue this type of permit, they must make sure that in doing so, they are not creating a double standard for industrial facilities covered under the combination permit versus those covered under separate general or individual permits. In order to avoid this double standard, combination permits would have to contain requirements that are the same or very similar to the requirements found in separate MS4 and industrial permits, *i.e.*, the minimum measures and other necessary requirements of an MS4 permit, and the SWPPP, monitoring and reporting requirements, and other necessary requirements of an industrial permit. If such a combined MS4 general permit were issued, the regulations require that each discharger submit NOIs for their respective discharges, except for discharges from small construction activities. Flexibility exists in developing a combination NOI which could reduce the need to submit duplicative information, *e.g.* owner/operator name and address. The combination NOI would still need to require specific information for each separate municipally owned or operated industrial location, including

construction projects disturbing 5 or more acres. The regulations at § 122.28(b)(2)(ii) list the necessary contents of an NOI, which require: the facility name, facility address, type of facility or discharge and receiving stream for each industrial discharge location. When viewed in its entirety, a combination permit, which by necessity would need to contain all elements of otherwise separate industrial and MS4 permit requirements, and require NOI information for each separate industrial activity, may have few advantages when compared to obtaining separate MS4 and industrial general permit coverage.

In order to allow the permitting authority to issue a single storm water permit for the MS4 and all municipally owned or operated industrial facilities, including those previously exempt under ISTEA, today's rule requires applications for ISTEA sources within 3 yrs and 90 days from date of publication of today's rule. The permitting authority has the ultimate decision to determine whether or not a single all-encompassing MS4 permit is appropriate.

4. Residual Designation Authority

The NPDES permitting authority's existing designation authority, as well as the petition provisions are being retained. Today's rule contains two provisions related to designation authority at §§ 122.26(a)(9)(i)(C) and (D). Subsection (C) adds designation authority where storm water controls are needed for the discharge based upon wasteload allocations that are part of TMDLs that address the pollutant(s) of concern. EPA intends that the NPDES permitting authority have discretion in the matter of designations based on TMDLs under subsection (C). Subsection (D) carries forward residual designation authority under former § 122.26(g), and has been modified to provide clarification on categorical designation. Under today's rule, EPA and authorized States continue to exercise the authority to designate remaining unregulated discharges composed entirely of storm water for regulation on a case-by-case basis (including § 123.35). Individual sources are subject to regulation if EPA or the State, as the case may be, determines that the storm water discharge from the source contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. This standard is based on the text of section CWA 402(p). In today's rule, EPA believes, as Congress did in drafting section CWA 402(p)(2)(E), that individual instances of storm water discharge might warrant

special regulatory attention, but do not fall neatly into a discrete, predetermined category. Today's rule preserves the regulatory authority to subsequently address a source (or category of sources) of storm water discharges of concern on a localized or regional basis. For example, as States and EPA implement TMDLs, permitting authorities may need to designate some point source discharges of storm water on a categorical basis either locally or regionally in order to assure progress toward compliance with water quality standards in the watershed.

EPA received comments asking that § 122.26(a)(9)(i)(D) as proposed be modified to include specific language clarifying the permitting authority's ability to designate additional sources on a categorical basis as explained in the preamble to the proposed rule. One comment requested that the designation language include "categories of sources on a Statewide basis." EPA agrees that the intent of the language may not have been clear regarding categorical designation. Today's rule modifies subsection (D) to clarify that the designation authority can be applied within different geographic areas to any single discharge (i.e., a specific facility), or category of discharges that are contributing to a violation of a water quality standard or are significant contributors of pollutants to waters of the United States. The added term "within a geographic area" allows "State-wide" or "watershed-wide" designation within the meaning of the terms.

One commenter questioned the Agency's legal authority to provide for such residual designation authority. The stakeholder argued that the lapse of the October 1, 1994, permitting moratorium under CWA section 402(p)(1) eliminated the significance of the CWA section 402(p)(2) exceptions to the moratorium, including the exception for discharges of storm water determined to be contributing to a violation of a water quality standard or a significant contributor of pollutants under CWA section 402(p)(2)(E). The stakeholder further argued that EPA's authority to designate sources for regulation under CWA section 402(p)(6) is limited to storm water discharges other than those described under CWA section 402(p)(2). Because CWA section 402(p)(2)(E) describes individually designated discharges, the stakeholder concluded that regulations under CWA section 402(p)(6) cannot provide for post-promulgation designation of individual sources. EPA disagrees.

First, as explained previously, EPA anticipates that NPDES permitting

authorities may yet determine that individual unregulated point sources of storm water discharges require regulation on a case-by-case basis. This conclusion is consistent with the Congress' recognition of the potential need for such designation under the first phase of storm water regulation as described in CWA section 402(p)(2)(E). Under CWA section 402(p)(2)(E), Congress recognized the need for both EPA and the State to retain authority to regulate unregulated point sources of storm water under the NPDES permit program. Second, to the extent that CWA section 402(p)(6) requires designation of a "category" of sources, the permitting authority may designate such (as yet unidentified) sources as a category that should be regulated to protect water quality. Though such sources may exist and discharge today, if neither EPA nor the State/Tribal NPDES permitting authority has designated the source for regulation under CWA section 402(p)(2)(E) to date, then CWA section 402(p)(6) provides the authority to designate such sources.

The Agency can designate a category of "not yet identified" sources to be regulated, based on local concerns, even if data do not exist to support nationwide regulation of such sources. EPA does not interpret the language in CWA section 402(p) to preclude States from exercising designation authority under these provisions because such designation (and subsequent regulation of designated sources) is within the "scope" of the NPDES program.

EPA also believes that sources regulated pursuant to a State designation are part of (and regulated under) a federally approved State NPDES program, and thus subject to enforcement under CWA sections 309 and 505. Under existing NPDES State program regulations, State programs that are "greater in scope of coverage" are not part of the federally-approved program. By contrast, any such State regulation of sources in this "reserved category" will be within the scope of the federal program because today's rule recognizes the need for such post promulgation designations of unregulated point sources of storm water. Such regulation will be "more stringent" than the federal program rather than "greater in scope of coverage" (40 CFR 123.1(h)).

EPA does not interpret the congressional direction in CWA section 402(p)(6) to preclude regulation of point sources of storm water that should be regulated to protect water quality. Under CWA section 510, Congress expressly recognized and preserved the authority of States to adopt and enforce

more stringent regulation of point sources, as well as any requirement respecting the control or abatement of pollution. Section 510 applies, "except as expressly provided" in the CWA. CWA section 502(14) does expressly provide affirmative limitations on the regulation of certain pollutant sources through the point source control program, the NPDES permitting program. Section 502(14) excludes agricultural storm water and return flows from irrigated agriculture from the definition of point source, and section 402(l) limits applicability of the section 402 permit program for return flows from irrigated agriculture, as well as for storm water runoff from certain oil, gas, and mining operations. Unlike sections 502(14) and 402(l), EPA does not interpret CWA section 402(p)(6) as an express provision limiting the authority to designate point sources of storm water for regulation on a case-by-case basis after the promulgation of final regulations. Any source of storm water discharge is encouraged to assess its potential for storm water contamination and take preventive measures against contamination. Such proactive actions could result in the avoidance of future regulation.

One comment was received requesting clarification of the term "non-municipal" in § 122.26(a)(9)(ii). The commenter is concerned that the term "non-municipal," in this context, implies that municipally owned or operated facilities cannot be designated. The term "non-municipal" in this context refers to the universe of unregulated industrial and commercial facilities that could potentially be designated according to § 122.26(a)(9)(i) authority. There is no exemption for municipally owned or operated facilities under these designation provisions.

Finally, EPA received comments and evaluated the proposal under which operators of regulated small, medium, and large MS4s would be responsible for controlling discharges from industrial and other facilities into their systems in lieu of requiring NPDES permit coverage for such facilities. EPA did not adopt this framework due to concerns with administrative and technical burden on the MS4 operators, as well as concerns about such an intergovernmental mandate.

J. Conditional Exclusion for "No Exposure" of Industrial Activities and Materials to Storm Water

1. Background

In 1992, the Ninth Circuit court remanded to EPA for further

rulemaking, a portion of the definition of "storm water discharge associated with industrial activity" that excluded the category of industrial activity identified as "light industry" when industrial materials and/or activities were not exposed to storm water. See *NRDC v. EPA*, 966 F.2d 1292, 1305 (9th Cir. 1992). Today's final rule responds to that remand. In the 1990 storm water regulations, EPA excluded the light industry category from the requirement for an NPDES permit if the industrial materials and/or activities were not "exposed" to storm water (see § 122.26(b)(14)). The Agency had reasoned that most of the activity at these types of facilities takes place indoors and that emissions from stacks, use of unboxed manufacturing equipment, outside material storage or disposal, and generation of large amounts of dust or particles would be atypical (55 FR 48008, November 16, 1990).

The Ninth Circuit determined that the exemption was arbitrary and capricious for two reasons. First, the court found that EPA had not established a record to support its assumption that light industry that was not exposed to storm water was not "associated with industrial activity," particularly when other types of industrial activity not exposed to storm water remained "associated with industrial activity." The court specifically found that "[t]o exempt these industries from the normal permitting process based on an unsubstantiated assumption about this group of facilities is arbitrary and capricious." Second, the court concluded that the exemption impermissibly "altered the statutory scheme" for permitting because the exemption relied on the unverified judgment of the light industrial facility operator to determine non-applicability of the permit application requirements. In other words, the court was critical that the operator would determine for itself that there was "no exposure" and then simply not apply for a permit without any further action. Without a basis for ensuring the effective operation of the permitting scheme—either that facilities would self-report actual exposure or that EPA would be required to inspect and monitor such facilities—the court vacated and remanded the rule to EPA for further rulemaking.

One of the major concerns expressed by the FACA Committee, was that EPA streamline and reinvent certain troublesome or problematic aspects of the existing permitting program for storm water discharges. One area identified was the mandatory applicability of the permitting program

to all industrial facilities, even those "light industrial" activities that are of very low risk or of no risk to storm water contamination. Such dischargers may not have any industrial sources of storm water contamination on the plant site, yet they are still required to apply for an NPDES storm water permit and meet all permitting requirements. Examples of such facilities are a soap manufacturing plant (SIC Code 28) or hazardous waste treatment and disposal facility, where all industrial activities, even loading docks, are inside a building or under a roof.

Although they did not provide a written report, the FACA Committee members advised EPA that the existing storm water program should be revised to allow such facilities to seek an exclusion from the NPDES storm water permitting requirements. The Committee agreed that such an exclusion should also provide a strong incentive for other industrial facilities that conduct industrial activities outdoors to move the activities under cover or into buildings to prevent contamination of rainfall and storm water runoff. The committee believed that such a "no exposure" permit exclusion could be a valuable incentive for storm water pollution prevention.

In today's final rule, the Agency responds to both of the bases for the court's remand. The exclusion from permitting based on "no exposure" applies to all industrial categories listed in the existing storm water regulations except construction. The court's opinion rejected EPA's distinction between light industry and other industry, but it did not preclude an interpretation that treats all "non-exposed" industrial facilities in the same fashion. Presuming that an industrial facility adequately prevents exposure of industrial materials and activities to storm water, today's rule treats discharges from "non-exposed" industrial facilities in a manner similar to the way Congress intended for discharges from administrative buildings and parking lots. Specifically, permits will not be required for storm water discharges from these facilities on a categorical basis.

To assure that discharges from industrial facilities really are similar to discharges from administrative buildings and parking lots, and to respond to the second basis for the court's remand, the permitting exclusion is "conditional". The person responsible for a point source discharge from a "no exposure" industrial source must meet the conditions of the exclusion, and complete, sign and submit the certification to the permitting authority for tracking and

accountability purposes. EPA believes today's rule, therefore, is fully consistent with the direction provided by the court.

EPA relied upon the "no exposure" concept discussed by the FACA Committee in developing the "no exposure" provisions of today's rule. EPA is deleting the sentence regarding "no exposure" for the facilities in § 122.26(b)(14)(xi) and adding a new § 122.26(g) titled "Conditional Exclusion for No Exposure of Industrial Activities to Storm Water." The "no exposure" provision will make storm water discharges from all classes of industrial facilities eligible for exclusion, except storm water discharges from regulated construction activities. Regulated construction activities cannot claim "no exposure" because the main pollutants of concern (e.g., sediment) generally cannot entirely be sheltered from storm water.

Today's rule represents a significant expansion in the scope of the "no exposure" provision originally promulgated in the 1990 rule, which was only for storm water discharges from light industry. The intent of today's "no exposure" provision is to provide a simplified method for complying with the CWA to all industrial facilities that are entirely indoors. This includes facilities that are located within a large office building, or at which the only items permanently exposed to precipitation are roofs, parking lots, vegetated areas, and other non-industrial areas or activities.

EPA received several comments related to storm water runoff from parking lots, roof tops, lawns, and other non-industrial areas of an industrial facility. Storm water discharges from these areas, which may contain pollutants or which may result in additional storm water flows, are not directly regulated under the existing storm water permitting program because they are not "storm water discharges associated with industrial activity". Many comments on this issue supported maintaining the exclusion from the existing regulations for storm water permitting for discharges from administrative buildings, parking lots, and other non-industrial areas. Other comments opposed allowing the continued exclusion for discharges from non-industrial areas of the site because discharges from these areas are potentially a significant cause of receiving water impairment. These comments urged that such discharges should not be excluded from NPDES permit coverage. Today's rule does not require permit coverage for discharges from a facility's exposed areas that are

separate from industrial activities such as runoff from office buildings and accompanying parking lots, lawns and other non-industrial areas. This approach is consistent with the existing storm water rules which were based on Congress's intent to exclude non-industrial areas such as "parking lots and administrative and employee buildings." 133 Cong. Rec. 985 (1987). EPA also lacks data indicating that discharges from these areas at an industrial facility cause significant receiving water impairments. Therefore, the non-industrial areas at a facility do not need to be assessed as part of the "no exposure" certification.

EPA received comments related to industrial facilities that achieve "no exposure" by constructing large amounts of impervious surfaces, such as roofs, where previously there were pervious or porous surfaces into which storm water could infiltrate. Some commenters made the point that large amounts of impervious area may cause a significant increase in storm water volume flowing off the industrial facility, and thus may cause adverse receiving water impacts simply due to the increased quantity of storm water flow. Some commenters said that storm water discharges from impervious areas at an industrial facility are generally more frequent, and often larger, than discharges from the pre-existing natural surfaces. They believe that these discharges will contain pollutants typical of commercial areas and roads and are an equal threat to direct human uses of the water and can cause equal damage to aquatic life and its habitat. Other commenters believe that if Congress or EPA addresses the issue of flow, it should be addressed on a broader scale than merely through the "no exposure" exclusion, and that EPA has no authority under any existing legal framework to regulate flow directly. Some commenters stated that developing federal parameters for the control of water quantity, *i.e.* flow, would result in federal intrusion into land use planning, an authority that they claim is solely within the purview of State governments and their political subdivisions.

EPA is not attempting to regulate flow via the "no exposure" provisions. EPA does agree, however, that increases in impervious surfaces can result in increased runoff volumes from the site which in turn may increase pollutant loading. In addition, the Agency notes that in some States water quality standards include water quality criteria for flow or turbidity. Therefore, in order to provide a minimal amount of information on possible impacts from

increased pollutant loading and runoff volume, EPA's "no exposure" certification form (see Appendix 4) asks the discharger to indicate if they have paved or roofed over a formerly exposed, pervious area in order to qualify for the "no exposure" exclusion. If the answer is yes, the discharger must indicate, by choosing from three possible responses, approximately how much impervious area was created to achieve "no exposure". The choices are: (1) less than 1 acre, (2) 1 to 5 acres, and (3) more than 5 acres. This requirement provides additional information that will aid in determining if discharges from the facility are causing adverse receiving water impacts. EPA intends to prevent water quality impacts resulting from increased discharges of pollutants, which may result from increased volume of runoff. In many cases, consideration of the increased flow rate, velocity and energy of storm water discharges, following construction of large amounts of impervious surfaces, must be taken into consideration in order to reduce the discharge of pollutants, to meet water quality standards and to prevent degradation of receiving streams. EPA recommends that dischargers consider these factors when making modifications to their site in order to qualify for the "no exposure" exclusion.

2. Today's Rule

In order to claim relief under the "no exposure" provision, the discharger of an otherwise regulated facility must submit a no exposure certification that incorporates the questions of § 122.26(g)(4)(iii) to the NPDES permitting authority once every 5 years. This provision applies across all categories of industrial activity covered by the existing program, except discharges from construction activities.

In addition to submitting a "no exposure" certification every 5 years, the facility must allow the NPDES permitting authority or operator of an MS4 (where there is a storm water discharge to the MS4) to inspect the facility and to make such inspection reports publicly available upon request. Also, upon request, the facility must submit a copy of the "no exposure" certification to the operator of the MS4 into which the facility discharges (if applicable). All "no exposure" certifications must be signed in accordance with the signatory requirements of § 122.22. The "no exposure" certification is non-transferable. In the event that the facility operator changes, the new discharger must submit a new "no exposure" certification.

Members of the FACA Committee urged that EPA not allow dischargers certifying "no exposure" to take actions to qualify for this provision that result in a net environmental detriment. In developing a regulatory implementation mechanism, however, EPA found that the phrase "no net environmental detriment," was too imprecise to use within this context. Therefore, today's rule addresses this issue by requiring information that should help the permitting authority to determine whether actions taken to qualify for the exclusion interfere with the attainment or maintenance of water quality standards, including designated uses. Permitting authorities will be able, where necessary, to make a determination by evaluating the activities that changed at the industrial site to achieve "no exposure", and assess whether these changes cause an adverse impact on, or have the reasonable potential to cause an instream excursion of, water quality standards, including designated uses. EPA anticipates that many efforts to achieve "no exposure" will employ simple good housekeeping and contaminant cleanup activities. Other efforts may involve moving materials and industrial activities indoors into existing buildings or structures.

In very limited cases, industrial operators may make major changes at a site to achieve "no exposure". These efforts may include constructing a new building or cover to eliminate exposure or constructing structures to prevent run-on and storm water contact with industrial materials or activities. Where major changes to achieve "no exposure" increase the impervious area of the site, the facility operator must provide this information on the "no exposure" certification form as discussed above. Using this and other available data and information, permitting authorities should be able to assess whether any major change has resulted in increased pollutant concentrations or loadings, toxicity of the storm water runoff, or a change in natural hydrological patterns that would interfere with the attainment and maintenance of water quality standards, including designated uses or appropriate narrative, chemical, biological, or habitat criteria where such State or Tribal water quality standards exist. In these instances, the facility operator and their NPDES permitting authority should take appropriate actions to ensure that attainment or maintenance of water quality standards can be achieved. The NPDES permitting authority should decide if the facility must obtain coverage under an

individual or general permit to ensure that appropriate actions are taken to address adverse water quality impacts.

While the intent of today's "no exposure" provision is to reduce the regulatory burdens on industrial facilities and government agencies, the FACA Committee suggested that the NPDES permitting authority consider a compliance assessment program to ensure that facilities that have availed themselves of this "no exposure" option meet the applicable requirements. Inspections could be conducted at the discretion of the NPDES authority and be coordinated with other facility inspections. EPA expects, however, that the permitting authority will conduct inspections when it becomes aware of potential water quality impacts possibly caused by the facility's storm water discharges or when requested to do so by adversely affected members of the public. The intent of this provision is that the 5 year "no exposure" certification be fully available to, and enforceable by, appropriate federal and State authorities under the CWA. Private citizens can enforce against facilities for discharges of storm water that are inconsistent with a "no exposure" certification if storm water discharges from such facilities are not otherwise permitted and in compliance with applicable requirements.

EPA received comments from owners, operators and representatives of Phase I facilities classified as "light industry" as defined by the regulations at § 122.26(b)(14)(xi). The comments recommended maintaining the approach of the existing regulations which does not require the discharger to submit any supporting documentation to the permitting authority in order to claim the "no exposure" exclusion from permitting. As discussed previously, the "no exposure" concept was developed in response to the Ninth Circuit court's remand of part of the existing rules back to EPA. The court found that EPA cannot rely on the "unverified judgment" of the facility. The comments opposing documentation did not address the "unverified judgment" concern.

Today's rule is a "conditional" exclusion from permitting which requires all categories, including the "light industrial" facilities that have no exposure of materials to storm water, to submit a certification to the permitting authority. Upon receipt of a complete certification, the permitting authority can review the information, or call, or inspect the facility if there are doubts about the facility's "no exposure" claim. Also, if the facility discharges into an MS4, the operator of the MS4 can

request a copy of the certification, and can inspect the facility. The public can request a copy of the certification and/or inspection reports. In adopting these conditional "no exposure" provisions, the Agency addressed the Ninth Circuit court's ruling regarding the discharger's unverified judgment.

EPA received one comment requesting clarification on whether the anti-backsliding provisions in the regulations at § 122.44(l) apply to industrial facilities that are currently covered under an NPDES storm water permit, and whether such facilities could qualify for the "no exposure" exclusion under today's rule. The anti-backsliding provisions will not prevent most industrial facilities that can certify "no exposure" under today's rule from qualifying for an exclusion from permitting. The anti-backsliding provisions contain 5 exceptions that allow permits to be renewed, reissued or modified with less stringent conditions. One exception at § 122.44(l)(2)(A) allows less stringent conditions if "material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation." Section 122.44(l)(B)(1) also allows less stringent requirements if "information is available which was not available at the time of permit issuance and which would have justified the application of less stringent effluent limitations at the time of permit issuance." Facility's operators who certify "no exposure" and submit the required information once every 5 years will have provided the permitting authority "information that was not available at the time of permit issuance." Also, some facilities may, in order to achieve "no exposure", make "material and substantial alterations or additions to the permitted facility." Therefore, most facilities covered under existing NPDES general permits for storm water (e.g., EPA's Multi-Sector General Permit) will be eligible for the conditional "no exposure" exclusion from permitting without concern about the anti-backsliding provisions. Such dischargers will have met one or both of the anti-backsliding exceptions detailed above. Facilities that are covered under individual permits containing numeric limitations for storm water should consult with their permitting authority to determine whether the anti-backsliding provisions will prevent them from qualifying for the exclusion from permitting (for that discharge point) based on a certification of "no exposure".

EPA received several comments regarding the timing of when the “no exposure” certification should be submitted. The proposed rule said that the “no exposure” certification notice must be submitted “at the beginning of each permit term or prior to commencing discharges during a permit term.” Some commenters interpreted this statement to mean that existing facilities can only submit the certification at the time a permit is being issued or renewed. EPA intended the phrase “at the beginning of each permit term” to mean “once every 5 years” and today’s rule reflects this clarification. EPA envisions that the NPDES storm water program will be implemented primarily through general permits which are issued for a 5 year term. Likewise the “no exposure” certification term is 5 years. The NPDES permitting authority will maintain a simple registration list that should impose only a minor administrative burden on the permitting authority. The registration list will allow for tracking of industrial facilities claiming the exclusion. This change allows a facility to submit a “no exposure” certification at any time during the term of the permit, provided that a new certification is submitted every 5 years from the time it is first submitted (assuming that the facility maintains a “no exposure” status). Once a discharger has established that the facility meets the definition of “no exposure”, and submits the necessary “no exposure” certification, the discharger must maintain their “no exposure” status. Failure to maintain “no exposure” at their facility could result in the unauthorized discharge of pollutants to waters of the United States and enforcement for violation of the CWA. Where a discharger believes that exposure could occur in the future due to some anticipated change at the facility, the discharger should submit an application and obtain coverage under an NPDES permit prior to such discharge to avoid penalties.

Where EPA is the permitting authority, dischargers may submit a “no exposure” certification at any time after the effective date of today’s rule. Where EPA is not the permitting authority, dischargers may not be able to submit the certification until the non-federal permitting authority completes any necessary statutory or regulatory changes to adopt this “no exposure” provision. EPA recommends that the discharger contact the permitting authority for guidance on when the “no exposure” certification should be submitted.

EPA received comments on the proposed rule requirement that the

discharger “must comply immediately with all the requirements of the storm water program including applying for and obtaining coverage under an NPDES permit,” if changes occur at the facility which cause exposure of industrial activities or materials to storm water. The comments expressed the difficulty of immediate compliance. EPA expects that most facility changes can be anticipated, therefore dischargers should apply for and obtain NPDES permit coverage in advance of changes that result in exposure to industrial activities or materials. Permitting authorities may grant additional time, on a case-by-case basis, for preparation and implementation of a storm water pollution prevention plan.

Finally, today’s rule at § 122.26(g)(4) includes the information which must be included on the “no exposure” certification. Authorized States, Tribes or U.S. Territories may develop their own form which includes this required information, at a minimum. EPA adopted the requirements (with modification) from the draft “No Exposure Certification Form” published as an appendix to the proposed rule. Modifications were made to the draft form to address comments received and to streamline the required information. EPA included these certification requirements in today’s rule in order to preserve its integrity. Dischargers in areas where EPA is the permitting authority should use the “No Exposure Certification” form included in Appendix 4.

3. Definition of “No Exposure”

For purposes of this section, “no exposure” means that all industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. However, storm resistant shelter is not required for: (1) Drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak; (2) adequately maintained vehicles used in material handling; and (3) final products, other than products that would be mobilized in storm water discharge (e.g., rock salt). Each of these three exceptions to the no exposure

definition are discussed in more detail below.

EPA intends the term “storm resistant shelter” to include completely roofed and walled buildings or structures, as well as structures with only a top cover but no side coverings, provided material under the structure is not otherwise subject to any run-on and subsequent runoff of storm water. While the Agency intends that this provision promote permanent “no exposure”, EPA understands that certain vehicles could pass between buildings and, during passage, be exposed to rain and snow. Adequately maintained vehicles such as trucks, automobiles, forklifts, or other such general purpose vehicles at the industrial site that are not industrial machinery, and that are not leaking contaminants or are not otherwise a source of industrial pollutants, could be exposed to precipitation or runoff. Such activities alone does not prevent a discharger from being able to certify no exposure under this provision. Similarly, trucks or other vehicles awaiting maintenance at vehicle maintenance facilities, as defined at § 122.26(b)(14)(viii), that are not leaking contaminants or are not otherwise a source of industrial pollutants, are not considered exposed.

In addition, EPA recognizes that there are circumstances where permanent “no exposure” of industrial activities or materials is not possible. Under such conditions, materials and activities may be sheltered with temporary covers, such as tarps, between periods of permanent enclosure. The final rule does not specify every such situation. EPA intends that permitting authorities will address this issue on a case-by-case basis. Permitting authorities can determine the circumstances under which temporary structures will or will not meet the requirements of this section. Until permitting authorities specifically determine otherwise, EPA recommends application of the “no exposure” exclusion for temporary sheltering of industrial materials or activities only during facility renovation or construction, provided that the temporary shelter achieves the intent of this section. Moreover, “exposure” that results from a leak in protective covering would only be considered “exposure” if not corrected prior to the next storm water discharge event. EPA received one comment requesting that this allowance for temporary shelter be limited to facility renovation or construction directly related to the industrial activity requiring temporary shelter, and be scheduled to minimize the use of temporary shelter. Another comment suggested placing time limits

on the use of temporary shelter. The commenter did not recommend a specific time period, rather the comment said that renovation in some instances may take years, and that EPA should not allow temporary shelter over prolonged periods. EPA agrees that the use of temporary shelter must be related to the renovation or construction at the site, and be scheduled or designed to minimize the use of temporary shelter. Further, EPA agrees that the use of temporary shelter should be limited in duration, but does not intend to define "temporary" or "prolonged period".

Many final products are intended for outdoor use and pose little risk of storm water contamination, such as new cars. Therefore, final products, except those that can be mobilized in storm water discharge, can be "exposed" and still allow the discharge to certify "no exposure". EPA intends the term "final products" to mean those products that are not used in producing another product. Any product that can be used to make another product is considered an "intermediate product." For example, a facility that makes horse trailers can store the finished trailers outdoors as a final product. The storage of those final products does not prevent eligibility to claim "no exposure". However, any facility that makes parts for the horse trailers (e.g., metal tubing, sheet metal, paint) is not eligible for the "no exposure" exclusion from permitting if those "intermediate products" are stored outdoors (i.e., "exposed").

EPA received comments related to materials in drums, barrels, tanks and similar containers. Some comments objected to the language in the preamble to the proposed rule that would have recommended that the "exposure" determination for drums and barrels be based on the "potential to leak." Those comments said that all drums and barrels have the potential to leak, thereby making certification impossible. They recommended allowing outdoor storage of drums and barrels except for those that "are leaking" at the time of certification. Other comments suggested allowing drums and barrels to be stored outside only if the drums and barrels: are empty; have secondary containment; or there is a spill contingency plan in place. Opposing comments suggested that allowing outdoor exposure of drums and barrels, based on existing integrity and condition, is inconsistent with the "however packaged" proposed rule language, and also would not satisfy the Ninth Circuit remand. The comments point out that the former rule was invalidated by the court in part because it relied on the "unverified

judgment" of the light industrial facility operator to determine the non-applicability of the permit requirements, and that allowing the facility operator to determine the condition of their drums and barrels would result in the same flaw.

In response, EPA believes that drums and barrels that are stored outdoors pose little risk of storm water contamination unless they are open, deteriorated or leaking. The Agency has modified today's rule accordingly. EPA intends the term "open" to mean any container that is not tightly sealed and "sealed" to mean banded or otherwise secured and without operational taps or valves. Drums, barrels, tanks, and similar containers may only be stored outdoors under this conditional exclusion. The addition of material to or withdrawing of material from these containers while outside is deemed "exposure". Moving the containers while outside does not create "exposure" provided that the containers are not open, deteriorated or leaking. In order to complete the "no exposure" certification, a facility operator must inspect all drums, barrels, tanks or other containers stored outside to ensure that they are not open, deteriorated, or leaking. EPA recommends that the discharger designate someone at the facility to conduct frequent inspections to verify that the drums, barrels, tanks or other containers remain in a condition such that they are not open, deteriorated or leaking. Drums, barrels, tanks or other containers stored outside that have valves which are used to put material in or take material out of the container, and that have dripped or may drip, are considered to be "leaking" and must be under a storm resistant shelter in order to qualify for the no exposure exclusion. Likewise, leaking pipes containing contaminants exposed to storm water are deemed "exposed." If at any time drums, barrels, tanks or similar containers are opened, deteriorated or leaking, the discharger should take immediate actions to close or replace the container. Any resulting unpermitted discharge would violate the CWA. The Director, the operator of the MS4, or the municipality may inspect the facility to verify that all of the applicable areas meet the "no exposure" conditions as specified in the rule language. In requiring submission of the conditional "no exposure" certification and allowing the permitting authority and the operator of the MS4 to inspect the facility, today's rule does not rely on the unverified judgment of the facility to determine that the no exposure provision is being met.

EPA received several comments related to trash dumpsters that are located outside. The preamble to the proposed rule listed dumpsters in the same grouping as drums and barrels, which based exposure on the "potential to leak". Today's rule distinguishes between dumpsters and drums/barrels. In the Phase I Question and Answer document (volume 1, question 52) the Agency noted that a covered dumpster containing waste material that is kept outside is not considered "exposed" as long as "the container is completely covered and nothing can drain out holes in the bottom, or is lost in loading onto a garbage truck." EPA affirms this approach today. Industrial refuse and industrial trash that is left uncovered is deemed "exposed."

For purposes of this provision, particulate matter emissions from roof stacks/vents that are regulated and in compliance under other environmental protection programs, such as air quality control programs, and that do not cause storm water contamination, are considered "not exposed." EPA received comments on the phrase in the draft "no exposure" certification form that asked whether "particulate emissions from roof stacks/vents not otherwise regulated, and in quantities detectable in the storm water outflow," are exposed to precipitation. One comment expressed concern that the phrase "in quantities detectable in the storm water outflow" implies that the facility must conduct monitoring prior to completing the checklist, and must continue to monitor after receiving the no exposure exclusion, in order to be able to verify compliance with the no exposure provision. Another comment said that current measurement technology allows detection of pollutants at levels that may not cause environmental harm. EPA does not intend to require monitoring of runoff from facilities with roof stacks/vents prior to or after completing and submitting the no exposure certification. EPA has thus replaced the phrase "in quantities detectable" with "evident" to convey the message that emissions from some roof stacks/vents have the potential to contaminate storm water discharges in quantities that are considered significant or that cause or contribute to a water quality standards violation. In those instances where the permitting authority determines that particulate emissions from facility roof stacks/vents are a significant contributor of pollutants or contributing to water quality violations, the permitting authority may require the discharger to apply for and obtain coverage under a

permit. Visible deposits of residuals (e.g., particulate matter) near roof or side vents are considered "exposed". Likewise, visible "track out" (i.e., pollutants carried on the tires of vehicles) or windblown raw materials are deemed "exposed."

EPA received a comment requesting an allowance under the "no exposure" provision for industrial facilities with several outfalls at a site where some, but not all of the outfalls drain non-exposed areas. The commenter provided an example of an industrial facility that has 5 outfalls draining different areas of the site, where two of those outfalls drain areas where industrial activities or materials are not exposed to storm water. The comment requested that the facility in this example be allowed to submit a "no exposure" certification in order to be relieved of permitting obligations for discharges from those two outfalls.

EPA agrees, but the comment would be implemented on an outfall-by-outfall basis in the permitting process, not through the "no exposure" exclusion. The "no exposure" provision was developed to allow exclusion from permitting of discharges from entire industrial facilities (except construction), based on a claim of "no exposure" for all areas of the facility where industrial materials or activities occur. Where exposure to industrial materials or activities exist at some but not all areas of the facility, the "no exposure" exclusion from permitting is not allowed because permit coverage is still required for storm water discharges from the exposed areas. Relief from permit requirements for outfalls draining non-exposed areas should be addressed through the permit process, in coordination with the permitting authority. Most NPDES general permits for storm water discharge provide enough flexibility to allow minimal or no requirements for non-exposed areas at industrial facilities. If the permitting authority determines that additional flexibility is needed for this scenario, the permits could be modified as necessary.

K. Public Involvement/Public Role

The Phase II FACA Subcommittee discussed the appropriate role of the public in successful implementation of a municipal storm water program. EPA believes that an educated and actively involved public is essential to a successful municipal storm water program. An educated public increases program compliance from residents and businesses as they realize their individual and collective responsibility for protecting water resources (e.g., the

residents and businesses could be subject to a local ordinance that prohibits dumping used oil down storm sewers). Finally, the program is also more likely to receive public support and participation when the public is actively involved from the program's inception and allowed to participate in the decision making process.

In a time of limited staff and financial resources, public volunteers offer diverse backgrounds and expertise that may be used to plan, develop, and implement a program that is tailored to local needs (e.g., participate in public meetings and other opportunities for input, perform lawful volunteer monitoring, assist in program coordination with other preexisting and related programs, aid in the development and distribution of educational materials, and provide public training activities). The public's participation is also useful in the areas of information dissemination/education and reporting of violators, where large numbers of community members can be more effective than a few regulators.

The public can also petition the NPDES permitting authority to require an NPDES permit for a discharge composed entirely of storm water that contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. In evaluating such a petition, the NPDES permitting authority is encouraged to consider the set of designation criteria developed for the evaluation of small MS4s located outside of an urbanized area in places with a population of at least 10,000 and a population density of 1,000 or more. Furthermore, any person can protect water bodies by taking civil action under section 505 of the CWA against any person who is alleged to be in violation of an effluent standard or permit condition. If civil action is taken, EPA encourages citizen plaintiffs to resolve any disagreements or concerns directly with the parties involved, either informally or through any available alternative dispute resolution process.

EPA recognizes that public involvement and participation pose challenges. It requires a substantial initial investment of staff and financial resources, which could be very limited. Even with this investment, the public might not be interested in participating. In addition, public participation could slow down the decision making process. However, the benefits are numerous.

EPA encourages members of the public to contact the NPDES permitting authority or local MS4s operator for information on the municipal storm water program and ways to participate.

Such information may also be available from local environmental, nonprofit and industry groups.

Some commenters stressed the need to suggest to the public that they have a responsibility to fund the municipal storm water program. While EPA believes it is important that the program be adequately funded, today's rule does not address appropriate mechanisms or levels for such funding.

EPA received comments expressing concern that considerable public involvement requirements could result in increased litigation. EPA is not convinced there is a correlation between meaningful public education programs and any increased probability of litigation.

Finally, EPA received comments stating that the Agency should not encourage volunteer monitoring unless proper procedures are followed. EPA agrees. EPA encourages only lawful monitoring, i.e., obtaining the necessary approval if there is any question about lawful access to sites. Moreover, as a matter of good practice and to enhance the validity and usefulness of the results, any party, public or private, conducting water quality monitoring is encouraged to use appropriate quality control procedures and approved sampling and analytic methods.

L. Water Quality Issues

1. Water Quality Based Effluent Limits

In addition to technology based requirements, all point source discharges of industrial storm water are subject to more stringent NPDES permitting requirements when necessary to meet water quality standards. CWA sections 402(p)(3)(A) and 301(b)(1)(C). For municipal separate storm sewers, EPA or the State may determine that other permit provisions (e.g. one of the minimum measures) are appropriate to protect water quality and, for discharges to impaired waters, to achieve reasonable further progress toward attainment of water quality standards pending implementation of a TMDL. CWA section 402(p)(3)(B)(iii). See *Defenders of Wildlife, et al. Browner*, No. 98-71080 (9th cir., August 11, 1999). Discharges of storm water also must comply with applicable antidegradation policies and implementation methods to maintain and protect water quality. 40 CFR 131.12. Section 122.34(a) emphasizes this point by specifically noting that a storm water management program designed to reduce the discharge of pollutants from the storm sewer system "to the maximum extent practicable" is also designed to protect water quality.

Permits issued to non-municipal sources of storm water must include water quality-based effluent limits where necessary to meet water quality standards.

Commenters challenged EPA's interpretation of the CWA as requiring water quality-based effluent limits for MS4s when necessary to protect water quality. Commenters asserted that CWA 402(p)(3)(B), which addresses permit requirements for municipal discharges, limits the scope of municipal program requirements to an effective prohibition on non-storm water discharges to a separate storm sewer and to controls which reduce pollutants to the "maximum extent practicable, including management practices, control techniques and system design and engineering methods." They asserted that the final rule should clarify that neither numeric nor narrative water quality-based limits are appropriate or authorized for MS4s.

EPA disagrees that section 402(p)(3) divests permitting authorities of the tools necessary to issue permits to meet water quality standards. Section 402(p)(3)(B)(iii) specifically preserves the authority for EPA or the State to include other provisions determined appropriate to reduce pollutants in order to protect water quality. *Defenders of Wildlife*, slip op. at 11688. Small MS4s regulated under today's rule are designated under CWA 402(p)(6) "to protect water quality."

Commenters argued that water quality standards, particularly numeric criteria, were not designed to address storm water discharges. The episodic nature and magnitude of storm water events, they argue, make it impossible to apply the "end of pipe" compliance assessment approach, for example, in the development of water quality based effluent limits.

EPA's disagrees with the commenters arguments about the inability of water quality criteria to address high flow conditions. Today's final rule does, however, address the concern that numeric effluent limits will necessitate end of pipe treatment and the need to provide a workable alternative.

Today's rule was developed under the approach outlined in the Interim Permitting Policy for Water Quality-Based Effluent Limitations in Storm Water Permits, issued on August 1, 1996. 61 FR 43761 (November 26, 1996) (the "Interim Permitting Policy"). EPA intends to issue NPDES permits consistent with the Interim Permitting Policy, which provides as follows:

In response to recent questions regarding the type of water quality-based effluent limitations that are most

appropriate for NPDES storm water permits, EPA is adopting an interim permitting approach for regulating wet weather storm water discharges. Due to the nature of storm water discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA will use an interim permitting approach for NPDES storm water permits.

"The interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate. This interim permitting approach is not intended to affect those storm water permits that already include appropriately derived numeric water quality-based effluent limitations. Since the interim permitting approach only addresses water quality-based effluent limitations, it also does not affect technology-based effluent limitations, such as those based on effluent limitations guidelines or developed using best professional judgment, that are incorporated into storm water permits.

"Each storm water permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations of subsequent permits. Such a monitoring program may include ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather necessary information.

"This interim permitting approach applies only to EPA; however, EPA also encourages authorized States and Tribes to adopt similar policies for storm water permits. This interim permitting approach provides time, where necessary, to more fully assess the range of issues and possible options for the control of storm water discharges for the protection of water quality. This interim permitting approach may be modified as a result of the ongoing Urban Wet Weather Flows Federal Advisory Committee policy dialogue on this subject."

One commenter challenged the Interim Permitting Policy on a procedural basis, arguing that it was published without opportunity for public notice and comment. In response, EPA notes that the Policy was included verbatim and made available for public comment in the proposal to today's final rule. Prior to that proposal, the Agency defended the application of the Policy on a case-by-case basis in individual permit proceedings. Moreover, the essential elements of the Policy—that narrative effluent limitations are the most appropriate form of effluent limitations for storm water dischargers from municipal sources—was inherent in § 122.34(a) of the proposed rule, and was the subject of extensive public comment. In any event, the Policy does not constitute a binding obligation. It is policy, not regulation.

Consistent with the recognition of data needs underlying the Policy, EPA will evaluate the small MS4 storm water regulations after the second round of permit issuance. Section 122.34(e)(2) of today's rule expressly provides that for the interim ten-year period, "EPA strongly recommends that until the evaluation of the storm water program in § 122.37, no additional requirements beyond the minimum control measures be imposed on regulated small MS4s without the agreement of the operator of the affected small MS4, except where an approved TMDL or equivalent analysis provides adequate information to develop more specific measures to protect water quality." This approach addresses the concern for protecting water resources from the threat posed by storm water discharges with the important qualification that there must be adequate information on the watershed or a specific site as a basis for requiring tailored storm water controls beyond the minimum control measures. As indicated, the Interim Permitting Policy has several important limitations—it does not apply to technology-based controls or to sources that already have numeric end of pipe effluent limitations. EPA encourages authorized States and Tribes to adopt policies similar to the Interim Permitting Policy when developing storm water discharge programs. For a discussion of appropriate monitoring activities, see Section H.3.d., Evaluation and Assessment.

Where a water quality analysis indicates there is a need and basis for deriving water quality-based effluent limits in NPDES permits for storm water discharges regulated under today's rule, EPA believes that most of these cases would be satisfied by narrative effluent

limitations that require the implementation of BMPs. NPDES permit limits will in most cases continue to be based on the specific approach outlined in today's rule for the implementation of BMPs as the most appropriate form of effluent limitation to satisfy technology and water quality-based requirements. See § 122.34(a). For storm water management plans with existing BMPs, this may require further tailoring of BMPs to address the pollutant(s) of concern, the nature of the discharge and the receiving water. If the permitting authority determines that, through implementation of appropriate BMPs required by the NPDES storm water permit, the discharge has the necessary controls to provide for attainment of water quality standards, additional controls are not needed in the permit. Conversely, if a discharger (MS4, industrial or construction) fails to adopt and implement adequate BMPs, the permittee and/or the permitting authority should consider a different mix of BMPs or more specific conditions to ensure water quality protection.

Some commenters observed that there was no evidence from the experience of storm water dischargers regulated under the existing NPDES storm water program, or from studies or reports that allegedly support EPA's position, that implementation of BMPs to satisfy the six minimum control measures would meet applicable water quality standards for a regulated small MS4. In response, EPA acknowledges that the six minimum measures are intended to implement the statutory requirement to control discharges to the maximum extent practicable, and they may not result in the attainment of water quality standards in all cases. The control measures do, however, focus on and address well-documented threats to water quality associated with storm water discharges. Based on the collective expertise of the FACA Subcommittee, EPA believes that implementation of the six minimum measures will, for most regulated small MS4s, be adequate to protect water quality, and for other regulated small MS4s will substantially reduce the adverse impacts of their discharges on water quality.

Some commenters asserted that analyses of existing water quality criteria suggest that numeric criteria for aquatic life may be overprotective if applied to storm water discharges. These comments maintained that an approach that prohibits exceedance of applicable water quality criteria is unworkable. Various commenters recommended wet weather specific

criteria, variances to the criteria during wet weather events, and seasonal designated uses. Other commenters noted that water quality-based effluent limits in NPDES permits have traditionally been developed based on dry weather flow conditions (e.g., assuming critical low-flow conditions in the receiving water to ensure protection of aquatic life and human health). Wet weather discharges, however, typically occur under high-flow conditions in the receiving water. Assumptions regarding mass balance equations and size of mixing zones may also not be pertinent during wet weather.

EPA acknowledges the need to devise a regulatory program that is both flexible enough to accommodate the episodic nature, variability and volume of wet weather discharges and prescriptive enough to ensure protection of the water resource. EPA believes that wet weather discharges can be adequately addressed in the existing regulations through refining designated uses and assigning criteria that are tailored to the level of water quality protection described by the refined designated use.

EPA believes that lack of precision in assigning designated uses and corresponding criteria by States and Tribes, in many cases may result in application of water quality criteria that may not appropriately match the intended condition of the water body. States and Tribes have frequently designated uses without regard to site-specific wet weather conditions. Because certain uses (swimming, for example) might not exist during high-intensity storm events or in the winter, States may factor such climatic conditions and seasonal uses into their use designations with appropriate analyses. This would acknowledge that a lower level of control, at lower compliance cost, would be appropriate to protect that use. Before modifying any designated use, however, States would need to evaluate the effect of less stringent water quality criteria on protecting other uses, including any threatened or endangered species, drinking water supplies and downstream uses. EPA will further evaluate these issues in the context of the Water Quality Standards Regulation, Advance Notice of Proposed Rule Making (ANPRM), 63 FR, 36742, July 7, 1998.

One of the major themes presented by EPA in the ANPRM is that refinement in use designations and tailoring of water quality criteria to match refined use designations is an important future direction of the water quality standards program. In assigning criteria to protect

general use classifications, a State or Tribe must ensure that the criteria are sufficiently protective to safeguard the full range of waters of the State, i.e., criteria would be based on the most sensitive use. This approach has been disputed, especially for aquatic life uses, where evidence suggests that the general use criteria will require controls more stringent than needed to protect the existing or potential aquatic life community for a specific water body. EPA recognizes that there is a growing need to more precisely tailor use descriptions and criteria to match site-specific conditions, ensuring that uses and criteria provide an appropriate level of protection, which, to the extent possible, are not overprotective. EPA is engaged in an ongoing evaluation of its regulations in this area through the ANPRM effort. At the same time, EPA continues to encourage States and Tribes to review the applicability of the designated uses and associated criteria using existing provisions in the water quality standards regulation.

2. Total Maximum Daily Loads and Analysis To Determine the Need for Water Quality-Based Limitations

The development and implementation of total maximum daily loads (TMDLs) provide a link between water quality standards and effluent limitations. CWA section 303(d) requires States to develop TMDLs to provide more stringent water quality-based controls when technology-based controls are inadequate to achieve applicable water quality standards. A TMDL is the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources, with consideration for natural background conditions. A TMDL quantifies the maximum allowable loading of a pollutant to a water body and allocates this maximum load to contributing point and nonpoint sources so that water quality criteria will not be exceeded and designated uses will be protected. A TMDL also includes a margin of safety to account for uncertainty about the relationship between pollutant loads and water quality.

Today's final rule refers to TMDLs in several provisions. For the purpose of today's rule, EPA relies on the component of the TMDL that evaluates existing conditions and allocates loads. For discharges to waters that are not impaired and for which a TMDL has not been developed, today's rule also refers to an "equivalent analysis." The discussion that follows uses the term "TMDL" for both.

Under revised § 122.26(a)(9)(i)(C), the permitting authority may designate

storm water discharges that require NPDES permits based on TMDLs that address the pollutants of concern. For storm water discharges associated with small construction activity, § 122.26(b)(15)(i)(B) provides a waiver provision where it may be determined that storm water controls are not needed based on TMDLs that address sediment and any other pollutants of concern. The NPDES permitting authority may waive requirements under the program for certain small MS4s within urbanized areas serving less than 1,000 persons provided that, if the small MS4 discharges any pollutant that has been identified as a cause of impairment of a water body into which it discharges, the discharge is in compliance with a wasteload allocation in a TMDL for the pollutant of concern. The permitting authority may also waive requirements for MS4s in urbanized areas serving between 1,000 and 10,000 persons, if the permitting authority determines that storm water controls are not needed, as provided in § 123.35(d)(2). See § 122.32(c).

Under CWA section 303(d), States identify which of their water bodies need TMDLs and rank them in order of priority. Generally, once a TMDL has been completed for one or more pollutants in a water body, a wasteload allocation for each point source discharging the pollutant(s) is implemented as an enforceable condition in the NPDES permit. Regulated small MS4s are essentially like other point source discharges for purposes of the TMDL process.

A TMDL and the resulting wasteload allocations for pollutant(s) of concern in a water body may not be available because the water body is not on the State's 303(d) list, the TMDL has not yet been completed, or the TMDL did not include specific pollutants of concern. In these cases, the permitting authority must determine whether point sources discharge pollutant(s) in amounts that cause, have the reasonable potential to cause, or contribute to excursions above State water quality standards, including narrative water quality criteria. This so-called "reasonable potential" analysis is intended to determine whether and for what pollutants water quality based effluent limits are required. The analysis is, in effect, a substitute for a similar determination that would be made as part of a TMDL, where necessary. When "reasonable potential" exists, regulations at § 122.44(d) require a water quality-based effluent limit for the pollutant(s) of concern in NPDES permits. The water quality-based effluent limits may be narrative requirements to implement BMPs or,

where necessary, may be numeric pollutant effluent limitations.

Commenters, generally from the regulated community, objected that, due to references to the need to develop a program "to protect water quality" and to additional NPDES permit requirements beyond the minimum control measures based on TMDLs or their equivalent, regulated small MS4s will be subject to uncertain permit limitations beyond the six minimum control measures. Commenters also asserted that through the imposition of a wasteload allocation under a TMDL in impaired water bodies, there is a likelihood that unattainable, yet enforceable narrative and numeric standards will be imposed on regulated small MS4s.

As is discussed in the preceding section, NPDES permits must include any more stringent limitations when necessary to meet water quality standards. However, even if a regulated small MS4 is subject to water quality based effluent limits, such limits may be in the form of narrative effluent limitations that require the implementation of BMPs. As discussed earlier, EPA has adopted the Interim Permitting Policy and incorporated it in the development of today's rule to recognize the appropriateness of BMP-based limits developed on a case-by-case basis.

EPA formed a Federal Advisory Committee to provide advice to EPA on identifying water quality-limited water bodies, establishing TMDLs for them as appropriate, and developing appropriate watershed protection programs for these impaired waters in accordance with CWA section 303(d). Operating under the auspices of the National Advisory Council for Environmental Policy and Technology (NACEPT), the committee produced its *Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program* (July 1998). EPA recently published a proposed rule to implement the Report's recommendations (64 FR 46012, August 23, 1999).

3. Anti-Backsliding

In general, the term "anti-backsliding" refers to statutory provisions at CWA sections 303(d)(4) and 402(o) and regulatory provisions at 40 CFR 122.44(l). These provisions prohibit the renewal, reissuance, or modification of an existing NPDES permit that contain effluent limits, permit terms, limitations and conditions, or standards that are less stringent than those established in the previous permit. There are also

exceptions to this prohibition known as "antibacksliding exceptions."

The issue of backsliding from prior permit limits, standards, or conditions is not expected to initially apply to most storm water dischargers designated under today's proposal because they generally have not been previously authorized by an NPDES permit. However, the backsliding prohibition would apply if a storm water discharge was previously covered under another NPDES permit. Also, the backsliding prohibition could apply when an NPDES storm water permit is reissued, renewed, or modified. In most cases, however, EPA does not believe that these provisions would restrict revisions to storm water NPDES permits.

One commenter questioned whether, if BMPs implemented by a regulated small MS4 operator fail to produce results in removal of pollutants and the permittee attempts to substitute a more effective BMP, the small MS4 operator could be accused of violating the anti-backsliding provisions and also be exposed to citizen lawsuits. In response, EPA notes that in such circumstances the MS4's permit has not changed and, therefore, the prohibition against backsliding is not applicable. Further, any change in the mix of BMPs that was intended to be more effective at controlling pollutants would not be considered backsliding, even if it did not include all of the previously implemented BMPs.

4. Water Quality-Based Waivers and Designations

Several sections of today's final rule refer to water quality standards in identifying those storm water discharges that are and are not required to be permitted under today's rule. As noted in § 122.30 of today's rule, CWA section 402(p)(6) requires the designation of municipal storm water sources that need to be regulated to protect water quality and the establishment of a comprehensive storm water program to regulate these sources. Requirements applicable to certain municipal sources may be waived based on the absence of demonstrable water quality impacts. Section 122.32(c). The section 402(p)(6) mandate to protect water quality also provides the basis for regulating discharges associated with small construction. See also § 122.26(b)(15)(i). Further, today's rule carries forward the existing authority for the permitting authority to designate sources of storm water discharges based upon water quality considerations. Section 122.26(a)(9)(i)(C) and (D).

As is discussed above in sections II.H.2.e (for small MS4s) and II.I.1.b.ii

(for small construction), the requirements of today's rule may be waived based on wasteload allocations that are part of "total maximum daily loads" (TMDLs) that address the pollutants of concern or, in the case of small construction and municipalities serving between 1,000 and 10,000 persons, the equivalents of TMDLs. One commenter stated that waivers would allow exemptions to the technology based requirements and would thus be inconsistent with the two-fold approach of the CWA (a technology based minimum and a water quality based overlay). EPA acknowledges that waivers are not allowed for other technology-based requirements under the CWA. A more flexible approach is allowed, however, for sources designated for regulation under 402(p)(6) to protect water quality. For such sources EPA may allow a waiver where it is demonstrated that an individual source does not present the

threat to water quality that was the basis for EPA's designation.

III. Cost-Benefit Analysis

EPA has determined that the range of the rule's benefits exceeds the range of regulatory costs. The estimated rule costs range from \$847.6 million to \$981.3 million annually with corresponding estimated monetized annual benefits which range from \$671.5 million to \$1.628 billion, expected to exceed costs.

The rule's cost and benefit estimates are based on an annual comparison of costs and benefits for a representative year (1998) in which the rule is implemented. This differs from the approach used for the proposed rule which projected cost and benefits over three permit terms. EPA has chosen to use the current approach because it determined that the ratio of annual benefits and costs would not change significantly over time. Moreover,

because there is not an initial outlay of capital costs with benefits accruing in the future (i.e., benefits and costs are almost immediately at a steady state), it is not necessary to discount costs in order to account for a time differential.

EPA developed detailed estimates of the costs and benefits of complying with each of the incremental requirements imposed by the rule. The Agency used two approaches, a national water quality model and national water quality assessment, to estimate the potential benefits of the rule. Both approaches show that the benefits are likely to exceed costs.

These estimates, including descriptions of the methodology and assumptions used, are described in detail in the *Economic Analysis of the Final Phase II Rule*, which is included in the record of this rule making. Exhibit 3 summarizes costs and benefits associated with the basic elements of today's rule.

EXHIBIT 3.—COMPARISON OF ANNUAL COMPLIANCE COST AND BENEFIT ESTIMATES ¹

Monetized benefits	National water quality model (millions of 1998 dollars)	National water quality assessment (millions of 1998 dollars)
Municipal Minimum Measures .....	.....	\$131.0–\$410.2
Controls for Construction Sites .....	.....	\$540.5–\$686.0
Total Annual Benefits	\$1,628.5	\$671.5–\$1,096.2
Costs	Millions of 1998 dollars ²	
Municipal Minimum Measures	\$297.3	
Controls/Waivers for Construction Sites	\$545.0–\$678.7	
Federal/State Administrative Costs	\$5.3	
Total Annual Costs	\$847.6–\$981.31	

¹ National level benefits are not inclusive of all categories of benefits that can be expected to result from the regulation.

² Total may not add due to rounding.

A. Costs

1. Municipal Costs

Initially, to determine municipal costs for the proposed rule, EPA used anticipated expenditure data included in permit applications from a sample of 21 Phase I MS4s. Certain commenters criticized the Agency for using anticipated expenditures because they could be significantly different from the actual expenditures. These commenters suggested that the Agency use the actual cost incurred by the Phase I MS4s. Other comments stated that because the Phase I MS4s, in general, are large municipalities, they may not be representative of the Phase II MS4s for estimating regulatory costs. Finally, one commenter noted that the sample of 21 municipalities used to project cost was relatively small.

To address the concerns of the commenters, EPA utilized a National Association of Flood and Stormwater Management Agencies (NAFSMA) survey of the Phase II community to obtain incremental cost estimates for Phase II municipalities. Using the list of potential Phase II designees published in the **Federal Register** (63 FR 1616), NAFSMA contacted more than 1,600 jurisdictions. The goal of the survey was to solicit information from those communities about the proposed Phase II NPDES storm water program. Several of the survey questions corresponded directly to the minimum measures required by the Phase II rule. One hundred twenty-one surveys were returned to NAFSMA and were used to develop municipal costs.

Using the NAFSMA information, EPA estimated average annual per household

program costs for automatically designated municipalities. EPA also estimated an average annual per household administrative cost for municipalities to address application, record keeping, and reporting requirements of the Rule. The total average per household cost of the rule is expected to \$9.16 per household.

To determine potential national level costs for municipalities, EPA multiplied the number of households (32.5 million) by the per household cost (\$9.16). EPA estimates the annual cost of the Phase II municipal program at \$298 million.

As an alternative method, and point of comparison, to the NAFSMA-based approach, EPA reviewed actual expenditures reported from 35 Phase I MS4s. The Agency targeted these 35 Phase I MS4s because they had participated in the NPDES program for

nearly one permit term, were smaller in size and had detailed data reflecting their actual program implementation costs. Of the 35 MS4s, appropriate cost data was only available for 26 of those MS4s. EPA analyzed the expenditure data and identified the relevant expenditures, excluding costs presented in the annual reports unrelated to the requirements of the Rule. The cost range and annual per household program costs of \$9.08 are similar to those found using the NAFSMA survey data.

2. Construction Costs

In order to estimate the rule's construction-related cost on a national level (the soil and erosion controls (SEC) requirements of the rule and the potential impacts of the post-construction municipal measure on construction), EPA estimated a per site cost for sites of one, three, and five acres and multiplied these costs by the total number of estimated Phase II construction starts across these size categories.

To estimate the percentage of starts subject to the soil and erosion control requirements between 1 and 5 acres, with respect to each category of building permits (residential, commercial, *etc.*), EPA initially used data from Prince George's County (PGC), Maryland, and applied these percentages to national totals. In the proposal, EPA recognized that the PGC data may not be representative of the entire country and requested data that could be used to develop better estimates of the number of construction sites between 1 and 5 acres. EPA did not receive any substantiated national data from commenters.

In view of the unavailability of national data from commenters, EPA made extensive efforts to collect construction site data around the country. The Agency contacted more than 75 municipalities. EPA determined that 14 of the contacted municipalities had useable construction site data. Using data from these 14 municipalities, EPA developed an estimate of the percentage of construction starts on one to five acres. EPA then multiplied this percentage by the number of building permits issued nationwide to determine the total number of construction starts occurring on one to five acres. Finally, to isolate the number of construction starts incrementally regulated by Phase II, EPA subtracted the number of activities regulated under equivalent programs (*e.g.*, areas covered by the Coastal Zone Act Reauthorization Amendments of 1990, and areas covered by equivalent State level soil and erosion control requirements).

Ultimately, EPA estimated that 110,223 construction starts would be incrementally covered by the rule annually.

EPA then used standard cost estimates from *Building Construction Cost Data* and *Site Work Landscape Cost Data* (R.S. Means, 1997a and 1997b) to estimate construction BMP costs for 27 model sites in a variety of typical site conditions across the United States. The model sites included three different site sizes (one, three and five acres), three slope variations (3%, 7%, and 12%), and three soil erosivity conditions (low, medium, and high). EPA chose BMP combinations appropriate to the model site conditions. Based on the assumption that any combination of site factors is equally likely to occur in a given site, EPA developed average cost of sediment and erosion control for all model sites. EPA estimated that, on average, BMPs for a 1 acre site will cost \$1,206, for a 3 acre site \$4,598 and for a 5 acre site \$8,709.

EPA then estimated administrative costs per construction site for the following elements required under the rule: Submittal of a notice of intent for permit coverage; notification to municipalities; development of a storm water pollution prevention plan; record retention; and submittal of a notice of termination. EPA estimated the average total administrative cost per site to be \$937.

EPA also considered the cost implications of NPDES permit authorities waiving the applicability of requirements to storm water discharges from small construction sites based on two different criteria involving water quality impact and low rainfall. EPA received comments stating that a waiver would require a significant investment in training or acquisition of a consultant. Based on comments received, EPA eliminated one of the waiver conditions involving low soil loss threshold because it necessitated use of the Revised Universal Soil Loss Equation which could require extensive technical expertise.

Based on the opinions of construction industry experts, EPA estimates that 15 percent of the construction sites that would otherwise be covered by today's rule will be eligible to receive waivers. Therefore, the Agency has excluded 15 percent of the construction sites when deriving costs of sediment and erosion control. The average cost for sites to qualify for the waiver is expected to be \$34 per site. The construction cost analysis for the proposed rule did not include any costs for the preparation and submission of waiver applications

because EPA believed those costs would be negligible. However, in response to public comments, EPA has estimated these potential costs.

EPA has also estimated the potential costs for construction site operators to implement the post-construction minimum measure. These are costs that may be incurred by construction site operators if the MS4 chooses to meet the post-construction minimum measure by requiring on-site structural, site-by-site control of post-construction runoff. Municipalities may select from an array of structural and non-structural options in implementing this measure, so the potential costs to construction operators is uncertain. Nonetheless, EPA developed average annual BMP costs for sites of one, three, five and seven acres. EPA's analysis accounted for varying levels of imperviousness that characterize residential, commercial, and institutional land uses. Nationwide, these costs are expected to range from \$44 million to \$178 million annually.

Finally, to establish national incremental annual costs for Phase II construction starts, EPA multiplied the total costs of compliance for the chosen site size categories by the total number of Phase II construction starts and added post-construction costs. EPA estimates the annual compliance cost to range from \$545 million to \$678.7 million.

B. Quantitative Benefits

In the Economic Analysis for the proposed rule, a "top-down" approach was used to estimate economic benefits. Under this approach, the combined economic benefits for wet weather programs were estimated first, and then were divided among various water programs on the basis of expert opinion. As a result, the benefits estimates for an individual program were rather uncertain. Moreover, this approach was inconsistent with the approach used to estimate the cost of the proposed storm water rule, which was developed using municipal-based and cost-based data to develop "bottom-up" costs. Therefore, EPA decided to use a "bottom-up" approach for estimating benefits of the Phase II rule. To adequately reflect the quantifiable benefits of the rule, EPA used two different methods: (1) National Water Quality Model and (2) National Water Quality Assessment.

To monetize benefits in both approaches, the Agency applied Carson and Mitchell's (1993) estimates of household willingness-to-pay (WTP) for water quality improvement to estimates of waters impaired by storm water discharges. Carson and Mitchell's 1993 study reports the results of their 1983 national survey of WTP for incremental

improvements in fresh water quality. Carson and Mitchell estimate the WTP for three minimum levels of fresh water quality: boatable, fishable, and sizable. EPA adjusted the WTP amounts to account for inflation, growth in real per capita income, and increased attitudes towards pollution control. The adjusted WTP amounts for improvements in fresh water quality are \$210 for boatable, \$158 for fishable, and \$177 for sizable. A brief summary of the national water quality model and national water quality assessment approaches follow.

1. National Water Quality Model

One approach EPA used to estimate the benefits of the Phase II municipal and construction site controls was the National Water Pollution Control Assessment Model (NWPCAM). NWPCAM estimates benefits of the storm water program at the national level, including the impact on small streams. This model estimates water quality and the resultant use support for the 632,000 miles of rivers and streams in the USEPA Reach File Version 1 (RF1), which covers the continental

United States. The model analyzes water quality changes by stream reach. The parameters modeled in the NWPCAM are biological oxygen demand (BOD), total suspended solids (TSS), dissolved oxygen (DO), and fecal coliforms (FC).

The model projects changes in water quality due to the Phase II municipal and construction site controls. To calculate the economic benefits of change in water quality, the number of households in the proximity of the stream reach are determined, by overlaying the model results on the 1990 Census of Populated Places and Minor Civil Divisions, and updating the population to 1998. Economic benefits are calculated using the Carson and Mitchell WTP values. The benefits are separately estimated for local and non-local waters on the basis of WTP values and proximity to water quality changes.

The value of the change in use support for local waters is greater than the value of the non-local waters because of the opportunity to use local waters by the local population. This model assumes that if improvement

occurs in waters that are not close to population centers the economic value is lower. Therefore, benefits are estimated for local and non-local waters separately. This assumption is based on Carson and Mitchell's survey which asked respondents to apportion each of their stated WTP values between achieving the water quality goals in their own State and achieving those goals in the nation as a whole. On average, respondents allocated 67% of their values to achieving in-State water quality goals and the remainder to the nation as a whole. Carson and Mitchell argue that for valuing local water quality changes 67% is a reasonable upper bound for the local multiplier and 33% for the non-local water quality changes. For the purposes of this analysis, the locality is defined as urban sites and associated populations linked into the NWPCAM framework. Using this methodology, the total monetized benefits of Phase II control of urban and construction site runoff is estimated to be \$1.628 billion per year. The local and non-local benefits due to Phase II controls are presented in Exhibit 4.

EXHIBIT 4.—LOCAL AND NON-LOCAL BENEFITS ESTIMATES DUE TO PHASE II CONTROLS NATIONAL WATER QUALITY MODEL ESTIMATE

Use support	Local benefits (\$million/yr)	Non-local benefits ¹ (\$million/yr)	Total benefits (\$million/yr)
Swimming, Fishing, and Boating	306.20	60.60	366.80
Fishing and Boating	395.10	51.90	447.00
Boating	700.10	114.60	814.70
Total	1401.40	227.10	1628.50

¹ To estimate non-local willingness to pay per household, the 33% of willingness is multiplied by the fraction of previously impaired national waters (in each use category) that attain the beneficial use as a result of the Phase II rule. To estimate the aggregate non-local benefits, non-local willingness to pay is multiplied with the total number of households in the US.

While the numbers of miles that are estimated to change their use support are small, the benefits estimates are quite significant. This is because urban runoff and, to a large extent, construction activity occurs where the people actually reside and the water quality changes mostly occur close to these population centers. NWPCAM indicates that changes in pollution loads have the most effect immediately downstream of pollution changes. As a result, the aggregate WTP is large because large numbers of households in these population centers are associated with the local waters that reflect improvement in designated use support.

2. National Water Quality Assessment

EPA also estimated benefits of the Phase II Storm Water program using the 1998 National Water Quality Inventory (305(b)) Report to Congress, rather than

the NWPCAM as a basis for estimating impairment addressed by the rule. The Water Quality Assessment method separately estimates benefits associated with improvements to fresh water, marine water and construction site controls, and then aggregates these separate categories into an estimate of total annual benefits.

a. Municipal Measures

i. Fresh Waters Benefits

In order to develop estimates for the potential value of the municipal measures (except storm water runoff controls for construction sites), EPA applied Carson & Mitchell WTP values to estimated existing and projected future fresh water impairment. Carson & Mitchell did not evaluate marine waters, so only fresh water values were available from their research. Even

though the Carson and Mitchell estimates apply to all fresh water, it is not clear how these values would be apportioned among rivers, lakes, and the Great Lakes. The 305(b) data indicate that lakes are the most impaired by urban runoff/storm sewers, followed closely by the Great Lakes, and then rivers. Therefore, EPA applied the WTP values to the categories separately and assumed that the higher resulting value for lakes represents the high end of the range (i.e., assuming that lake impairment is more indicative of national fresh water impairment) and that the lower resulting value for impaired rivers represents the low end of a value range for all fresh waters (i.e., assuming that river impairment is more indicative of national fresh water impairment). In addition, EPA estimated that the post-construction runoff

requirements of the municipal program might result in benefits of at least \$16.8 million annually from avoided future runoff. The post-construction estimate significantly underestimates potential program benefits because it does not account for avoided hydrologic changes and resulting water quality impairment associated with increases in imperviousness from development and redevelopment. Summing the benefits across the water quality use support levels yields an estimate of benefits ranging from approximately \$121.9 million to \$378.2 million per year.

ii. Marine Waters Benefits

In addition to the fresh water benefits captured by the Carson and Mitchell study, EPA anticipates benefits as a result of improvements to marine waters. Sufficient methods have not been developed to quantify national-level benefits for commercial or recreational fishing. EPA used beach closure data and visitation estimates from its Beach Watch Program to estimate potential reductions in marine swimming visits due to storm water runoff contamination events in 1997. The estimated 86,100 trips that did not occur because of beach closures in coastal Phase II communities is a lower bound because it represents only those beaches that report both closures and visitation data. EPA estimates potential swimming benefits from the rule to be at least \$2.1 million annually.

EPA developed an analysis of potential benefits associated with avoided health impacts from exposure to contaminants in storm sewer effluent. Based on a study of incremental illnesses found among people who swam within one yard of storm drains in Santa Monica Bay, EPA estimated a range of incremental illnesses (Haile *et al.*, 1996). Depending on assumptions made about number of exposures to contaminants and contaminant concentrations, benefits ranged from \$7.0 million to \$29.9 million annually.

b. Construction Benefits

The major pollutant resulting from construction activities is sediment. However, in addition to sediment, construction activities also yield pollutants such as pesticides, petroleum products, and solvents. Because circumstances will vary considerably from site to site, data is not available with which to develop estimates of benefits for each site and aggregate to obtain a national-level estimate.

In the proposed rule, EPA estimated the combined benefits of all wet weather programs, and then used expert opinions to allocate them to different individual programs. To eliminate the possible overlap between the benefits of the soil and erosion control requirements, municipal measures, and other wet weather storm water programs, EPA chose to use an approach in today's final rule that directly

estimates the benefits of soil and erosion requirements.

A survey of North Carolina residents (Paterson *et al.*, 1993) indicated that households are willing to pay for erosion and sediment controls similar to those in today's rule. Based on income and other indicators, the values derived from the study are expected to be similar to values held in the rest of the country. Using the mean value of the willingness to pay of \$25 per household, EPA projects annual benefits of the soil and erosion requirements to range from \$540.5-\$686 million.

c. Summary of Benefits From the National Water Quality Assessment

Total benefits from municipal measures and construction site controls are expected to range from \$671.5 million to \$1.1 billion per year, including benefits of approximately \$13.7 million per year associated with small stream improvements. A summary of the potential benefits is presented in Exhibit 5.

As shown in Exhibit 5, it was not possible to monetize all categories of benefits using the WTP estimates. In particular, benefits for improving marine water quality such as fishing and passive use benefits are not included in the values used to estimate the potential benefits of the municipal minimum measures (excluding construction sites controls), and they are not estimated separately, because information is not currently available.

EXHIBIT 5.—POTENTIAL ANNUAL BENEFITS OF THE PHASE II STORM WATER RULE NATIONAL WATER QUALITY ASSESSMENT ESTIMATE

Benefit category	Annual WTP
Municipal Minimum Measures ¹	
Fresh Water Use and Passive Use ²	\$121.9-\$378.2
Marine Recreational Swimming	\$2.1
Human Health (Marine Waters)	\$7.0-\$29.9
Other Marine Use and Passive Use	(+)
Erosion and Sediment Controls for Construction Sites	
Fresh Water and Marine Use and Passive Use ³	\$540.5-\$686
Total Phase II Program	
Total Use & Passive Use (Fresh Water and Marine)	>\$671.5->\$1,096.2

+ = positive benefits expected but not monetized.

¹ Includes water quality benefit of municipal programs, based on 80% effectiveness of municipal programs.

² Based on research by Carson and Mitchell (1993). Fresh water value only. Does not include commercial fishery, navigation, or diversionary (e.g. municipal drinking water cost savings or risk reductions) benefits. May not fully capture human health risk reduction or ecological values.

³ Based on research by Paterson *et al.* (1993). Although the survey's description of the benefits of reducing soil erosion from construction sites included reduced dredging, avoided flooding, and water storage capacity benefits, these benefit categories may not be fully incorporated in the WTP values. Small streams may account for over 2% of total benefits.

C. Qualitative Benefits

There are additional benefits to storm water control that cannot be quantified

or monetized. Thus, the current estimate of monetized benefits may understate the true value of storm water controls

because it omits many ways in which society is likely to benefit from reduced storm water pollution, such as improved

aesthetic quality of waters, benefits to wildlife and to threatened and endangered species, cultural values, and biodiversity benefits.

A benefit that EPA did not monetize completely is the flood control benefits attributable to municipal storm water controls reducing downstream flooding, although flood control benefits associated with sediment and erosion control are already reflected to some extent in the construction benefits. Similarly, the Agency could not value the benefits from increased property value due to storm water controls reflected in the rule, even though a commenter suggested inclusion of these benefits in the estimates.

Moreover, while a number of commenters requested that EPA include ecological benefits, the Agency was not able to fully monetize these benefits. Urbanization usually increases the amount of sediment, nutrients, metals and other pollutants associated with land disturbance and development. Development usually not only results in a dramatic increase in the volume of water runoff, but also in a substantial decrease in that water's quality due to stream scour, runoff and dispersion of toxic pollutants, and oversiltation. These kinds of secondary benefits could not be fully reflected in the monetized benefits. EPA was able to only monetize the aquatic life support benefits for waters assumed to be impaired. Thus, only the aquatic life support benefits attributable to municipal controls, reflected through human satisfaction, are taken into account.

Reduced nutrient level is another benefit of the storm water control which is not fully captured by the economic analysis. High nutrient levels often lead to eutrophication of the aquatic system. The quality change in ecological sources as the result of storm water controls to reduce pollutants is not fully reflected in the present benefits.

D. National Economic Impact

Finally, the Agency determined that the rule will have minimal impacts on

the economy or employment. This is because the final rule regulates small MS4s and construction sites under 5 acres, not the typical industrial plants or other non-construction activities that could directly impact production and thus those sectors of the economy.

Discussions with representatives within the construction industry indicate that construction costs will likely be passed on to buyers, thus not seriously affecting the housing industry directly. One commenter argued that the rule will have a negative employment effect because the builders will build fewer homes requiring less building materials as a result of the declining demand induced by the cost of the soil and erosion controls. EPA disagrees with this argument because the cost of the controls, as the percentage of the price of a median home, is negligible and will be passed on to final buyers.

Flexibility within the rule allows MS4s to tailor the storm water program requirements to their needs and financial position, minimizing impacts. For sedimentation and erosion controls on construction sites, the rule contemplates application of commonly used BMPs to reduce costs for the construction industry. Thus, the rule attempts to use existing practices to prevent pollution, which should minimize impacts on States, Tribes, municipalities and the construction industry.

Thus, EPA concludes that the effect of the rule, if any, on the national economy will be minimal. The benefits of today's rule more than offset any cost impacts on the national economy.

IV. Regulatory Requirements

A. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved some of the information collection requirements contained in this final rule (*i.e.* those found in 40 CFR 122.26(g) and 123.35(b)) under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2040-0211.

The burden and costs described below are for the information collection, reporting, and record keeping requirements for the three year period beginning with the effective date of today's rule. Additional information collection requirements for regulated small MS4s and small construction sites will occur after this initial three year period and will be counted in a subsequent information collection requirement. The total burden of the information collection requirements for the first three years of this rule is estimated at 56,369 hours with a corresponding cost of \$2,151,305 million annually. This burden and cost is for industrial facilities to complete and submit the no exposure certification, for NPDES-authorized States to process and review the no exposure certification, and for the NPDES-authorized States to develop designation criteria and assess additional MS4s outside of urbanized areas. Compliance with the applicable information collection requirements imposed under this rule are mandatory, pursuant to CWA section 402.

Exhibit 6 presents average annual burden and cost estimates for Phase II respondents for the first three years. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust existing ways for complying with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

EXHIBIT 6.—AVERAGE ANNUAL BURDEN AND COST ESTIMATES FOR PHASE II RESPONDENTS

Information collection activity	A Respondents per year (projected) ¹	B Burden hours per respondent per year (predicted)	(A)×(B)=C Annual re- spondent bur- den hours (projected)	D Respondent labor cost (\$/ hr) (1998 \$)	(C)×(D)=E Annual Cost (\$ (projected)
Ind. No Expos. Facilities: ² No Expos. Certification	36,377	1.0	36,377	44.35	1,613,320
Annual Subtotal			36,377		1,613,320
NPDES-Authorized States: ³ Designation of Addit. MS4s ⁴	15	332.8	4,892	26.91	131,644

EXHIBIT 6.—AVERAGE ANNUAL BURDEN AND COST ESTIMATES FOR PHASE II RESPONDENTS—Continued

Information collection activity	A Respondents per year (projected) ¹	B Burden hours per respond- ent per year (predicted)	(A)×(B)=C Annual re- spondent bur- den hours (projected)	D Respondent labor cost (\$/ hr) (1998 \$)	(C)×(D)=E Annual Cost (\$) (projected)
No Exp. Cert. Proc. & Rev	30,200	0.5	15,100	26.91	406,341
Annual Subtotal			19,992		537,985
Annual Totals			56,369		2,151,305

Notes:

¹Source: U.S. EPA, Office of Wastewater Management. Economic Analysis for the Storm Water Phase II Rule.

²The total number of potential no exposure respondents was divided by 5 to estimate an annual total. It was assumed that the annual number of respondents for the no exposure certification would be spread over the five year period the exclusion applies.

³The number of respondents in each category represents only those respondents located within the 44 NPDES-authorized States and Territories. The burden and cost estimates provided in this section are for the NPDES-authorized States in their role as the permitting authority for municipal designations and industrial no exposure.

⁴The number of respondents for this activity, 15, represents the number of NPDES-authorized States and Territories that must develop designation criteria and assess small MS4s located outside of an urbanized area for possible Phase II coverage divided by the three year ICR period.

Given the requirements of today's regulation, EPA believes there will be no capital startup and no operation and maintenance costs associated with information collection requirements of the rule.

The government burden associated with today's rule will impact State, Tribal, and Territorial governments (NPDES-authorized governmental entities) that have storm water program authority, as well as the federal government (*i.e.*, EPA), where it is the NPDES permitting authority. As of March 1999, 43 States and the Virgin Islands had NPDES authority.

The annual burden imposed upon authorized governmental entities (delegated States and the Virgin Islands) and the federal government for the next three years is estimated to be 19,992 hours (\$537,985) and 4,087 hours (\$115,948) respectively, for a total of 24,079 hours (\$653,933). This estimate is based on the average time that governments will expend to carry out the following activities: designate additional MS4s (332.8 hours) and process and review "no exposure" certificates from industrial dischargers (0.5 hour).

Under the existing rule, storm water discharges from light industrial activities identified under § 122.26(b)(14)(xi) were exempted from the permit application requirements if they were not exposed to storm water. Today's rule expands the applicability of the "no exposure" exclusion to include all industrial activity regulated under § 122.26(b)(14) (except category (x), construction). The "no exposure" provision is applied through the use of a written certification process, thus representing a slight reporting burden increase for "light" industries with "no exposure".

In addition to the information collection, reporting, and record keeping burden for the next three years, today's rule contains information collection requirements that will not begin until three years or more from the effective date of today's rule. These information collection requirements were not included in the information collection request approved by OMB. EPA will submit these burden estimates for OMB approval when it submits ICR 2040-0211 to OMB for renewal in three years. The rule burdens for regulated small MS4s and small construction sites that will be included in the ICR renewal fall into three areas: application for an NPDES permit or submittal of waiver information, record keeping of storm water management activities, and submittal of reports to the permitting authority. There will also be an additional burden for the permitting authority to review this information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15. EPA is amending the table in 40 CFR Part 9 of currently approved ICR control numbers issued by OMB for various regulations to list the first three years of information requirements contained in this final rule.

B. Executive Order 12866

Under Executive Order 12866, [58 FR 51,735 (October 4, 1993)] the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant

regulatory action" as one that is likely to result in a rule that may:

(1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a "significant regulatory action". As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

C. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any one year. Before promulgating an EPA rule for which a

written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted.

EPA has determined that today's rule contains a Federal mandate that may result in expenditures of \$100 million or more in any one year for both State, local, and tribal governments, in the aggregate, and the private sector. Accordingly, EPA has prepared under section 202 of the UMRA a written statement which is summarized below.

1. Summary of UMRA Section 202 Written Statement

EPA promulgates today's storm water regulation pursuant to the specific mandate of Clean Water Act section 402(p)(6), as well as sections 301, 308, 402, and 501. (33 U.S.C. sections 1342(p)(6), 1311, 1318, 1342, 1361.) Section 402(p)(6) of the CWA requires that EPA designate sources to be regulated to protect water quality and establish a comprehensive program to regulate those sources.

In the *Economic Analysis of the Final Phase II Rule* (EA), EPA describes the qualitative and monetized benefits associated with today's rule and then compares the monetized benefits with the estimated costs for the rule. EPA developed detailed estimates of the costs and benefits of complying with each of the incremental requirements imposed by the rule. These estimates, including descriptions of the methodology and assumptions used, are described in detail in the EA. The Agency used two approaches, a national water quality model and national water quality assessment, to estimate the potential benefits of the rule. Both approaches show that the benefits are likely to exceed costs. Exhibit 3 in section III of this preamble summarizes the costs and benefits associated with the basic elements of today's rule.

There are additional benefits to storm water control that cannot be quantified or monetized. Thus, the current estimate of monetized benefits may understate the true value of storm water controls because it omits many ways by which society is likely to benefit from reduced storm water pollution, such as improved

aesthetic quality of waters, benefits to wildlife and to threatened and endangered species, cultural values, and biodiversity benefits.

Several commenters asserted that today's rule is an unfunded mandate and that, without funding, the monitoring of the already existing pollution control programs would suffer. In section II.D.3 of the preamble, EPA lists some of the programs that EPA anticipates may provide funds to help develop and, in limited circumstances, implement storm water management programs.

In the EA, EPA reviewed the expected effect of today's rule on the national economy. The Agency determined that the rule will have minimal impacts on the economy or employment. This is because the final rule regulates small MS4s and construction sites under 5 acres, not the typical industrial plants or other non-construction activities that could directly impact production and thus those sectors of the economy.

Discussions with representatives within the construction industry indicate that construction costs will likely be passed on to buyers, thus not seriously affecting the housing industry directly. Flexibility within the rule allows MS4s to tailor the storm water program requirements to their needs and financial position, minimizing impacts. For sedimentation and erosion controls on construction sites, the rule contemplates application of commonly used BMPs to reduce costs for the construction industry. Thus, the rule attempts to use existing practices to prevent pollution, which should minimize impacts on States, Tribes, municipalities and the construction industry.

Thus, EPA concludes that the effect of the rule, if any, on the national economy would be minimal. The benefits of today's rule more than offset any cost impacts on the national economy.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA and Executive Order 12875, "Enhancing the Intergovernmental Partnership," EPA consulted with the governmental entities affected by this rule.

First, EPA provided States, Tribal and local governments with the opportunity to comment on draft alternative approaches for the proposed rule through publishing a notice requesting information and public comment in the **Federal Register** on September 9, 1992 (57 FR 41344). This notice presented a full range of regulatory alternatives. At that time, EPA received more than 130 comments, including approximately 43 percent from municipalities and 24

percent from State or Federal agencies. These comments were the genesis of many of the provisions in the today's rule, including reliance on the NPDES program framework (including general permits), providing State and local governments flexibility in selecting additional sources requiring regulation, and focusing on high priority polluters. These comments helped to focus on pollution prevention, watershed-based concerns and BMPs. They also led to certain exemptions for facilities that do not pollute national waters.

In early 1993, EPA, in conjunction with the Rensselaerville Institute, held public and expert meetings to assist in developing and analyzing options for identifying unregulated storm water sources and possible controls. These meetings provided participants an additional opportunity to provide input into the CWA section 402(p)(6) program development process. The final rule addresses several of the key concerns identified in these groups, including provisions that provide flexibility to the States to select sources to be controlled and types of permits to be issued, and flexibility to MS4s in selecting BMPs.

EPA also conducted outreach with representatives of small entities, including small government representatives, in conjunction with the convening of a Small Business Advocacy Review Panel under SBREFA which is discussed in section IV.E. of the preamble.

In addition, EPA established the Urban Wet Weather Flows Advisory Committee under the Federal Advisory Committee Act (FACA). The Urban Wet Weather Flows Advisory Committee, in turn established the Storm Water Phase II Subcommittee. Consistent with FACA, the membership of the Committee and the Storm Water Phase II Subcommittee was balanced among EPA's various outside stakeholder interests, including representatives from State governments, municipal governments (both elected officials and appointed officials) and Tribal governments, as well as industrial and commercial sectors, agriculture, environmental and public interest groups.

In general, municipal and Tribal government representatives supported the NPDES approach in today's rule for the following reasons: It will be uniformly applied on a nationwide basis; it provides flexibility to allow incorporation of State and local programs; it resolves the problem of donut holes that cause water quality impacts in urbanized areas; and it allows co-permitting of small regulated

MS4s with those regulated under the existing storm water program.

In contrast, State representatives sought alternative approaches for State implementation of the storm water program for Phase II sources. State representatives asserted that a non-NPDES alternative approach best facilitated watershed management and avoided duplication and overlapping regulations. These representatives pointed out that there are a variety of State programs—not based on the CWA—implementing effective storm water controls, and that EPA should provide incentives for their implementation and improvement in performance. EPA continues to believe that an NPDES approach is the best approach in order to adequately protect water quality. However, EPA has worked with States on an alternative approach that provides flexibility within the NPDES framework. The final rule allows States with a watershed permitting approach to phase in permit coverage for MS4s in jurisdictions with a population less than 10,000 and provides two waivers from coverage for small MS4s. This issue is discussed in section II.C of the preamble, Program Framework: NPDES Approach.

Some municipal governments objected that the rule's minimum measures for small MS4s violate the Tenth Amendment insofar as they require the operators of MS4s to regulate third parties according to the "minimum measures" for municipal storm water management programs. EPA disagrees that today's rule is inconsistent with Tenth Amendment principles. Permits issued under today's rule will not compel political subdivisions of States to regulate in their sovereign capacities, but rather to effectively control discharges out of their storm sewer systems in their owner/operator capacities. For MS4s that do not accept this "default" minimum measures-based approach (to control discharges out of the storm sewer system by exercising local powers to control discharges into the storm sewer system), today's rule allows for alternative permits through individual permit applications. EPA made revisions to the rule to allow regulated small MS4s to opt out of the minimum measures approach and instead apply for an individual permit. This issue is discussed in section II.H.3.c.iii of the preamble, Alternative Permit Option/Tenth Amendment.

2. Selection of the Least Costly, Most Cost-Effective or Least Burdensome Alternative That Achieves the Objectives of the Statute

Today's rule evolved over time and incorporated aspects of alternatives that responded to concerns presented by the various stakeholders. A primary characteristic of today's rule is the flexibility it offers both the permitting authority and the regulated sources (small MS4s and small construction sites), by the use of general permits, implementation of BMPs suited to specific locations, and allowing MS4s to develop their own program goals.

In the administrative record supporting the proposed rule, EPA estimated ranges of costs associated with six different options, including a no action option, the proposed option, and four other options that considered various combinations of the following: Covering all the unregulated construction sites below 5 acres, all small MS4s, certain industrial and commercial activities, and all point sources. EPA developed detailed cost estimates for the incremental requirements imposed under the final regulation, and for each of the alternatives, and applied these estimates to the remaining unregulated point sources of storm water. The Agency compared the estimated annual range of costs imposed under today's rule and other major options considered. The range of values for each option included the costs for compliance, including paperwork requirements for the operators of small construction sites, industrial facilities, and MS4s and administrative costs for State and Federal NPDES permitting authorities.

Today's rule reflects the least costly option that achieves the objectives of the statute, thus meeting the requirements of section 205. EPA did not consider "no regulation" to be an "option" because it would not achieve the objectives of CWA section 402(p)(6). A portion of currently unregulated point sources of storm water need to reduce pollutants to protect water quality.

Today's rule is estimated to range in cost from \$847.6 million to \$981.3 million annually, although the cost estimate for the proposed rule was reported as a range of \$138 to \$869 million annually. That range reflected a unit cost range for the municipal minimum measures and a cost range per construction site for soil erosion control. EPA has since revised its cost analysis to allow it to report the current estimate, which is toward the high end of the original cost range. The four other regulatory options considered at

proposal involved higher regulatory costs and, therefore, were not selected. These four options and their estimated costs are as follows:

(1) An option based on the August 7, 1995 direct final rule was estimated to cost between \$2.2 billion and \$78.9 billion per year.

(2) A "Plan B" option was estimated to cost between \$0.6 billion and \$3.2 billion per year.

(3) An option based on the September 30, 1996 draft proposed rule was estimated to cost between \$0.2 billion and \$3.7 billion per year.

(4) An option based on the February 13, 1997 draft proposed rule, was estimated to cost between \$0.2 billion and \$3.5 billion.

There are three reasons why the costs for these four options exceeded the estimated cost range for the proposed rule. The first two options regulated substantially more municipal governments. The first, third, and fourth options required industrial facilities to apply for permits. Finally, the first three options applied permit requirements to construction sites below 1 acre. Consequently, these options would be more costly than today's rule even with the revised analysis methods used to estimate costs.

3. Effects on Small Governments

Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements. EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. Although today's rule expands the NPDES program (with modifications) to certain MS4s serving populations below 100,000 and although many MS4s are owned by small governments, EPA does not believe today's rule significantly or uniquely affects small governments. As explained in section IV.E. of the preamble, EPA today certifies that the rule will not have a significant impact on small governmental jurisdictions. In addition, the rule will not have a unique impact on small governments because the rule will affect small governments in

to the same extent as (or to a lesser extent than) larger governments that are already covered by the existing storm water rules. Thus, today's rule is not subject to the requirements of section 203 of UMRA.

Notwithstanding this finding, in developing today's rule, EPA provided notice of the requirements to potentially affected small governments; enabled officials of affected small governments to provide meaningful and timely input in the development of regulatory proposals; and informed, educated and advised small governments on compliance with the requirements.

Concerning notice, EPA provided States, local, and Tribal governments with the opportunity to comment on alternative approaches for an early draft of the proposed rule by publishing a notice requesting information and public comment in the **Federal Register** on September 9, 1992 (57 FR 41344). This notice presented a full range of regulatory alternatives. At that time, EPA received more than 130 comments, including approximately 43 percent from municipalities and 24 percent from State or Federal agencies.

The Agency also provided, through the SBREFA panel process and the FACA process, the opportunity for elected officials of small governments (and their representatives) to meaningfully participate in the development of the rule. Through such participation and exchange, EPA not only notified potentially affected small governments of requirements of the developing rule, but also allowed officials of affected small governments to have meaningful and timely input into the development of regulatory proposals.

In addition to involving municipalities in the development of the rule, EPA also continues to inform, educate, and advise small governments on compliance with the requirements of today's rule. For example, EPA supported 10 workshops, presented by the American Public Works Association from September 1998 through May 1999, designed to educate local governments on the implementation of the rule. The workshop curriculum included information on a variety of key issues such as anticipated regulatory requirements, agency reporting, best management practices, construction site controls, post construction management for new and redeveloped sites, public education and public involvement strategies, detection and control of illicit discharges, and good housekeeping practices. Moreover, EPA has prepared a series of fact sheets, available on the

EPA website at www.epa.gov/owm/sw/toolbox, that explains the rule in detail.

Finally, to assist small governments in implementing the Phase II program, EPA is committed to the following: (1) developing a tool box of implementation strategies; (2) providing written technical assistance, including guidance on developing BMPs and measurable goals; and (3) compiling a comprehensive evaluation of the NPDES municipal storm water Phase II program over the next 13 years.

D. Executive Order 13132

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." Under Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

If EPA complies by consulting, Executive Order 13132 requires EPA to provide to the Office of Management and Budget (OMB), in a separately identified section of the preamble to the rule, a federalism summary impact statement (FSIS). The FSIS must include a description of the extent of EPA's prior consultation with State and local officials, a summary of the nature of their concerns and the agency's position supporting the need to issue the regulation, and a statement of the extent to which the concerns of State and local officials have been met. For final rules subject to Executive Order 13132, EPA also must submit to OMB a statement from the agency's Federalism Official certifying that EPA has fulfilled the Executive Order's requirements.

EPA has concluded that this final rule may have federalism implications. As discussed above in section IV.C., the rule contains a Federal mandate that may result in the expenditure by State, local and tribal governments, in the aggregate, of \$100 million or more in any one year. Accordingly, the rule may have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Moreover, the rule will impose substantial direct compliance costs on State or local governments. Accordingly, EPA provides the following FSIS under section 6(b) of Executive Order 13132.

1. Description of the Extent of the Agency's Prior Consultation with State and Local Governments

Although this rule was proposed long before the November 2, 1999 effective date of Executive Order 13132, EPA consulted extensively with affected State and local governments pursuant to the intergovernmental consultation provisions of Executive Order 12875, "Enhancing the Intergovernmental Partnership" (now revoked by Executive Order 13132) and section 204 of UMRA.

First, EPA provided State and local governments the opportunity to comment on draft alternative approaches for the proposed rule through publishing a notice requesting information and public comment in the **Federal Register** on September 9, 1992 (57 FR 41344). This notice presented a full range of regulatory alternatives. At that time, EPA received more than 130 comments, including approximately 43 percent from municipalities and 24 percent from State or Federal agencies. These comments were the genesis of many of the provisions in the today's rule, including reliance on the NPDES program framework (including general permits), providing State and local governments flexibility in selecting additional sources requiring regulation, and focusing on high priority polluters. These comments helped to focus on pollution prevention, watershed-based concerns and BMPs. They also led to certain exemptions for facilities that do not pollute national waters.

In early 1993, EPA, in conjunction with the Rensselaerville Institute, held public and expert meetings to assist in developing and analyzing options for identifying unregulated storm water sources and possible controls. These meetings provided participants an additional opportunity to provide input into the CWA section 402(p)(6) program

development process. The final rule addresses several of the key concerns identified in these groups, including provisions that provide flexibility to the States to select sources to be controlled and types of permits to be issued, and flexibility to MS4s in selecting BMPs.

EPA also conducted outreach with representatives of small entities, including small governments, in conjunction with the convening of a Small Business Advocacy Review Panel under SBREFA which is discussed in section III.F. of the preamble.

In addition, EPA established the Urban Wet Weather Flows Advisory Committee (FACA), which in turn established the Storm Water Phase II Subcommittee. Consistent with the Federal Advisory Committee Act, the membership of the Committee and the Storm Water Phase II Subcommittee was balanced among EPA's various outside stakeholder interests, including representatives from State governments, municipal governments (both elected officials and appointed officials) and Tribal governments, as well as industrial and commercial sectors, agriculture, environmental and public interest groups.

2. Summary of Nature of State and Local Government Concerns, and Statement of the Extent to Which Those Concerns Have Been Met

In general, municipal government representatives supported the NPDES approach in today's rule for the following reasons: it will be uniformly applied on a nationwide basis; it provides flexibility to allow incorporation of State and local programs; it resolves the problem of donut holes that cause water quality impacts in urbanized areas; and it allows co-permitting of small regulated MS4s with those regulated under the existing storm water program.

In contrast, State representatives sought alternative approaches for State implementation of the storm water program for Phase II sources. State representatives asserted that a non-NPDES alternative approach best facilitated watershed management and avoided duplication and overlapping regulations. These representatives pointed out that there are a variety of State programs—not based on the CWA—implementing effective storm water controls, and that EPA should provide incentives for their implementation and improvement in performance. EPA continues to believe that an NPDES approach is the best approach in order to adequately protect water quality. However, EPA has worked with States on an alternative

approach that provides flexibility within the NPDES framework. The final rule allows States with a watershed permitting approach to phase in permit coverage for MS4s in jurisdictions with a population less than 10,000 and provides two waivers from coverage for small MS4s. This issue is discussed in section II.C of the preamble, Program Framework: NPDES Approach.

Some municipal governments objected that the rule's minimum measures for small MS4s violate the Tenth Amendment insofar as they require the operators of MS4s to regulate third parties according to the "minimum measures" for municipal storm water management programs. EPA disagrees that today's rule is inconsistent with Tenth Amendment principles. Permits issued under today's rule will not compel political subdivisions of States to regulate in their sovereign capacities, but rather to effectively control discharges out of their storm sewer systems in their owner/operator capacities. For MS4s that do not accept this "default" minimum measures-based approach (to control discharges out of the storm sewer system by exercising local powers to control discharges into the storm sewer system), today's rule allows for alternative permits through individual permit applications. EPA made revisions to the rule to allow regulated small MS4s to opt out of the minimum measures approach and instead apply for an individual permit. This issue is discussed in section II.H.3.c.iii of the preamble, Alternative Permit Option/Tenth Amendment.

3. Summary of the Agency's Position Supporting the Need To Issue the Regulation

As discussed more fully in section I.B. above, today's rule is needed because uncontrolled storm water discharges from areas of urban development and construction activity have been shown to have negative impacts on receiving waters by changing the physical, biological, and chemical composition of the water, resulting in an unhealthy environment for aquatic organisms, wildlife, and people. As discussed in section II.C., the NPDES approach in today's rule is needed to ensure uniform application on a nationwide basis, to provide flexibility to allow incorporation of State and local programs, to resolve the problem of donut holes that cause water quality impacts in urbanized areas, and to allow co-permitting of small regulated MS4s with those regulated under the existing storm water program.

The draft final rule was transmitted to OMB on July 6, 1999. Because transmittal occurred before the November 2, 1999 effective date of Executive Order 13132, certification under section 8 of the Executive Order is not required.

E. Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

The RFA generally requires an Agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impact of today's rule on small entities, small entity is defined as: (1) a building contractor (SIC 15) with up to \$17.0 million in annual revenue; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this rule on small entities.

For purposes of evaluating the economic impact of this rule on small governmental jurisdictions, EPA compared annual compliance costs with annual government revenues obtained from the 1992 Census of Governments, using state-specific estimates of annual revenue per capita for municipalities in three population size categories (fewer than 10,000, 10,000–25,000, and 25,000–50,000).

In order to estimate the annual compliance cost for small governmental jurisdictions, EPA used the mean variable municipal cost of \$8.93 per household as calculated in a 1998 study of 121 municipalities conducted by the national Association of Flood and Stormwater Management Agencies (NAFSMA). In addition, EPA used the estimated fixed administrative costs of \$1,545 per municipality for reporting,

recordkeeping, and application requirements for today's rule.

In evaluating the economic impact of this rule on small governmental jurisdictions, EPA determined that compliance costs represent more than 1 percent of estimated revenues for only 10 percent of small governments and more than 3 percent of the revenue for 0.7 percent of these entities. In both absolute and relative terms, EPA does not consider this a significant economic impact on a substantial number of small entities.

EPA normally uses the "sales test" for determining the economic impact on small businesses. Under a sales test, annual compliance costs are compared with the small business's total annual sales. However, the direct application of the sales test is not suitable in this case, because of the uncertainty associated with estimating the number of units an "average" developer/contractor develops or builds in a typical year. For this rule, EPA has approximated the sales test by estimating compliance costs for three sizes of construction sites and comparing them with a representative sale price for three building categories. Although EPA's analysis is not exactly a "sales test," it is similar to the sales test, producing comparable results.

For small building contractors, EPA estimated administrative compliance costs of \$870 per site for applying for coverage, reporting, record keeping, monitoring and preparing a storm water pollution prevention plan. EPA estimated compliance costs for installing soil and erosion controls as ranging from \$1,206 to \$8,709 per site. EPA compliance cost estimates are based on 27 theoretical model construction sites designed to mimic the mostly likely used best management practices around the country.

In evaluating the economic impact on small building contractors, EPA divided the revised compliance costs per construction start by the appropriate homes-to-site ratio for each of the three sizes of construction sites. The average compliance cost per home ranges from approximately \$450 to \$650. EPA concluded that compliance costs are roughly 0.22 to 0.43 percent of both the mean, \$181,300, and median, \$151,000, sale price of a home.

The absence of data to specifically assess annual compliance costs for building contractors as a percentage of annual sales (i.e., a very direct estimate of the impact on potentially affected small businesses) led EPA to perform additional market analysis to examine the ability of potentially affected firms to pass along regulatory costs to buyers

for single-family homes constructed subject to today's rule. If the small building contractors covered by the rule are able to pass on the costs of compliance, either completely or partially, to their purchasers, then the rule's impact on these small business entities is significantly reduced. The market analysis shows that demand for homes is not overly sensitive to small changes in price, therefore builders should be able to pass on at least a significant fraction of the compliance costs to buyers.

EPA also assessed the effect of the building contractors' costs on average monthly mortgage rates and on the demand for new homes. Based on that screening analysis, EPA concludes that the costs to building contractors, and the potential changes in housing prices and monthly mortgage payments for single-family home buyers, are not expected to have a significant impact on the market for single-family houses. In both absolute and relative terms, EPA does not consider this a significant economic impact on a substantial number of small entities.

EPA also certified this rule at proposal. Even though the Agency was not required to, we convened a Small Business Advocacy Review Panel ("Panel") in June 1997. A number of small entity representatives had already been actively involved with EPA through the FACA process, and were, therefore, broadly knowledgeable about the development of the proposed and final rules. Prior to convening the Panel, EPA consulted with the Small Business Administration to identify a group of small entity representatives to advise the Panel. The Agency distributed a briefing package describing its preliminary analysis under the RFA to the small entity representatives (as well as to representatives from OMB and SBA) and conducted two telephone conference calls and an all-day meeting at EPA Headquarters in May of 1997 with small entity representatives. With this preliminary work complete, in June 1997, EPA formally convened the SBREFA Panel, comprising representatives from OMB, SBA, EPA's Office of Water and EPA's Small Business Advocacy Chair. The Panel received written comments from small entity representatives based on their involvement in the earlier meetings, and invited additional comments.

Consistent with requirements of the RFA, the Panel evaluated the assembled materials and small-entity comments on issues related to: (1) a description and the number of small entities that would be regulated; (2) a description of the projected record keeping, reporting and

other compliance requirements applicable to small entities; (3) identification of other Federal rules that may duplicate, overlap, or conflict with the proposal to the final rule; and (4) regulatory alternatives that would minimize any significant economic impact of the rule on small entities while accomplishing the stated objectives of the CWA section 402(p)(6).

On August 7, 1997, the Panel provided a Final Report (hereinafter, "Report") to the EPA Administrator. A copy of the Report is included in the docket for the rule. The Panel acknowledged and commended EPA's efforts to work with stakeholders, including small entities, through the FACA process. The SBREFA Panel stated that, because of EPA's extensive outreach and responsiveness in addressing stakeholder concerns, commenters during the SBREFA process raised fewer concerns than might otherwise have been expected. Based on the advice and recommendations of the Panel, today's rule includes a number of provisions designed to minimize any significant impact on small entities. (See Appendix 5).

F. National Technology Transfer And Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law 104-113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action does not mandate the use of any particular technical standards, although in designing appropriate BMPs regulated small MS4s and small construction sites are encouraged to use any voluntary consensus standards that may be applicable and appropriate. Because no specific technical standards are included in the rule, section 12(d) of the NTTAA is not applicable.

G. Executive Order 13045

Executive Order 13045: "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be "economically

significant” as defined under E.O. 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to E.O. 13045 because it does not concern an environmental health or safety risk that may have a disproportionate effect on children. The rule expands the scope of the existing NPDES permitting program to require small municipalities and small construction sites to regulate their storm water discharges. The rule does not itself, however, establish standards or criteria that would be included in permits for those sources. Such standards or criteria will be developed through other actions, for example, in the establishment of water quality standards or subsequently in the issuance of permits themselves. As such, today’s action does not concern an environmental health or safety risk that may have a disproportionate effect on children. To the extent it does address a risk that may have a disproportionate effect on children, expanding the scope of the permitting program will have a corresponding disproportionate benefit to children to protect them from such risk.

H. Executive Order 13084

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the Tribal

governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA’s prior consultation with representatives of affected Tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian Tribal governments “to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.”

Today’s rule does not significantly or uniquely affect the communities of Indian Tribal governments. Even though the Agency is not required to address Tribes under the Regulatory Flexibility Act, EPA used the same revenue test that was used for municipalities to assess the impact of the rule on communities of Tribal governments and determine that they will not be significantly affected. In addition, the rule will not have a unique impact on the communities of Tribal governments because small municipal governments are also covered by this rule and larger municipal governments are already covered by the existing storm water rules. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

I. Congressional Review Act

The Congressional Review Act, 5 U.S.C. section 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress

and the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This rule is a “major rule” as defined by 5 U.S.C. 804(2). This rule will be effective on February 7, 2000.

List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 122

Administrative practice and procedure, Confidential business information, Environmental protection, Hazardous substances, Incorporation by reference, Reporting and recordkeeping requirements, Sewage disposal, Waste treatment and disposal, Water pollution control.

40 CFR Part 123

Administrative practice and procedure, Confidential business information, Hazardous materials, Indians—lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Sewage disposal, Waste treatment and disposal, Water pollution control, Penalties.

40 CFR Part 124

Administrative practice and procedure, Air pollution control, Hazardous waste, Indians—lands, Reporting and recordkeeping requirements, Water pollution control, Water supply.

Dated: October 29, 1999.

Carol M. Browner,
Administrator.

Appendices to the Preamble

APPENDIX 1 TO PREAMBLE—FEDERALLY-RECOGNIZED AMERICAN INDIAN AREAS LOCATED FULLY OR PARTIALLY IN BUREAU OF THE CENSUS URBANIZED AREAS

[Based on 1990 Census data]

State	American Indian Area	Urbanized Area
AZ	Pascua Yacqui Reservation (pt.): Pascua Yacqui Tribe of Arizona	Tucson, AZ (Phase I).
AZ	Salt River Reservation (pt.): Salt River Pima-Maricopa Indian Community of the Salt River Reservation, California.	Phoenix, AZ (Phase I).
AZ	San Xavier Reservation (pt.): Tohono O’odham Nation of Arizona (formerly known as the Papago Tribe of the Sells, Gila Bend & San Xavier Reservation).	Tucson, AZ (Phase I).
CA	Augustine Reservation: Augustine Band of Cahuilla Mission of Indians of the Augustine Reservation, CA.	Indio-Coachella, CA (Phase I).
CA	Cabazon Reservation: Cabazon Band of Cahuilla Mission Indians of the Cabazon Reservation, CA.	Indio-Coachella, CA (Phase I).

ATTACHMENT 8

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 122

[EPA-HQ-OW-2015-0671; FRL-9955-11-OW]

RIN 2040-AF57

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System General Permit Remand Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is revising the regulations governing regulated small municipal separate storm sewer system (MS4) permits to respond to a remand from the United States Court of Appeals for the Ninth Circuit in *Environmental Defense Center, et al. v. EPA*, 344 F.3d 832 (9th Cir. 2003). In that decision, the court determined that the regulations for providing coverage under small MS4 general permits did not provide for adequate public notice and opportunity to request a hearing. Additionally, the court found that EPA failed to require permitting authority review of the best management practices (BMPs) to be used at a particular MS4 to ensure that the small MS4 permittee reduces pollutants in the discharge from their systems to the “maximum extent practicable” (MEP), the standard established by the Clean Water Act (CWA) for such permits. The final rule establishes two alternative approaches a permitting authority can use to issue National Pollutant Discharge Elimination (NPDES) general permits for small MS4s and meet the requirements of the court remand. The first option is to establish all necessary permit terms and conditions to require the MS4 operator to reduce the discharge of pollutants from its MS4 to the MEP, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act (“MS4 permit standard”) upfront in one comprehensive permit. The second option allows the permitting authority to establish the necessary permit terms and conditions in two steps: A first step to issue a base general permit that contains terms and conditions applicable to all small MS4s covered by the permit and a second step to establish necessary permit terms and conditions for individual MS4s that are not in the base general permit. Public notice and comment and opportunity to request a hearing would be necessary for

both steps of this two-step general permit. This final rule does not establish any new substantive requirements for small MS4 permits.

DATES: This final rule is effective on January 9, 2017.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA-HQ-OW-2015-0671. All documents in the docket are listed on the <http://www.regulations.gov> Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through <http://www.regulations.gov>.

FOR FURTHER INFORMATION CONTACT: Greg Schaner, Office of Wastewater Management, Water Permits Division (4203M), Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460; telephone number: (202) 564-0721; email address: schaner.greg@epa.gov. Refer also to EPA’s Web site for further information related to the final rule at <https://www.epa.gov/npdes/stormwater-rules-and-notices#proposed>.

SUPPLEMENTARY INFORMATION: The **Federal Register** published EPA’s proposed rule on January 6, 2016 (81 FR 415).

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K. Congressional Review Act

I. General Information

A. Does this action apply to me?

Entities regulated [or affected] by this rule include:

Category	Examples of regulated entities	North American industry classification system (NAICS) code
Federal and state government	EPA or state NPDES stormwater permitting authorities; operators of small municipal separate storm sewer systems.	924110
Local governments	Operators of small municipal separate storm sewer systems	924110

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated or otherwise affected by this action. Other types of entities not listed in the table could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria found in 40 CFR 122.32, and the discussion in the preamble. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the Agency taking?

EPA is issuing a final rule to revise its regulations governing the way in which small municipal separate storm sewer systems (MS4s) obtain coverage under National Pollutant Discharge Elimination System (NPDES) general permits and how required permit conditions are established. The rule results from a decision by the U.S. Court of Appeals for the Ninth Circuit in *Environmental Defense Center, et al. v. EPA*, at 344 F.3d 832 (9th Cir. 2003) (“EDC decision”), which found that EPA regulations for obtaining coverage under a small MS4 general permit did not provide for adequate public notice, the opportunity to request a hearing, or permitting authority review to determine whether the best management practices (BMPs) selected by each MS4 in its stormwater management program (SWMP) meets the CWA requirements including the requirement to “reduce pollutants to the maximum extent practicable.” The **Federal Register** published EPA’s proposed rule on January 6, 2016 (81 FR 415). EPA proposed and solicited public comment on three options for addressing the remand. One option (called the “Traditional General Permit Approach”) would require the permitting authority to establish within the general permit all

requirements necessary for the regulated small MS4s to meet the applicable permit standard (to reduce pollutants to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the CWA), which would be subject to public notice and comment and an opportunity to request a hearing. The second proposed option (called the “Procedural Approach”) would require the permitting authority to incorporate an additional review and public comment step into the existing Phase II regulatory framework for permitting small MS4s through general permits. More specifically, once an MS4 operator submitted its Notice of Intent (NOI) requesting coverage under the general permit, an additional step would take place in which the permitting authority would review, and the public would be given an opportunity to comment and request a hearing on, the merits of the MS4’s proposed BMPs and measurable goals for complying with the requirement to reduce discharges to the MEP, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA. A third proposed option (called the “State Choice Approach”) would enable the permitting authority to choose between the Traditional General Permit and Procedural Approaches, or to implement a combination of these approaches in issuing and authorizing coverage under a general permit. Today, EPA is issuing a rule that promulgates the “State Choice Approach” and has renamed it as the “Permitting Authority Choice Approach.”

C. What is the Agency’s authority for taking this action?

The authority for this rule is the Federal Water Pollution Control Act, 33 U.S.C. 1251 *et seq.*, including sections 402 and 501.

D. What are the incremental costs of this action?

The Economic Analysis estimates the incremental costs to implement the final rule. EPA assumed that all other costs accrued as a result of the existing small MS4 program, which were accounted for in the Economic Analysis accompanying the 1999 final Phase II MS4 regulations, remain the same and are not germane to the Economic Analysis, unless the rule change would affect the baseline program costs. In this respect, EPA focused only on new costs that may be imposed as a result of implementing the final rule. It is, therefore, unnecessary to reevaluate the total program costs of the Phase II rule, since those costs were part of the original economic analysis conducted for the 1999 Phase II rule (see 64 FR 68722, December 8, 1999). For further information, refer to the Economic Analysis that is included in the rule docket.

EPA estimates the annualized cost of the final rule to be between \$558,025 and \$604,770, depending on the assumed discount rate. This can be thought of as the annual budgeted amounts each permitting authority would need to make available each year in order to be able to cover the increase in permitting authority efforts that would result every 5 years. The total net present value of the compliance cost ranges from \$5.5 million to \$8.4 million, depending on the assumed discount rate. These estimates are all below the threshold level established by statute and various executive orders for determining that a rule has an economically significant or substantial impact on affected entities. See further discussion in Section X of this preamble.

The Economic Analysis assumes that permitting authorities are the only entities that are expected to be impacted from this rule because the requirements modified by the rule focus only on the administrative manner in which general

permits are issued and how coverage under those permits is granted. EPA emphasizes that this final rule does not change the stringency of the underlying requirements in the statute or Phase II regulations to which small MS4 permittees are subject, nor does it establish new substantive requirements for MS4 permittees. Therefore, the Economic Analysis does not attribute new costs to regulated small MS4s beyond what they are already subject to under the statute and Phase II regulations. EPA acknowledges that many permitting authorities consider permitting a cost-neutral function, therefore some may increase permit fees to cover the increased costs associated with this rule.

EPA used conservative assumptions about impacts on state workloads, meaning that the actual economic costs of complying with the final rule and implementing any new procedural changes are most likely lower than what is actually presented. EPA considers the cost assumptions to be conservative because as more permitting authorities issue general permits consistent with the new rule, other permitting authorities can use and build on those examples, reducing the amount of time it takes to draft the permit requirements, and permitting authorities will likely learn from experience as they move forward how to work more efficiently to issue and administer their general permits. EPA has issued guidance to permitting authorities on how to write better MS4 permits (*MS4 Permit Improvement Guide* (EPA, 2010); *Compendium of MS4 Permitting Approaches—Part 2: Post Construction Standards* (EPA, 2016); *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016)), and additional examples of permit provisions that are written in a “clear, specific, and measurable” manner for the six minimum control measures are included in the preamble to this rule. EPA also anticipates issuing further guidance once the rule is promulgated to assist permitting authorities in implementing the new rule requirements, which will in turn hopefully make permit writing more efficient. These gained efficiencies were not, however, accounted for in the option-specific cost assumptions.

II. Background

A. Statutory and Regulatory Overview

Stormwater discharges are a significant cause of water quality impairment because they can contain a variety of pollutants such as sediment, nutrients, chlorides, pathogens, metals,

and trash that are mobilized and ultimately discharged to storm sewers or directly to water bodies. Furthermore, the increased volume and velocity of stormwater discharges that result from the creation of impervious cover can alter streams and rivers by causing scouring and erosion. These surface water impacts can threaten public health and safety due to the increased risk of flooding and increased level of pollutants; can lead to economic losses to property and fishing industries; can increase drinking water treatment costs; and can decrease opportunities for recreation, swimming, and wildlife uses.

Stormwater discharges are subject to regulation under section 402(p) of the CWA. Under this provision, Congress required the following stormwater discharges initially to be subject to NPDES permitting requirements: Stormwater discharges for which NPDES permits were issued prior to February 4, 1987; discharges “associated with industrial activity”; discharges from MS4s serving populations of 100,000 or more; and any stormwater discharge determined by EPA or a state to “contribute . . . to a violation of a water quality standard or to be a significant contributor of pollutants to waters of the United States.” Congress further directed EPA to study other stormwater discharges and determine which needed additional controls. With respect to MS4s, section 402(p)(3)(B) provides that NPDES permits may be issued on a system-wide or jurisdiction-wide basis, and requires that MS4 NPDES permits “include a requirement to effectively prohibit non-stormwater discharges into the storm sewers” and require “controls to reduce the discharge of pollutants to the maximum extent practicable . . . and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.”

EPA developed the stormwater regulations under section 402(p) of the CWA in two phases, as directed by the statute. In the first phase, under section 402(p)(4) of the CWA, EPA promulgated regulations establishing application and other NPDES permit requirements for stormwater discharges from medium (serving populations of 100,000 to 250,000) and large (serving populations of 250,000 or more) MS4s, and stormwater discharges associated with industrial activity. EPA published the final Phase I rule on November 16, 1990 (55 FR 47990). The Phase I rule, among other things, defined “municipal separate storm sewer” as publicly-owned conveyances or systems of conveyances that discharge to waters of

the U.S. and are designed or used for collecting or conveying stormwater, are not combined sewers, and are not part of a publicly-owned treatment works at § 122.26(b)(8). EPA included construction sites disturbing five acres or more in the definition of “stormwater discharges associated with industrial activity” at § 122.26(b)(14)(x).

In the second phase, section 402(p)(5) and (6) of the CWA required EPA to conduct a study to identify other stormwater discharges that needed further controls “to protect water quality,” report to Congress on the results of the study, and to designate for regulation additional categories of stormwater discharges not regulated in Phase I on the basis of the study and in consultation with state and local officials. EPA promulgated the Phase II rule on December 8, 1999, designating discharges from certain small MS4s and from small construction sites (disturbing equal to or greater than one acre and less than five acres) and requiring NPDES permits for these discharges (64 FR 68722, December 8, 1999). A regulated small MS4 is generally defined as any MS4 that is not already covered by the Phase I program and that is located within the urbanized area boundary as determined by the latest U.S. Decennial Census. Separate storm sewer systems such as those serving military bases, universities, large hospitals or prison complexes, and highways are also included in the definition of “small MS4.” See § 122.26(b)(16). In addition, the Phase II rule includes authority for EPA (or states authorized to administer the NPDES program) to require NPDES permits for currently unregulated stormwater discharges through a designation process. See § 122.26(a)(9)(i)(C) and (D). Other small MS4s located outside of an urbanized area may be designated as a regulated small MS4 if the NPDES permitting authority determines that its discharges cause, or have the potential to cause, an adverse impact on water quality. See §§ 122.32(a)(2) and 123.35(b)(3).

B. MS4 Permitting Requirements

The Phase I regulations are primarily comprised of requirements that must be addressed in applications for individual permits from large and medium MS4s. The regulations at § 122.26(d)(2)(iv) require these MS4s to develop a proposed stormwater management program (SWMP), which is considered by EPA or the authorized state permitting authority when establishing permit conditions to reduce pollutants to the “maximum extent practicable” (MEP).

Like the Phase I rule, the Phase II rule requires regulated small MS4s to develop and implement SWMPs. The regulations at § 122.34(a) requires that SWMPs be designed to reduce pollutants discharged from the MS4 “to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act,” and requires that the SWMPs include six “minimum control measures.” The minimum control measures are: Public education and outreach, public participation and involvement, illicit discharge detection and elimination, construction site runoff control, post construction runoff control, pollution prevention and good housekeeping. See § 122.34(b). Under the Phase II rule, a regulated small MS4 may seek coverage under an available general permit or may apply for an individual permit. To be authorized to discharge under a general permit, the rule requires submission of a Notice of Intent (NOI) to be covered by the general permit containing a description of the best management practices (BMPs) to be implemented and the measurable goals for each of the BMPs, including timing and frequency, as appropriate. See §§ 122.33(a)(1), 122.34(d)(1).

EPA anticipated that under the first two or three permit cycles, whether required in individual permits or in general permits, BMP-based controls implementing the six minimum control measures would, if properly implemented, “be sufficiently stringent to protect water quality, including water quality standards, so that additional, more stringent and/or more prescriptive water quality based effluent limitations will be unnecessary.” (64 FR 68753, December 8, 1999). In the final Phase II rule preamble, EPA also stated that it “has intentionally not provided a precise definition of MEP to allow maximum flexibility in MS4 permitting. MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis. . . . Therefore, each permittee will determine appropriate BMPs to satisfy each of the six minimum control measures through an evaluative process.” (64 FR 68754, December 8, 1999).

The agency described the approach to meet the MS4 permit standard in the preamble to the Phase II rule as an “iterative process” of developing, implementing, and improving stormwater control measures contained in SWMPs. As EPA further stated in the preamble to the Phase II rule, “MEP should continually adapt to current conditions and BMP effectiveness and

should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards. . . . If, after implementing the six minimum control measures there is still water quality impairment associated with discharges from the MS4, after successive permit terms the permittee will need to expand or better tailor its BMPs within the scope of the six minimum control measures for each subsequent permit.” (64 FR 68754, December 8, 1999).

C. Judicial Review of the Phase II Rule and Partial Remand

The Phase II rule was challenged in petitions for review filed by environmental groups, municipal organizations, and industry groups, resulting in a partial remand of the rule. *Environmental Defense Center v. U.S. Environmental Protection Agency*, 344 F.3d. 832 (9th Cir. 2003) (*EDC*). The court remanded the Phase II rule’s provisions for small MS4 general permits because they lacked procedures for permitting authority review and public notice and the opportunity to request a hearing on NOIs submitted under general MS4 permits.

In reviewing how the Phase II rule provided for general permit coverage for small MS4s, the court found that the way in which NOIs function under the rule was not the same as in other NPDES general permits. Other general permits contain within the body of the general permit the specific effluent limitations and conditions applicable to the class of dischargers for which the permit is available. In this situation, authorization to discharge under a general permit is obtained by filing an NOI in which the discharger agrees to comply with the terms of the general permit and in which the operator provides some basic information (*e.g.*, site location, receiving waters) to help determine eligibility. In contrast, the court held that under the Phase II rule, because the NOI submitted by the MS4 contains the information describing what the MS4 will do to reduce pollutants to the MEP, it is the “functional equivalent” of an individual permit application. See *EDC*, 344 F.3d. at 857. Because the CWA requires public notice and the opportunity to request a public hearing for all permit applications, the court held that failure to require public notice and the opportunity for a public hearing for NOIs under the Phase II rule is contrary to the Act. See *EDC*, 344 F.3d. at 858.

Similarly, the court found the Phase II rule allows the MS4 to identify the

BMPs that it will undertake in its SWMP without any permitting authority review. The court held that the lack of review “to ensure that the measures that any given operator of a small MS4 has decided to undertake will *in fact* reduce discharges of pollutants to the maximum extent practicable” also does not comport with CWA requirements. The court stated, “That the Rule allows a permitting authority to review an NOI is not enough; every permit must comply with the standards articulated by the Clean Water Act, and unless every NOI issued under general permit is reviewed, there is no way to ensure that such compliance has been achieved.” See *EDC*, 344 F.3d. at 855 n.32. The court therefore vacated and remanded “those portions of the Phase II Rule that address these procedural issues . . . so that EPA may take appropriate action to comply with Clean Water Act.” See *EDC*, 344 F.3d. at 858.

III. Summary of the Proposed Rule and Comments Received

A. Scope of the Proposed Rule

EPA proposed revisions to the Phase II MS4 NPDES permitting requirements on January 6, 2016 (81 FR 415) to respond to the Ninth Circuit’s remand in *Environmental Defense Center v. U.S. Environmental Protection Agency*, 344 F.3d. 832 (9th Cir. 2003). To address the remand, the regulations must ensure that permitting authorities determine what permit requirements are needed to reduce pollutants from each permitted small MS4 “to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act” (referred to hereinafter as the “MS4 permit standard”). The rule must also require NPDES permitting authorities to provide the public with the opportunity to review, submit comments, and request a public hearing on these permit requirements. EPA did not propose modifications to any of the substantive requirements that were promulgated in the Phase II rule (nor did EPA reopen or seek comment on any aspect of the Phase I rule, which was described in the preamble of the proposed rule for informational purposes only).

In the remand decision, the court established in broad and clear terms what is needed for general permits that cover regulated small MS4s and therefore provided EPA with what minimum attributes should be part of any revisions to the Phase II regulations. The court stated that “every permit must comply with the standards articulated by the Clean Water Act, and

unless every NOI issued under a general permit is reviewed, there is no way to ensure that such compliance has been achieved.” See *EDC*, 344 F.3d at 855, n. 32. In the court’s view, the NOI served as the document that established how the MEP standard would be met: “Because a Phase II NOI establishes what the discharger will do to reduce discharges to the ‘maximum extent practicable,’ the Phase II NOI crosses the threshold from being an item of procedural correspondence to being a substantive component of a regulatory scheme.” See *EDC*, 344 F.3d at 853. Since review of the NOI by the permitting authority was not specified in the regulation, and § 122.34(a) stated that compliance with the storm water management program developed by the permittee constituted compliance with the MEP standard, the court also expressed concern that the regulation put the MS4 in charge of establishing its own requirements. “[U]nder the Phase II Rule nothing prevents the operator of a small MS4 from misunderstanding or misrepresenting its own stormwater situation and proposing a set of minimum measures for itself that would reduce discharges by far less than the maximum extent practicable.” See *EDC*, 344 F.3d at 855. Further, the court found that the failure to require public notice or opportunity to submit comments or request a public hearing for each NOI violated requirements applicable to all CWA permits in accordance with section 402(b)(3). See *EDC*, 344 F.3d at 857.

B. Description of Options Proposed

EPA proposed for comment the following three options to address the regulatory shortcomings found in the remand decision.

1. Option 1 (“Traditional General Permit Approach”)

Under the proposed Traditional General Permit Approach, the permitting authority must establish in any small MS4 general permit the full set of requirements that are deemed necessary to meet the MS4 permit standard (“reduce pollutants to the maximum extent practicable, protect water quality and satisfy the appropriate water quality requirements of the Clean Water Act”), and the administrative record would include an explanation of the rationale for its determination. (This approach contrasts with the original regulations, which appeared to the court to provide the permittee with the ability to establish its own requirements.) Once the permit is issued, and the terms and conditions in the permit are fixed for the term of the permit, neither the

development of a SWMP document nor the submittal of an NOI for coverage would represent new permit requirements. Thus, because the permit contains all of the requirements that will be used to assess permittee compliance, the permitting authority would no longer need to rely on the MS4’s NOI as the mechanism for ascertaining what will occur during the permit term. Under this approach, the function of the NOI would be more similar to that of any other general permit NOI, and more specifically other stormwater general permits, whereby the NOI is used to establish certain minimum facts about the discharger, including the operator’s contact details, the discharge location(s), and confirmation that the operator is eligible for permit coverage and has agreed to comply with the terms of the permit. By removing the possibility that effluent limits could be proposed in the NOI (and for that matter in the SWMP) and made part of the permit once permit coverage is provided, the NOI would no longer look and function like an individual permit application, as the court found with respect to MS4 NOIs under the Phase II regulations currently in effect. Therefore, it would not be necessary to carry out the type of additional permitting authority review and public participation procedures contemplated by the Ninth Circuit court in the remand decision. These requirements would be met during the process of issuing the general permit.

2. Option 2 (“Procedural Approach”)

Under the proposed Procedural Approach, the permitting authority would establish applicable permit requirements to meet the MS4 permit standard by going through a second permitting step following the issuance of the general permit (referred to as the “base general permit”), similar to the procedures used to issue individual NPDES permits. Eligible MS4 operators would be required to submit NOIs with the same information that has always been required under the Phase II regulations, that is, a description of the BMPs to be implemented by the MS4 operator during the permit term, and the measurable goals associated with each BMP. Following the receipt of the NOI, the permitting authority would review the NOI to assess whether the proposed BMPs and measurable goals meet the MS4 permit standard. If not, the permitting authority would request supplemental information or revisions as necessary to ensure that the submission satisfies the regulatory requirements. Once satisfied with the submission, the permitting authority

would be required to propose incorporating the BMPs and measurable goals in the NOI as permit requirements and to provide public notice of the NOI and an opportunity to submit comments and to request a hearing in accordance with §§ 124.10 through 124.13. After consideration of comments received and a hearing, if held, the permitting authority would provide notice of its decision to authorize coverage under the general permit, along with any MS4-specific requirements established during this second process. Upon completion of this process, the MS4 would be required to comply with the requirements set forth in the base general permit and the additional terms and conditions established through the second-step process.

3. Option 3 (“State Choice Approach”)

The proposed rule also requested comment on a State Choice Approach, which would allow permitting authorities to choose either the Traditional General Permit Approach or the Procedural Approach, or some combination of the two as would best suit their needs and circumstances. As described in the proposed rule, the permitting authority could, for example, choose to use Option 1 for small MS4s that have fully established programs and uniform core requirements, and Option 2 for MS4s that it finds would benefit from the additional flexibility to address unique circumstances, such as those encountered by non-traditional MS4s (*e.g.*, state departments of transportation, public universities, military bases). Alternatively, a state could apply a hybrid of the two approaches within one permit by defining some elements within the general permit, which, consistent with the Option 1 approach, are deemed to meet the MS4 permit standard, and establishing additional permit requirements through the Option 2 procedural approach for each MS4 seeking coverage under the General Permit. Under a hybrid approach, any requirements established in the general permit that fully articulate what is required to meet the MS4 permit standard would require no further permitting authority review and public notice proceedings; however, for any terms and conditions established for individual MS4s based in part on information submitted with the NOI would need to follow the Option 2 approach for incorporating these requirements into the permit as enforceable requirements.

C. General Summary of Comments Received

EPA received about 70 unique comments on the proposed rule from the MS4 community, states, environmental groups, industry associations, and engineering firms. Most commenters favored Option 3—the “State Choice” option. While several expressed support for their states using the Traditional General Permit or Procedural Approach, a number of these same commenters acknowledged that these approaches would likely not work in all situations if EPA were to adopt either one as the sole option under the final rule. EPA notes that while most of the environmental organization commenters expressed support for a hybrid option, which technically falls under the State Choice option, they also strongly recommended mandating that the Traditional General Permit Approach be used for permit requirements related to the six minimum control measures and that the Procedural Approach be used for water quality-based requirements, such as requirements for implementing total maximum daily loads (TMDLs).

A common reason given for supporting the State Choice approach included the flexibility it would give authorized states to use different options to address different situations and that it would minimize disruption to existing programs. Several states that now use a traditional general permit approach or a procedural approach stressed the importance of providing choices for other states. EPA notes that no commenter expressly opposed the State Choice approach. EPA discusses these comments in the context of its decision to adopt the State Choice approach in the final rule in Section IV of the preamble below.

EPA received a significant number of comments concerning its proposed changes to the way in which permit terms and conditions must be expressed, particularly with respect to the proposed deletion of the word “narrative” in § 122.34(a). These comments focused on the concern that EPA was moving away from support of the use of BMPs to comply with stormwater permits and from the longstanding “iterative approach” to meeting MS4 permit requirements. EPA discusses these comments and the changes made in response to these comments in the final rule in Section V of the preamble.

In addition to responding to major comments in the preamble, EPA has prepared a Response to Comment

document, which can be found in the docket for this rulemaking.

IV. Summary of the Final Rule

A. Selection of the “Permitting Authority Choice” Approach

EPA is selecting proposed Option 3 (the “State Choice Approach”) for the final rule, described in Section III.B.3. The new name for this option better captures the universe of entities that will implement the rule, *i.e.*, any NPDES permitting authority including EPA Regions and authorized states. Under this approach, the NPDES permitting authority may choose between two alternative means of establishing permit requirements in general permits for small MS4s. The final rule amends § 122.28(d) to require permitting authorities to choose one of these two types of general permits whenever issuing a small MS4 general permit. Permitting authorities are required to select either the “Comprehensive General Permit” or “Two-Step General Permit”. The “Comprehensive General Permit” is essentially the “Traditional General Permit”, or “Option 1”, from the proposed rule. The “Two-Step General Permit” encompasses both the “Procedural Approach”, or “Option 2” and the “hybrid approach” that was described as part of “Option 3” from the proposed rule. The Two-Step General Permit allows the permitting authority to establish some requirements in the general permit and others applicable to individual MS4s through a second proposal and public comment process.

B. Description of the Two Permitting Alternatives Under the Permitting Authority Choice Approach

As described in Section IV.A, the Permitting Authority Choice Approach requires permitting authorities to choose between two alternative approaches to issue general permits for small MS4s. These two types of general permits are described briefly as follows:

- *Comprehensive General Permit*—For this type of general permit, the permitting authority issues a small MS4 general permit that includes the full set of requirements necessary to meet the MS4 permit standard of “reducing pollutant discharges from the MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the CWA.” Under the Comprehensive General Permit, all requirements are contained within the general permit, and no additional requirements are established after permit issuance, as is the case with the “Two-Step General Permit” described

below. For this reason, to provide coverage to eligible small MS4s, the permitting authority can use a traditional general permit NOI as described in § 122.28(b)(2)(ii), and does not need to require additional information from each operator concerning how they will comply with the permit, for instance the BMPs that will be implemented and the measurable goals for each control measure, as a prerequisite to authorizing the discharge. See further discussion of the role of the NOI in Section IV.E.

- *Two-Step General Permit (combination of the proposed Procedural and Hybrid Approaches)*—For the Two-Step General Permit, after issuing a base general permit, the permitting authority establishes through the completion of a second permitting step additional permit terms and conditions that are necessary to meet the MS4 permit standard for each MS4 seeking authorization to discharge under the general permit. These additional terms and conditions supplement the requirements of the general permit for individual MS4 permittees. It is in the second permitting step where the permitting authority satisfies its obligation to review the NOI for adequacy, determine what additional requirements are needed for the MS4 to meet the MS4 permit standard, and provide public notice and an opportunity for the public to submit comments and to request a hearing. See discussion of the second permitting step in Section V.B. Upon completion of this process, the MS4 permittee is authorized to discharge subject to the terms of the general permit and the additional requirements that apply individually to that MS4.

The Two-Step General Permit encompasses the “hybrid” approach described in the proposed rule (see Section VI.C), where the permitting authority includes specific permit terms and conditions within the base general permit, but also establishes additional requirements to meet the MS4 permit standard through a second permitting step. For the final rule, EPA intentionally used rule language that would enable permitting authorities to use a Two-Step General Permit to implement a hybrid approach by referring to both “required permit terms and conditions in the general permit applicable to all eligible small MS4s” and “additional terms and conditions to satisfy one or more of the permit requirements in § 122.34 for individual small MS4 operators.” See § 122.28(d)(2).

The final rule requires that the permitting authority indicate which

type of general permit it is using for any small MS4 general permit. This statement or explanation may be included in the general permit itself or in the permit fact sheet. EPA notes that the permitting authority may choose to change the permitting approach for subsequent permits. Questions concerning when the final rule change takes effect are discussed in Section VIII.A.

C. Summary of Regulatory Changes To Adopt the Permitting Authority Choice Approach

The final rule implements the Permitting Authority Choice option in several different sections of the NPDES regulations. Below is a brief summary of the most significant changes and where they can be found in the final rule:

- **Permitting Authority Choice Approach (§ 122.28(d)):** The final rule adds a new paragraph (d) to § 122.28 that requires the permitting authority to select between two alternative general permits. This section describes both types of general permits (the “Comprehensive General Permit” and the “Two-Step General Permit”) and the minimum requirements associated with each. EPA chose to include the Permitting Authority Choice in a different section of the regulations than was proposed. EPA determined upon further consideration that rather than including all of the requirements within the application and NOI section of the Phase II regulations now at § 122.33, the two alternatives comprising the Permitting Authority Choice Approach fit better within the general permit regulations as a unique set of requirements affecting general permits for regulated small MS4s.

- **Changes to the NOI requirements (§ 122.33):** The final rule includes modifications to the requirements for what must be included in NOIs submitted for coverage under small MS4 general permits. The required contents of the NOI vary depending on the type of general permit used. For permitting authorities choosing a Comprehensive General Permit, the final rule enables the permitting authority to reduce the information required in NOIs to the minimum information required for any general permit NOI in § 122.28(b)(2)(ii). See § 122.33(b)(1)(i). For permitting authorities choosing the Two-Step General Permit, the final rule provides the permitting authority with the ability to determine what information it deems necessary to establish individual requirements for MS4 operators that meet the MS4 permit standard. See § 122.33(b)(1)(ii), and additional

discussion of these and other changes to § 122.33 in Section V.D.1.

- **Clarifications to the requirements for small MS4 permits (§ 122.34):** Regardless of the permitting approach chosen by the NPDES authority, the terms and conditions of the resulting general permits must adhere to the requirements of § 122.34. The final rule retains modifications from the proposed rule that clarify that it is the permitting authority’s responsibility, and not that of the small MS4 permittee, to establish permit terms and conditions that meet the MS4 regulatory standard and to delineate the requirements for implementing the six minimum control measures, other terms and conditions deemed necessary by the permitting authority to protect water quality, as well as any other requirement. The final rule also emphasizes that permit requirements must be expressed in “clear, specific, and measurable” terms. These modifications do not alter the existing, substantive requirements of the six minimum control measures in § 122.34(b). See further discussion of these changes in Section VI.

D. Commonalities Among the Two Types of General Permits

The two options available to the permitting authority under the final rule involve different steps and require differing levels of administrative oversight; however, at a basic level, they share the same underlying characteristics. Each type of general permit shares in common that through the permitting process, the permitting authority must determine which requirements a small MS4 must meet in order to satisfy the MS4 permit standard. Both types of general permits also require that the specific actions that comprise what is necessary to meet the MS4 permit standard be established through the permitting process. The key distinction between the two types of permits is that they establish permit terms and conditions at different points in time during the permitting process. For Comprehensive General Permits, the determination as to what requirements are needed to satisfy the MS4 permit standard is made as part of the issuance of the general permit. By contrast, for Two-Step General Permits, the permitting authority makes this determination both in the process of issuing the general permit and in the process of establishing additional permit requirements applicable on an individual basis to each MS4 covered under the general permit, based on information in the NOI.

The final rule also places both types of general permits on a level playing

field with respect to the requirements that must be addressed in any general permit issued to a small MS4. Regardless of which type of general permit is used to establish permit terms and conditions, every small MS4 general permit must include requirements that address the minimum control measures (§ 122.34(b)), water quality-based requirements where needed (§ 122.34(c)), and evaluation and assessment requirements (§ 122.34(d)). The final rule clarifies that all such terms and conditions must be expressed in terms that are “clear, specific, and measurable.” The important attribute here is that permit requirements must be enforceable, and must provide a set of performance expectations and schedules that are readily understood by the permittee, the public, and the permitting authority alike. For both types of general permits, requirements may be expressed in narrative or numeric form, as long as they are clear, specific, and measurable. This requirement for clear, specific, and measurable requirements applies to any permit term or condition established under § 122.34, including requirements addressing the minimum control measures, any water quality-based requirements, and the evaluation, recordkeeping, and reporting requirements. Section VII of this preamble contains a detailed discussion about establishing permit terms and conditions.

Importantly, the final rule also ensures that the process for issuing both types of general permit addresses the deficiencies found by the Ninth Circuit to exist in the Phase II regulations. While the court’s opinion focused on the role of the NOI in the Phase II rule for MS4 general permits, the court made it clear that under the CWA, the permitting authority must determine which MS4 permit requirements are adequate to meet the MS4 permit standard, and that the public must have the opportunity to review and comment on those permit requirements and to request a hearing. All of these core CWA requirements are present in the final rule. For Comprehensive General Permits, once the permit is issued it has gone through permitting authority review, public notice and comment, and the opportunity to request a hearing. Permitting authority review and public comment and opportunity for a hearing occurs in the process of drafting permit conditions and soliciting comment on the draft general permit. Permitting authority determination of what an MS4 must do to meet the MS4 permit standard occurs in the process of issuing

the final permit after consideration of comments. By comparison, for Two-Step General Permits, permitting authority review, public notice and comment, and the opportunity to request a hearing occur first on the draft general permit and again on the additional terms and conditions applicable to each MS4 authorized to discharge under the general permit. Under the Two-Step process, the CWA requirements for permitting authority review and public comment and opportunity for hearing are only fully addressed after the completion of each discharge authorization process for each individual small MS4 operator seeking coverage under the general permit. To ensure that these CWA requirements are met, the final rule supplements the administrative steps necessary to issue the base general permit with procedures that ensure that any decision to authorize an individual MS4 to discharge based on information included in the NOI is subject to review by the permitting authority, and the public has the opportunity to review and submit comments, and to request a hearing on the terms and conditions that will be incorporated as enforceable permit terms.

E. Role of the NOI Under the Permitting Authority Choice Approach

The two permitting options available under the final rule include important changes in the relationship between the MS4 operator's NOI and the general permit. Under the 1999 Phase II regulations, any MS4 operator seeking coverage under a small MS4 general permit has been required to submit information in the NOI describing, at a minimum, the BMPs that would be implemented for each minimum control measure during the permit term, and the measurable goals associated with each BMP. These NOIs differ significantly from the typical general permit NOI, which is required to include far less information, and "represents no more than a formal acceptance of [permit] terms elaborated elsewhere" in the general permit. See *EDC*, 344 F. 3d. at 852. Under the NPDES regulations at § 122.28(b)(2)(ii), the NOI is a procedural mechanism to document operator eligibility, to certify that the information submitted by the operator is accurate and truthful, and to confirm the operator's intention to be covered by the terms and conditions of the general permit.

The Ninth Circuit court, in its remand decision, likened the NOI under the remanded regulations to being "functionally equivalent to a detailed application for an individualized

permit," since the MS4 operator was in essence proposing to the permitting authority what it intended to accomplish to satisfy the MS4 permit standard. The court found it to differ markedly from the NOI utilized for most general permits, that is, limited to "an item of procedural correspondence." 344 F. 3d. at 853. The similarity in the court's view between the NOI under the Phase II regulations and an individual permit application, combined with the failure of the regulations to require permitting authority review or to provide the opportunity for the public to comment and request a hearing on the NOI, were key factors in the Ninth Circuit finding that the regulations had violated the CWA.

The final rule modifies the way in which the NOI functions in important respects so that it addresses the problems found by the Ninth Circuit. For a Comprehensive General Permit, because the permit contains all of the requirements that will be used to assess permittee compliance, the permitting authority no longer needs to rely on the MS4's NOI as the mechanism for ascertaining what will occur during the permit term. In this way, the function of the NOI is the same as that of any other general permit NOI, and more specifically other stormwater general permits, where the NOI is used to establish certain minimum facts about the discharger, including the operator's contact details, the discharge location(s), and confirmation that the operator is eligible for permit coverage and has agreed to comply with the terms of the permit. It is for this reason, therefore, that the final rule establishes no additional requirements for the information required to be included in NOIs beyond what is already required for other general permits in § 122.28(b)(2)(ii). See § 122.33(b)(1) in the final rule. By removing the possibility that permit requirements could be proposed in the NOI (or in the SWMP) and made part of the permit once permit coverage is provided under the Comprehensive General Permit approach, the NOI will no longer look and function like an individual permit application, as the court found with respect to MS4 NOIs under the original Phase II regulations. Similarly, because the NOI no longer bears the similarity of an individual permit application, it is no longer necessary to carry out the type of additional permitting authority review and public participation steps contemplated by the Ninth Circuit.

By contrast, for coverage under a Two-Step General Permit, the NOI needs to include information to assist the permitting authority in developing

the additional permit requirements for each permittee. For this NOI, the permitting authority requires more detailed information from the MS4 operator so that it can determine what additional permit terms and conditions are necessary in order to satisfy the MS4 permit standard. The NOI in the Two-Step General Permit is likely to include much of the same information that has been required of MS4 operators under the regulations since they were promulgated in 1999. The major difference now is that the permitting authority reviews the NOI materials to determine what additional permit terms and conditions are necessary for the individual MS4 to meet the MS4 permit standard, and to provide an opportunity for the public to comment and request a hearing on this determination.

The proposed rule would have required the full set of information required for individual permit applications in § 122.33(b)(2)(i), including the proposed BMPs to be implemented for the minimum control measures, measurable goals for each BMP (as required by § 122.34(d) of the original regulations), the persons responsible for implementing the stormwater management program, the square mileage served by the MS4, and any other information deemed necessary. In the final rule, EPA is taking a slightly different approach and giving the permitting authority the flexibility to determine what information it needs to request in its Two-Step General Permit NOI rather than requiring by default that all of the individual permit application information be submitted. This will give the permitting authority the ability to request what information it needs to establish the necessary additional terms and conditions for each individual MS4 to meet the MS4 permit standard. If the permitting authority needs information from all of its MS4s on the BMPs and measurable goals they propose for the permit term in order to establish suitable permit requirements, then it has the discretion to require this information. See §§ 122.28(d)(2)(i) and 122.33(b)(1)(ii), which states that the information requested by the permitting authority "may include, but is not limited to, the information required under § 122.33(b)(2)(i)."

Alternatively, under the final rule, if the general permit terms and conditions already define what is required to meet the MS4 permit standard for several of the minimum control measures then the permitting authority could decide that it is no longer necessary to require the submittal of information on the BMPs and measurable goals associated with

those minimum control measures. As noted by a commenter, requiring information from MS4s related to permit terms and conditions that have already been established is likely to be redundant and represent an unnecessary burden. At the same time, the permitting authority must be able to obtain sufficient information to establish clear, specific, and measurable permit terms and conditions. Under the final rule, there is no minimum requirement with respect to what information is needed. In short, the permitting authority must request the information it needs to be able to make an informed decision when establishing clear, specific, and measurable permit terms and conditions for the permittee to ensure that it will meet the MS4 permit standard. The final rule enables the permitting authority to determine what the right amount of information is needed to meet this requirement.

F. Permitting Authority Flexibility To Choose the Most Suitable Approach

The final rule provides permitting authorities with full discretion to choose which option is best suited for its permitting needs and specific circumstances. While there are significant considerations, advantages, and disadvantages to selecting either of the two permitting approaches, EPA is leaving the decision of which method to adopt for each general permit up to the permitting authority. In providing full discretion to the permitting authority to choose which approach to use, EPA agreed with commenters that recommended against adopting conditions or constraints on the selection of either of the two options. EPA also expects that the decision as to which approach to adopt for any given small MS4 general permit may change from one permit term to the next. Therefore, if the permitting authority elects to issue its next general permit by implementing the “Comprehensive General Permit Approach” there is nothing preventing the permitting authority from switching approaches to the “Two-Step General Permit Approach” in subsequent permit terms, or vice versa.

EPA requested comment on whether the agency should constrain the permitting authority’s discretion under Option 3 by requiring the use of the “Traditional General Permit Approach” (now the “Comprehensive General Permit”) for some types of permit terms and conditions, while allowing the “Procedural Approach (now the “Two-Step General Permit”) to be used for other requirements. Several commenters recommended that EPA require

permitting authorities to use the proposed “Traditional General Permit Approach” to establish permit requirements for the minimum control measures in § 122.34(b) and to allow the use of the proposed “Procedural Approach” for the establishment of water quality-based effluent limits, such as those implementing total maximum daily loads (TMDLs). EPA refers to this approach below as a “fixed hybrid approach.” Other commenters were opposed to a fixed hybrid approach and urged EPA to provide permitting authorities with maximum discretion to choose which option works best without stipulating which option must be used for specific types of permit requirements.

After consideration of these comments, EPA has determined that it is unnecessary to mandate which permitting approach is used for specific types of requirements. Primarily, EPA does not wish to prejudge what approach permitting authorities use to arrive at clear, specific, and measurable requirements that result in achieving the MS4 permit standard. As an overall matter, EPA views both of the approaches in the final rule as equally valid ways of establishing the required permit terms and conditions and meeting the remand requirements.

Having said this, however, EPA recognizes that some types of requirements are more easily established through the general permit than others. For instance, clear, specific, and measurable permit requirements that address the minimum control measures, due to their broad applicability to all MS4s, may be easier to develop and include within the general permit, than requirements addressing TMDLs. EPA’s *MS4 Permit Improvement Guide* (EPA, 2010) and the MS4 permit compendia¹ provide a number of ready examples for how permits may establish clear, specific, and measurable requirements that implement the six minimum control measures. On the other hand, the necessarily site- and watershed-specific nature of TMDLs, combined with the fact that effective implementation of TMDLs is enhanced through involvement of the public at the local level, makes these types of requirements more amenable to being developed through the procedural requirements of the second permitting step within the Two-Step General Permit. To illustrate this point, a number of states have already adopted approaches that enable

the MS4s to first develop and propose something like a TMDL implementation plan, followed by a step where the state permitting authority reviews and approves the plan to make it an enforceable part of the permit. See related examples in EPA’s *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016).² In this situation, under the final rule, the permitting authority would establish the MS4’s TMDL implementation requirements as part of the second step of the general permit and follow the procedures applicable to the Two-Step General Permit in § 122.28(d)(2).

EPA anticipates that some permitting authorities may over time appreciate the benefits of not having to go through a second process step for individual review and individualized public notices for each MS4, and may as an alternative choose to establish the required permit terms and conditions necessary to meet the MS4 permit standard in the general permit. Under the Two-Step General Permit, the permitting authority must provide public notice for each MS4’s NOI and the proposed additional permit terms and conditions to be applied to the MS4, and review and process comments and any requests for a public hearing before finalizing the permit terms and conditions. By comparison, there is only one public notice for an opportunity to comment and request a hearing for a Comprehensive General Permit. Even if deciding that a Comprehensive General Permit is not the best fit, some permitting authorities may find it easier over time to move more requirements into the base general permit so that the number of permitting provisions subject to the additional individualized review and public notice is reduced.

G. Why EPA Did Not Choose Proposed Option 1 or 2 as Stand-Alone Options

By adopting the proposed State Choice Approach (Option 3) (now called the “Permit Authority Choice Approach”) for the final rule, EPA is making a decision to not adopt Option 1 (the “Traditional General Permit Approach”) or Option 2 (the “Procedural Approach”) from the proposal as the sole approach by which permitting authorities issue and administer their small MS4 general permits. As stated in Section V.B., the public comments were heavily in favor of adopting Option 3, although there were also proponents for finalizing

¹ These documents can be found on EPA’s Web site at <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#resources>.

² This document will be made available on EPA’s Web site at <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#resources>.

proposed Option 1 and for finalizing an approach that would require use of proposed Option 1 for the minimum control measures and proposed Option 2 for water quality-based requirements. EPA ultimately found most persuasive the comments arguing in favor of choosing Option 3 to give permitting authorities flexibility and discretion to determine how it would develop different permit requirements.

A major theme among comments favoring Option 3 was the emphasis on the flexibility it would provide permitting authorities to choose which approach works best in their state. This flexibility will be important, according to a number of commenters, to continue to be able to administer a program that includes local governments with divergent geography, land resources and uses, and financial and resource capacities. According to a number of commenters, Option 3 would also give permitting authorities a range of options for crafting permit conditions for non-traditional MS4s (e.g., universities, hospitals, military bases, road and highway systems), which in many cases require different types of permit provisions than traditional MS4s due to their lack of regulatory, land use, and/or police powers and more limited audiences. Other comments focused on the significant burden that would be placed on states and regulated MS4s if required to adopt one uniform approach, especially in cases where the permitting authority is already implementing approaches that are similar to either proposed Option 1 or 2. In some cases, the way in which permitting authorities write and administer their small MS4 general permits is a direct result of state case law or concern about the risk of state litigation, and these states argue forcefully in their comments about the importance of retaining their approach in light of this history. According to these comments, those permitting authorities that have chosen one or the other of Option 1 or 2 should be able to continue implementing that approach.

Another related common theme among the comments was an argument against adopting either proposed Option 1 or Option 2 as a national, one size fits all approach. These comments emphasized the difficulties associated with forcing all permit terms and conditions into one general permit for all MS4 types and all water quality considerations using the proposed Option 1 approach, and underscored the resource demands associated with implementing an Option 2 approach. Many of these commenters concluded that Option 3 would be the best way of

preserving the permitting authority's flexibility to tailor their approach based on what would work best for each state's circumstances.

Based on these comments, EPA chose Option 3, the Permitting Authority Choice option, because both options are valid ways of addressing the court's remand and there is no reason to compel permitting authorities to adopt one or the other of the approaches in proposed Option 1 or Option 2. EPA also appreciates that those state permitting authorities that are already moving their small MS4 permitting approaches in the direction of either Option 1 or 2 are doing so for a number of legitimate reasons that relate to these states' individual circumstances. By enabling permitting authorities to choose which option works best, EPA is avoiding disrupting already established state preferences. This is not to say that permitting authorities will not have to make changes to conform their procedures to the requirements of the final rule.

EPA also received comments urging the Agency not to adopt Option 2 as the only permitting choice available to permitting authorities because of the resource burdens associated with the Option 2 approach, especially the requirement to individually review and approve terms and conditions for their small MS4s. EPA does not dispute the fact that Option 2, which has been finalized as the "Two-Step General Permit", is resource intensive; this approach requires significant administrative oversight by design. The process of conducting an individual review of each MS4 operator's NOI, developing a proposal for comment of unique terms and conditions based on the NOI, and processing any public comments or requests for public hearings will require additional resources of the permitting authority if it is not already implementing this type of approach. Any permitting authority choosing this approach will need to carefully consider whether it has the resource capacity to handle the large amount of administrative oversight and review responsibilities that the Two-Step General Permit requires. EPA expects that the resource requirements alone will provide sufficient enough reason for a number of permitting authorities to choose the Comprehensive General Permit, or to minimize the number of terms and conditions it develops for individual MS4 to lessen the administrative burden associated with the Two-Step General Permit.

EPA understands that a permitting authority's decision to adopt the Two-

Step General Permit will mean that members of the public interested in commenting on small MS4 permit conditions may end up needing to review not only the draft general permit but also the public notice that proposes the additional terms and conditions for each MS4 that seeks coverage under the general permit. Some commenters considered this a disadvantage because it would be burdensome for the public as well. EPA does not see this as sufficient reason for EPA to choose Option 1 as the only option and deprive permitting authorities of the flexibility to use a two-step procedure. The Two-Step General Permit closely resembles, after all, the approach suggested in the EDC remand decision, which emphasized the need for permitting authority review and public participation procedures prior to the establishment of enforceable permit requirements. EPA appreciates the level of interest and concern there is among the public for ensuring that MS4 discharges are being adequately controlled and are making improvements in water quality. EPA notes that any permitting authority that takes on the Two-Step permitting process will need to be prepared to review and respond to any comments that it receives in response to the individual public notices it publishes, and will need to provide a rationale for any final permit terms and conditions established through the process. While states currently using a two-step type of procedure report that they receive few, if any public comments about requirements for individual MS4s, this will not necessarily hold true for the future. With this in mind, EPA found it important to clarify in the final rule that permitting authorities may switch to a Comprehensive General Permit for the next permit term simply by explaining which option they will use to provide coverage under the general permit.

V. How the Two General Permit Options Work

A. Comprehensive General Permit Approach

Permitting authorities opting to issue Comprehensive General Permits must establish the full set of requirements that are deemed necessary to meet the MS4 permit standard in § 122.34. (See § 122.28(d)(1), which requires that "the Director includes all required permit terms and conditions in the general permit.") The permit must therefore include terms and conditions that define what is required to meet the MS4 permit standard for the minimum control measures (§ 122.34(b)),

additional permit terms and conditions based on an approved total maximum daily load (TMDL) or other appropriate requirements to protect water quality (§ 122.34(c)), and requirements to evaluate and report on compliance with the permit (§ 122.34(d)). As a result, the Comprehensive General Permit is no different than other general permits in that all applicable effluent limitations and other conditions are included within the permit itself, and the NOI is used primarily to determine whether a specific MS4 is eligible and to secure coverage for that MS4 under the permit subject to its limits and conditions.

While a number of comments expressed support for the proposed Option 1 approach (now called the “Comprehensive General Permit” in the final rule), there were also comments expressing concern about the difficulty of putting together a permit that would comprehensively establish terms and conditions that would be suitable for and achievable by all eligible MS4s, including both traditional and non-traditional MS4s. Others questioned the ability of permitting authorities to write a single permit that would establish uniform requirements that would contain appropriate requirements for MS4s that have been regulated since the beginning of the Phase II program as well as for MS4s brought into the Phase II program by the latest Census, not to mention a permit that would be able to establish watershed-specific requirements addressing TMDLs. EPA acknowledges the challenge that permitting authorities will face in developing and issuing a Comprehensive General Permit. Synthesizing the collective understanding of MS4 capabilities across an entire state, and translating this into effective and achievable permit requirements, will require a greater effort up front in developing one of these permits. However, as described in further detail below, there are ways of addressing challenges such as these, for example, by subcategorizing MS4s by experience, size, or other factors, and creating different requirements for each subcategory.

To assist permitting authorities in developing permit conditions for a Comprehensive General Permit, EPA has compiled examples of permit provisions from existing permits that implement the minimum control measures, which are written in a “clear, specific, and measurable” manner. These examples are included in a document entitled *Compendium of MS4 Permitting Approaches—Part 1: Six Minimum Control Measure Provisions* (EPA, 2016). EPA has also included in

a separate compendium examples of permit provisions to consider when addressing approved TMDLs.³ A number of commenters requested that EPA continue to provide these types of examples to help permitting authorities implement the final rule. EPA agrees with these comments, and plans to regularly update these compendia and provide other similar types of technical assistance.

There are a variety of permitting approaches that should be considered to address the concerns raised about developing a Comprehensive General Permit for the large number and variety of regulated MS4s, and which address the array of localized or watershed-based issues. One approach that may work is to issue two different comprehensive general permits or to subdivide the permitted universe, establish in the main body of the permit requirements that apply to all MS4s, and to provide a separate appendix that establishes MS4-specific terms and conditions, which apply uniquely to different categories of MS4s. For instance, the state of Washington has issued two MS4 general permits, one for the eastern part of the state and the other for the western part of the state. Further, the Western Washington Small MS4 General Permit includes a TMDL appendix, which establishes additional permit requirements for specific MS4s based on the watershed in which they are located and the waterbody to which they discharge. These additional requirements are each translated from the approved TMDL for that watershed and the specific waterbody. Another approach that permitting authorities can consider is to establish different requirements for each minimum control measure for separate sub-categories of MS4s based on type of MS4 or other factors.⁴ Permits could also include separate sections for traditional versus non-traditional MS4s,⁵ or alternatively separate permits may be issued for these different categories of MS4s, as several states are doing for departments of transportation MS4s. The main benefit of these different approaches is that they provide the permitting authority with a way of dividing up the universe of small

MS4s into smaller categories, which are composed of municipalities with a greater degree of similarity among them.

B. Two-Step General Permit Approach

Inherent in the Two-Step General Permit approach is the fact that the general permit requirements are not on their own adequate to meet the MS4 permit standard in § 122.34. In order to fill in the gaps, the permitting authority must individually review information submitted with each eligible MS4 operator’s NOI, and propose additional permit requirements to apply to the MS4 individually that, together with the base general permit requirements, meet the MS4 permit standard for that MS4. These proposed additional permit requirements and the information on which it is based is then subject to public notice and comment, and the opportunity to request a hearing.

The first step of the Two-Step General Permit is to develop and issue the final small MS4 general permit, or “base general permit.” The need for the second step arises because the base general permit does not include all of the terms and conditions necessary to meet the MS4 permit standard, and therefore has left the development of the additional requirements to a second process. NOIs for general permits using this approach must include more information than NOIs for typical general permits.

The proposed rule described the steps that would be involved in the second step of the permitting process in Section VI.B of the preamble (81 FR 427, January 6, 2016). EPA requested comment on modifying the applicable parts of the NPDES regulations to enable permitting authorities to incorporate additional, enforceable elements of the Two-Step General Permit for individual MS4s following a process that would require public notice, the opportunity to request a public hearing, and a final permitting determination. The model that EPA proposed for this procedure was based on several of the key components of the permitting framework adopted for Concentrated Animal Feeding Operations (CAFOs) in § 122.23(h). EPA proposed that the new “Option 2” process would be contained in § 122.33(b)(1), where the NOI requirements for small MS4 general permits are located. The proposal described the rule provisions as follows:

- At a minimum, the operator must include in the NOI the BMPs that it proposes to implement to comply with the permit, the measurable goals for each BMP, the person or persons responsible for implementing the SWMP, and any additional information

³ See EPA’s *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016).

⁴ For example, Colorado’s 2016 Small MS4 General Permit includes a different set of actions and corresponding deadlines for “new permittees” and “renewal permittees.” See Section H, <https://www.colorado.gov/pacific/sites/default/files/COR090000-PermitCertification.PDF>.

⁵ See California’s 2013 Small MS4 General Permit, http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/phsiii2012_5th/order_final.pdf.

required in the NOI by the general permit. The Director must review the NOI to ensure that it includes adequate information to determine if the proposed BMPs, timelines, and any other actions are adequate to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. When the Director finds that additional information is necessary to complete the NOI or clarify, modify, or supplement previously submitted material, the Director may request such additional information from the MS4 operator.

- If the Director makes a preliminary determination that the NOI contains the required information and that the proposed BMPs, schedules, and any other actions necessary to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act, the permitting authority must notify the public of its proposal to authorize the MS4 to discharge under the general permit and, consistent with § 124.10, make available for public review and comment and opportunity for public hearing the NOI, and the specific BMPs, milestones, and schedules from the NOI that the Director proposes to be incorporated into the permit as enforceable requirements. The process for submitting public comments and hearing requests, and the hearing process if a hearing is granted, must follow the procedures applicable to draft permits in §§ 124.11 through 124.13. The permitting authority must respond to significant comments received during the comment period, as provided in § 124.17, and, if necessary revise the proposed BMPs and/or timelines to be included as terms of the permit.

- When the Director authorizes coverage for the MS4 to discharge under the general permit, the specific elements identified in the NOI are incorporated as terms and conditions of the general permit for that MS4. The permitting authority must, consistent with § 124.15, notify the MS4 operator and inform the public that coverage has been authorized and of the elements from the NOI that are incorporated as terms and conditions of the general permit applicable to the MS4 (81 FR at 427–429, January 6, 2016).

The final rule matches closely with what was proposed as the steps necessary to implement Option 2. These steps, which are part of what was finalized as the “Two-Step General

Permit,” are described as follows in § 122.28(d)(2):

(1) The MS4 operator submits the NOI with the information about its activities as specified in the general permit.

(2) The permitting authority reviews the NOI to determine if the information is complete and to develop proposed additional permit requirements necessary to meet the MS4 permit standard;

(3) If the permitting authority makes a preliminary determination to authorize the small MS4 operator to discharge it must give the public notice of and opportunity to comment and request a public hearing on the proposed additional permit terms and conditions, and the basis for these additional requirements, including the NOI and other relevant information submitted by the MS4. These procedures must be carried out in accordance with 40 CFR part 124.

(4) Upon completion of the procedures in step (3), the permitting authority may authorize the discharge from the MS4 subject to the requirements of the base general permit and the final requirements established in the second step. Using this approach, the permitting authority may choose to rely fully on the completion of this process to establish most of required permit terms and conditions for a particular MS4, or it may rely on a hybrid approach wherein some of the necessary requirements are established within the base general permit at permit issuance while the remaining set of requirements are developed during the process of authorizing individual MS4 discharges in the second step.

Where EPA has modified the Two-Step General Permit from the proposed rule, it is to clarify a point made in the proposed rule. For instance, EPA makes a clarification in the final rule regarding the requirements for NOI review in the Two-Step approach. The proposed rule explained that the purpose of the permitting authority’s review is to determine whether the NOI is complete and whether the operator’s proposed set of BMPs and measurable goals are adequate to meet the MS4 permit standard. The final rule places emphasis on the fact that the information submitted by the MS4 operator with its NOI is for the purpose of informing the permitting authority’s determination as to what “additional terms and conditions necessary to meet the requirements of § 122.34.” See § 122.28(d)(2)(ii). What the operator submits in the NOI is determined by the permitting authority when establishing the base general permit. The permitting authority may request descriptions of

BMPs to be implemented and measurable goals as the MS4’s proposal for what it considers to be adequate to “reduce pollutants to the maximum extent practicable, protect water quality and satisfy the appropriate water quality requirements of the Clean Water Act.” Under the Two-Part General Permit in the final rule, the permitting authority reviews this information to craft what it determines are the necessary permit terms and conditions to meet this MS4 permit standard; these terms and conditions are then subject to the permitting procedures for public comment and the opportunity to request a hearing. The specific requirements developed out of this process may bear a substantial similarity to the operator’s proposed BMPs and measurable goals, but they also may be modified or further refined based on the permitting authority’s own determination as to the specific requirements that it deems necessary to meet the MS4 permit standard. For instance, instead of proposing to adopt all of the BMP details that are submitted by the MS4 operator with the NOI as enforceable permit requirements, the permitting authority may instead develop proposed requirements that focus in on the specific actions and milestones that it believes would represent significant progress during the permit term. This is a clarification from the proposed rule description of the NOI review process, which did not clearly articulate the permitting authority’s role in reviewing the operator’s BMP and measurable goal information, or other information requested in the base general permit (or fact sheet).

Another clarification made to the proposed Two-Step process relates to the 40 CFR part 124 procedures to follow during the second step. The final rule incorporates by reference several specific sections of part 124. These specific references are consistent with the proposed rule’s reference generally to part 124, however, in the final rule EPA focused in on the specific procedural requirements that ensure that the public participation aspects of the Two-Step General Permit are consistent with the NPDES regulations. These part 124 requirements are necessary because the permitting authority is proposing to add additional terms and conditions to the general permit applicable to individual MS4 permittees. EPA likens these additional terms and conditions to the development of a “draft permit” under § 124.6, and, as such, these draft requirements must undergo minimum permitting procedures for public notice,

comments, and hearings before they are established in final form. The following procedural requirements are referenced directly:

Public Notice of Permit Actions and Public Comment Period (§ 124.10, Excluding (c)(2))

—By incorporating these provisions of § 124.10 for the Two-Part General Permit, this means that the permitting authority's notice must adhere to the following minimum public notice requirements for the draft permit conditions:

- The notice must provide a minimum of 30 days for the public to provide comment on the draft permit terms and conditions. The permitting authority must provide notice to the public at least 30 days prior to holding a public hearing on these draft requirements. See § 124.10(b).

- The permitting authority must provide public notice to the MS4 operator who submitted the NOI, to any relevant agencies or other entities referenced in § 124.10(c)(1), and members of the public on the permitting authority's mailing list pursuant to § 124.10(c)(1)(ix). The public notice must also be sent in a manner constituting legal notice to the public under state law (if the permit program is administered by an approved state), and by using "any other method reasonably calculated to give actual notice" of the draft terms and conditions being added to the permit. See § 124.10(c)(3) and (4).

- *The public notice must consist of:* (1) The name and address of the office processing the NOI and draft terms and conditions for the MS4 operator; (2) name, address, and telephone number of a person from whom interested persons may obtain further information, including copies of the draft terms and conditions, statement of basis or fact sheet, and the NOI; (3) a brief description of the comment procedures required by §§ 124.11 and 124.12 and the time and place of any hearing that will be held, including a statement of procedures to request a hearing, and any other procedures by which the public may participate in the final authorization decision; (4) for EPA-issued permits, the location of the administrative record required by § 124.9, the times when the record will be open for public inspection, and a statement that all data submitted by the operator is available as part of the administrative record; (5) a general description of the location of each discharge point and the name of the receiving water; and (6) any additional

information considered "necessary or proper." The public notice of a hearing under § 124.12 must include: (1) Reference to the date of previous public notices relating to the same MS4; (2) date, time, and place of the hearing; and (3) a brief description of the nature and purpose of the hearing, including the applicable rules and procedures. See § 124.10(d).

- In addition to the public notice, the permitting authority must mail a copy of the fact sheet or statement of basis, the NOI, and the draft terms and conditions to the operator and other agencies and entities listed in § 124.10(c)(1)(ii) and (iii). See § 124.10(e).

A cross-reference to § 124.10(c)(2) is not included in the final rule. Although these requirements apply to general permits, EPA distinguishes in the Two-Step General Permit between the base general permit and the terms and conditions that are added through the second permitting step for individual MS4 permittees. The permitting authority is required to comply with § 124.10(c)(2) when issuing the general permit (*i.e.*, the base general permit). However, because the additional MS4-specific terms and conditions are developed in a manner that is similar to the way in which terms in an individual permit would be developed, EPA concluded that the public notice requirements that apply to individual permits are more appropriate for the second step in the process of authorizing an MS4 to discharge under a Two-Step General Permit. For this reason, EPA does not apply the specific requirements of § 124.10(c)(2) to the proposed additional terms and conditions, but does apply the other applicable public notice requirements of § 124.10.

Public Comments and Public Hearings (§§ 124.11 and 124.17)

Consistent with § 124.11, during the public comment period for the draft permit conditions, any member of the public may submit comments and may request a hearing, if none has already been scheduled. The permitting authority is required to consider comments received during the comment period in making the decision to authorize the discharge. When the permitting authority has made a final determination to authorize an individual small MS4 to discharge under the general permit, subject to the additional incorporated requirements, it must also make available to the public its responses to comments received, subject to the applicable requirements of § 124.17.

Public Hearings (§ 124.12)

If the permitting authority holds a public hearing on the draft permit conditions, public notice of the hearing must be provided as specified in § 124.10 and the hearing must be conducted in accordance with the requirements of § 124.12.

Obligation To Raise Issues During the Public Comment Period (§ 124.13)

During the public comment period for the draft permit conditions, commenters are obligated to raise "all reasonably ascertainable issues and submit all reasonably available arguments supporting their position" as required in § 124.13.

Upon completion of these procedures, in which permitting authority review, public notice and comment, and any public hearings take place in accordance with the appropriate sections of part 124, the permitting authority may authorize the MS4 to discharge under the terms of the permit. When authorization occurs, the final terms and conditions that were the subject of the public comment and hearing process described above become enforceable permit terms and conditions for that MS4 permittee. No significant changes were made to this step from the proposed rule. EPA clarifies that the permitting authority may choose the method by which the permittee is notified of the final decision to authorize the discharge and the final permit conditions, and by which the public is informed of the same. EPA oversight of state-issued NPDES permits must also be taken into account. Under the Two-Step General Permit, EPA has authority to review all terms and conditions of the permit, whether established in a base general permit or in the second step that establishes terms and conditions for individual MS4s. See § 123.44.

C. Permittee Publication of Public Notice

A question arose during the development of the proposed rule as to whether the MS4 could carry out public notice requirements for the Procedural Approach (now referred to as the "Two-Step General Permit"). Several states currently require MS4 permittees to provide public notice of individual MS4 NOIs (and their proposed SWMPs in many states), including information on how the public can submit comments to the state and to request a public hearing. EPA requested comment on whether permitting authorities that have relied on the MS4 to place public notices in the past should be able to use this

approach to satisfy their public notice requirements for individual NOIs under the Two-Part General Permit. EPA did not propose this approach to be adopted as part of the rulemaking effort, and is not including in the final rule any specific requirements related to this practice.

EPA received several comments in response to this question. State permitting authorities and one statewide MS4 association voiced their support for allowing permitting authorities to require MS4 permittees to publish public notices, and to establish procedures within the final rule to accommodate this practice. One state suggested that if a permitting authority is allowed to rely on the MS4 to publish the public notice of the NOI, such public notice must follow all of the minimum requirements related to the contents and methods of providing notice, and any public comments received should be acknowledged and considered by the state and documented in the final permit decision. Another commenter recommended that the permitting authority be the only entity authorized to conduct public notice and comment procedures given the differences of opinion that may arise during the process, but suggested that as an alternative EPA could allow states to establish their own process for these procedures as long as they are consistent with the regulations.

Other commenters were opposed to allowing permitting authorities to rely on the MS4 permittee to carry out applicable public participation requirements. These commenters emphasized the clear requirement in the regulations for the permitting authority to conduct these activities, pointing to the fact that the NOI should be treated no differently than any permit application. These comments noted that members of the public wishing to review and potentially submit comments and request a hearing on NOIs should have a centralized place to refer to for reviewing public notices of NOIs, and feared that allowing a decentralized approach where the MS4 handles the public notice would be unlikely to reach the intended audience. Another point made was that in keeping with the permitting authority's responsibility to review and determine the adequacy of each MS4's NOI, the public notice and comment proceedings that are associated with the NOIs should be managed by the same entity. These commenters also questioned whether delegating these responsibilities to the MS4 made sense given the fact that it is the state that is most familiar with how to meet its own administrative rules and

protocols, and that is best equipped from a technical and physical capacity standpoint to receive and process comments, many of which will be submitted electronically, and potentially hold hearings. Additionally, some commenters worried about the effect of placing more burden on the municipalities.

The final rule does not address the issue of whether the permitting authority may rely on its MS4 permittees to carry out public notice responsibilities on its behalf in the final rule, but instead incorporates by reference the existing set of requirements that apply to all draft permits in § 124.10. As to whether permitting authorities may rely on the permittee to publish the public notice, it is EPA's view that they may do so as long as the public notice meets all of the applicable requirements in § 124.10. The public notice responsibilities in the NPDES regulations apply to the permitting authority, therefore these are requirements that it must ensure are met. The state must conduct any public hearing, consider the comments received, respond to them, and make decisions as to what changes are necessary as a result of the comments.

VI. Requirements for Permit Terms and Conditions

EPA proposed several clarifying changes to the regulatory language in § 122.34 regarding the expression of permit limits for small MS4s. First, EPA proposed to clarify that the permitting authority is responsible for establishing permit requirements that meet the MS4 permit standard. Second, proposed changes would address issues of clarity in permit terms and the different ways in which permit requirements can be expressed. Third, the proposal would reinforce the expectation that the MS4 standard must be independently met for each 5-year permit term. Each of these categories of regulatory changes is discussed below. The final rule incorporates these proposed changes, with some modification to the proposed rule language in response to comments and for additional clarity.

A. Permitting Authority as the Ultimate Decision-Maker

To directly address the clear message from the Ninth Circuit remand that the regulations need to preclude the small MS4 from determining on its own what actions are sufficient to meet the MS4 standard "to reduce pollutants to the maximum extent practicable, protect water quality and satisfy the appropriate water quality requirements of the CWA," EPA proposed revisions

throughout § 122.34 to make it clear that the permitting authority is responsible for establishing permit requirements that meet the standard. For this reason, EPA proposed to shift the focus of the requirements in § 122.34 to the "NPDES permitting authority" rather than the regulated small MS4. Similarly, the proposed rule modified the guidance provisions to focus on permitting authorities as well as MS4s. In most cases, this meant substituting the term "NPDES permitting authority" for "you" or "your" (referring to the regulated small MS4) and referring to the regulated small MS4 as the "operator." A related change tied to the remand was the proposed deletion of the sentence "Implementation of best management practices consistent with the provisions of the storm water management program required pursuant to this section and the provisions of the permit required pursuant to § 122.33 constitutes compliance with the standard of reducing pollutants to the 'maximum extent practicable.'" The Ninth Circuit court specifically raised this sentence as a demonstration that "nothing in the Phase II regulations requires that NPDES permitting authorities review these Minimum Measures to ensure that the measures that any given operator of a small MS4 has decided to undertake will *in fact* reduce discharges to the maximum extent practicable." See *EDC*, 344 F.3d at 832, 854. The proposal to remove this sentence, combined with the other changes, would reinforce the fact that the permitting authority is the entity responsible for establishing the terms and conditions of the permit necessary to meet the MS4 permit standard. These changes also would shift the focus of § 122.34 to the development of permit requirements and away from the identification of what the MS4 should include in its SWMP.

EPA received a relatively small number of comments responding to these proposed changes. Some commenters expressed a preference to continue to have the MS4 in charge of defining the MS4 standard for itself or requested that the deleted sentence ("Implementation of best management practices consistent with the provisions of the stormwater management plan. . . .") be retained. Other commenters pointed out that the proposed changes should apply to all regulated small MS4 permits, regardless of the type of permit (e.g., Traditional General Permit, Procedural General Permit, or individual), and requested that EPA clarify this in the final rule.

The final rule retains the proposed rule changes that emphasize that it is

the permitting authority with the ultimate authority to determine what small MS4s must do to meet the MS4 permit standard. These changes respond to the Ninth Circuit's finding in the *EDC* decision that the Phase II rule did not, contrary to the CWA, require the permitting authority to determine whether the MS4 permittee's proposed program would in fact meet the MS4 permit standard. Indeed, while the *EDC* decision specifically addressed the general permit process, the underlying rationale for the court's rejection of the general permitting process—the failure of the rule to ensure that the permitting authority, not the permittee, determine what is needed to meet the standard applicable to MS4 permits under the CWA—applies whether the MS4 permit is a general permit or an individual permit. Therefore, EPA is amending § 122.34 to apply to any permit issued to regulated small MS4s (except those small MS4s applying for an individual permit under § 122.33(b)(2)(ii)).

These changes, including the deletion of the sentence “Implementation of best management practices consistent with the provisions of the storm water management program required pursuant to this section and the provisions of the permit required pursuant to § 122.33 constitutes compliance with the standard of reducing pollutants to the maximum extent practicable,” more clearly establish the permit as the enforceable document, not the stormwater management program or what has been described in the SWMP. (See VI.E of this preamble for a discussion of the function of the “SWMP” under EPA's small MS4 regulation.)

B. “Clear, Specific, and Measurable” Permit Requirements

EPA also proposed rule revisions related to the expression of permit terms. Consistent with current EPA guidance, the proposed rule specified that permit requirements be expressed in “clear, specific, and measurable” terms. The preamble to the proposed rule contained a detailed discussion about what “clear, specific, and measurable” meant and EPA put in the rulemaking docket a draft compendium of example language from actual permits to further illustrate the meaning of “clear specific, and measurable.” See updated permit compendium in the final rule docket, *MS4 Compendium of Permitting Approaches: Part 1: Six Minimum Control Measures* (EPA, 2016). EPA also included in the preamble to the proposed rule, examples of permit language that *do not*

appear to have the type of detail that would be needed.

In addition to specifying that permit terms and conditions must be “clear, specific, and measurable,” the proposed rule text clarified that effluent limitations may be in the form of BMPs, and provided non-exclusive examples of how these BMP requirements may appear in the permit, such as in the form of specific tasks, BMP design requirements, performance requirements or benchmarks, schedules for implementation and maintenance, and the frequency of actions. This language was proposed to substitute for existing language that states: “Narrative effluent limitations requiring implementation of best management practices (BMPs) are generally the most appropriate form of effluent limitations when designed to satisfy technology requirements . . . and to protect water quality.”

EPA also proposed to delete a related guidance paragraph in § 123.34(e)(2). As explained in the proposed rule preamble, the guidance no longer reflects current practice.⁶ The deletion of this paragraph is also consistent with EPA guidance developed since 1999 regarding the types of requirements that are recommended for MS4 permits.⁷

EPA received numerous comments on these proposed changes. For the most part, commenters from all stakeholder groups expressed approval for the “clear, specific, and measurable” language. However, a variety of commenters read the deletion of “narrative” to mean that numeric effluent limitations (*e.g.*, end-of-pipe pollutant concentration limitations) would be required in small MS4 permits or that “narrative” limits would no longer be acceptable. As stated in the preamble, EPA did not intend to make substantive changes to § 122.34 beyond what would be required to address the court remand. The term “narrative” was proposed to be deleted to recognize that other expressions of effluent limitations may be appropriate, not to preclude the use of narrative effluent limitations. To avoid misinterpretation of the regulation, however, the final rule instead describes appropriate requirements as being “narrative, numeric, or other requirements.” EPA intends for the final rule text to more

broadly encompass the various types of controls for stormwater discharges that could be required of small MS4s.

Regarding the insertion of “clear, specific, and measurable” to describe permit requirements, most commenters perceived benefits for permittees, permitting authorities, and the public, particularly because it will be more clearly stated in the permit what is expected for compliance. Some commenters observed that “clear, specific, and measurable” terms would enable better enforcement of the MS4 permit requirements, and would provide a more effective path to improved water quality. Some small MS4s themselves pointed out that greater certainty in permit terms could put them into a better position to plan and to garner local political support and critical funding for their programs. Other MS4s, however, voiced uncertainty as to how the terms “clear, specific, and measurable” would be implemented and what would actually be required of them by their permits and concern that their flexibility would be unduly restricted. Some commenters also suggested that regulatory provisions associated with the expression of permit limits, while discussed in the preamble to the proposed rule in the context of Option 1, should apply regardless of the option chosen. Several groups requested that “clear, specific, and measurable” be changed instead to “focused, flexible, and effective.” Other commenters requested that “enforceable” be added to this phrase. Some groups representing MS4 permittees and industry expressed concern that “measurable” meant that permits would now contain water quality monitoring requirements or that “measurable,” together with the deletion of “narrative” to describe effluent limitations, meant that EPA was opening the door for small MS4 permits to now be required to contain numeric effluent limitations, *e.g.*, end-of-pipe pollutant concentration limits for each outfall in the system. A concern that “clear, specific, and measurable” would preclude or reduce MS4 flexibility to change program elements as a program encountered successes or failures (*i.e.*, adaptations made during the permit term or to meet MS4-specific circumstances) was also stated as a disadvantage associated with this language. In a related vein, several commenters warned against permit terms that were too specific and left very little discretion to the MS4. Some commenters requested that the regulatory text indicate that the expectation that permit requirements be “clear, specific, and measurable” apply

⁶ See EPA's *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016).

⁷ See EPA memorandum entitled *Revisions to the November 22, 2002 Memorandum “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,”* November 26, 2014.

to each BMP and other requirements in the permit, and accompanied by reporting requirements that related to measurable requirements, rather than measureable goals as in the current regulation.

The final rule retains the proposed rule requirement for “clear, specific, and measurable” permit terms and conditions. Accompanying the promulgation of this requirement, EPA is also publishing an updated version of its compendium of permit examples from the proposed rule (*i.e.*, *MS4 Compendium of Permitting Approaches: Part 1: Six Minimum Control Measures* (EPA, 2016)), which includes provisions from EPA and state MS4 general permits that provide examples of clear, specific, and measurable requirements. EPA also retains the examples provided in the proposed rule preamble of permit language that would generally not qualify as clear, specific, and measurable, which is included here, with minor edits:

- Permit provisions that simply copy the language of the Phase II regulations verbatim without providing further detail on the level of effort required or that do not include the minimum actions that must be carried out during the permit term. For instance, where a permit includes the language in § 122.34(b)(4)(ii)(B) (*i.e.*, requiring “. . . construction site operators to implement appropriate erosion and sediment control best management practices”) and does not provide further details on the minimum set of accepted practices, the requirement would not provide clear, specific, and measurable requirements within the intended meaning of the proposed Traditional General Permit Approach. The same would also be true if the permit just copies the language from the other minimum control measure provisions in § 122.34(b) without further detailing the particular actions and schedules that must be achieved during the permit term.

- Permit requirements that include “caveat” language, such as “if feasible,” “if practicable,” “to the maximum extent practicable,” and “as necessary” or “as appropriate” unless defined. Without defining parameters for such terms (for example, “infeasible” means “not technologically possible or not economically practicable and achievable in light of best industry practices”), this type of language creates uncertainty as to what specific actions the permittee is expected to take, and is therefore difficult to comply with and assess compliance.

- Permit provisions that preface the requirement with non-mandatory

words, such as “should” or “the permittee is encouraged to” This type of permit language makes it difficult to assess compliance since it is ultimately left to the judgment of the permittee as to whether it will comply. EPA notes that the Phase II regulations include “guidance” in places (*e.g.*, § 122.34(b)(1)(ii), (b)(2)(ii), and (b)(3)(iv)) that suggest practices for adoption by MS4s and within permits, but does not mandate that they be adopted. This guidance language is intended for permitting authorities to consider in establishing their permit requirements. Permitting authorities may find it helpful to their permittees to include guidance language within their permits in order to provide suggestions to their permittees, and it may be included. However, guidance language phrased as suggested guidelines would not qualify as an enforceable permit requirement under the final rule.

- Permit requirements that lack a measurable component. For instance, permit language implementing the construction minimum control measure that requires inspections “at a frequency determined by the permittee” based on a number of factors. This type of provision includes no minimum frequency that can be used to measure adequacy and, therefore, would not constitute a measurable requirement for the purposes of the rule.

- Provisions that require the development of a plan to implement one of the minimum control measures, but does not include details on the minimum contents or requirements for the plan, or the required outcomes, deadlines, and corresponding milestones. For example, permit language requiring the MS4 to develop a plan to implement the public education minimum control measure, which informs the public about steps they can take to reduce stormwater pollution. The requirement leaves all of the decisions on what specific actions will be taken during the permit term to comply with this provision to the MS4 permittee, thus enabling almost any type of activity, no matter how minor or insubstantial, to be considered in compliance with the permit.

Regarding the suggestion to add “enforceable,” in EPA’s view, clear, specific and measurable terms and conditions together define what makes a permit requirement enforceable. Therefore, adding “enforceable” to this list of attributes would not add to the enforceability of permit terms and conditions. With respect to the suggestion to replace “clear, specific, and measurable” with “focused,

flexible, and effective,” EPA clarifies that nothing in the final rule prevents a permitting authority from developing permit requirements that are focused, flexible, and effective, as long as those requirements are articulated in clear, specific, and measurable terms.

The word “specific” also generated a number of comments. EPA proposed “specific” to indicate what activities an MS4 would be required to undertake to implement the various required elements of the minimum control measures described in § 122.34(b) or to achieve a specified level of performance that would constitute compliance with the permit. Some commenters advocated for more specificity in permits, while others cautioned against too much specificity. Still others simply asked for more guidance about how “specific” a general permit would need to be. EPA intends for “specific” to mean that a permitting authority describes in enough in detail that an MS4 can determine from permit terms and conditions what activity they need to undertake, when or how often they must undertake it, and whether they must undertake it in a particular way. It must be clear what does and does not constitute compliance. As noted in the preamble to the proposed regulation, a verbatim repetition of the minimum control measures described in § 122.34(b) does not provide a sufficient level of specificity.

At the same time, EPA intends for the permitting authority to retain discretion in determining how much specificity is needed for different permit requirements. The level of specificity may change over time, for example, to reflect a more robust understanding of more effective stormwater management controls or to meet specific state needs. There is a wide range of ways to implement a stormwater management program and the permitting authority will need to determine how to craft permit terms and conditions that establish clear expectations that implement the various requirements in § 122.34 in specific terms, and this can be done while also providing flexibility to MS4s to choose how they will comply with permit terms. For example, a requirement to “Develop a public education program about the effect of stormwater on water quality” is not a sufficiently specific permit requirement. To provide greater specificity, some permitting authorities have provided a menu of specific public education activities in the permit, and the MS4 must choose from among them indicating how they will comply with the permit. For a hypothetical example, the permit might require that the MS4

undertake four public education activities each year from a list of activities specified in the permit and include at least one each year that is directed at students in all public schools within the MS4 area, using an existing or new curriculum, to explain ways in which stormwater can harm water quality. In this hypothetical example, the MS4 has the flexibility to choose from a list of activities the permitting authority has determined are acceptable and, for the required activity involving public schools, and to choose a curriculum that already exists or develop a new one that is tailored to specific stormwater problems in the community. The specific (clear and measurable) permit terms are:

(1) To undertake four education activities per year from a specified list of allowable activities; and (2) to ensure that at least one of the activities involves education about stormwater at all public schools. Compliance would be completion of four activities each year. One type of activity is specified in the permit, but the MS4 can choose the audience, the medium, and the specific message for the other three required activities. Even within the more specific requirement related to public schools, the permittee would have discretion in determining the form and content of the curriculum. In this hypothetical example, the permit contained requirements of varying specificity, but the boundaries of what constitutes compliance is readily apparent and it is clear what the MS4 must do and the timeframe for compliance.

What is not specified in a permit implicitly defines the level of discretion the MS4 has to meet the terms and conditions of the permit. EPA recognizes that it can be useful for MS4s to retain the ability to change specific stormwater control activities during the term of the permit without the need to seek a permit modification for every change. In the above hypothetical example, if the MS4 finds that, after the second year of the permit term that the curriculum it chose was not effective, it could develop a different one or choose another curriculum, *e.g.*, one that involves field work rather than just classroom instruction. The change in curriculum would not require a permit modification because the permit did not specify the particular curriculum that must be used. The permit terms in this case also provide the public with sufficient information to offer comments on the activities available, their number and frequency, and the degree of discretion left to the MS4. EPA emphasizes that it is not necessary that every detail be spelled out in a permit

as an enforceable requirement under the CWA. See further discussion of the considerations related to permit modifications in Section VI.E.

In the above hypothetical example, the permitting authority could have chosen more specific terms. For example, it could have required that the MS4s undertake activities A and B in the first year, activities C and D in the second year, and so on. It could have specified the medium to be used, *e.g.*, television or social media and each of the audiences that must be addressed in the outreach plan (*e.g.*, businesses, commercial establishments, developers). EPA notes that increased specificity does not necessarily mean that the permit is more stringent. It does, however, decrease the flexibility left to the MS4 to determine how to meet the permit requirement. Conversely, the permitting authority in the above hypothetical example could have been less specific, for instance, by not requiring one activity each year to be carried out in public schools. Permitting authorities need to consider what level of specificity is appropriate based on the particular factors at play in their permit area. The level of specificity may change over time, and should be evaluated in each successive permit. There may be differences of opinion about the degree of specificity needed, but that call would be open for public comment on the general permit or, if the Two-Part General Permit is used, on the public notice for the additional terms and conditions applicable to individual MS4s.

Another example of how the permit can provide greater specificity is to include distinct requirements based on type of MS4. For example, Section 3.2.1.3 of the Arkansas general permit states: "The stormwater public education and outreach program shall include more than one mechanism and target at least five different stormwater themes or messages over the permit term. At a minimum, at least one theme or message shall be targeted to the land development community. *For non-traditional MS4s, the land development community refers to landscaping and construction contractors working within its boundaries* (emphasis added). The stormwater public education and outreach program shall reach at least 50 percent of the population over the permit term." Here, the permitting authority further specifies the target audience as applied to non-traditional MS4s.

Alternatively, specific permit terms could be established uniformly for all eligible small MS4s, which would have the benefit of leveling the playing field

among small MS4s. The final rule gives permitting authorities some discretion to decide how much specificity to include in the permit and how much flexibility to leave to the MS4 when working out the details of how it will comply with permit terms. The public would have an opportunity to provide comments on such preliminary decisions about the level of specificity in permit terms and conditions needed during the public comment period on the general permit or on the second step of a Two-Step General Permit, or in some cases on both.

EPA also received comments on the term "measurable." In response to comments, EPA clarifies that "measurable" does not necessarily mean that water quality monitoring must be required in every instance to assess compliance. Likewise, it does not mean that numeric, end-of-pipe pollutant concentrations or loadings must be included in permits. While these examples do represent a type of measurable requirement, they are not required to be in every MS4 permit. Rather, the term "measurable" means that the permit requirement has been articulated in such a way that compliance with it can be assessed in a straightforward manner. For example, a permit provision that requires inspections at construction sites to be conducted once per week until final stabilization has been verified is a measurable requirement. To help assess compliance, the permit should also contain a way to track whether the requirement has been met, such as requiring the permittee to keep a log of each inspection, including the date and any relevant findings. On the other hand, a requirement that construction sites be inspected "after storms as needed" would not be a measurable requirement. For this requirement, the permittee would have to determine whether a "storm" occurred and, if so, whether an inspection was called for, both of which are determinations that are left completely up to the permittee to determine. A permitting authority could not easily assess that this requirement was or was not met.

Like the term "measurable," "numeric" is another term that is often misunderstood to require numeric end-of-pipe concentration and/or mass pollutant limitations similar to those that commonly appear in permits issued to other types of point source dischargers (*e.g.*, industrial process discharges and discharges from sewage treatment plants). EPA intends numeric to be read more broadly to include an objective, quantifiable value related to the performance of different

requirements for small MS4 programs. For example, “numeric” can refer to the number or frequency of required actions to be taken such as a requirement to “clean 25% of the catch basins in your service area on a yearly basis” or “complete 6 of 10 public education events specified in the following table on an annual basis.” “Numeric” can also refer to a specified numeric performance levels, such as a retention standard for post-construction discharges from new development and re-development sites, *e.g.*, “The first inch of any precipitation must be retained on-site.” Another example of a numeric performance requirement is exemplified by the following provision from the 2016 Vermont Small MS4 general permit: “The control measure(s) is designed to treat at a minimum the 80th percentile storm event. The control measure(s) shall be designed to treat stormwater runoff in a manner expected to reduce the event mean concentration of total suspended solids (TSS) to a median value of 30 mg/L or less.” See Section E.4.a.iv.B.

A commenter requested that EPA require measurable conditions for each BMP. EPA interprets this comment as recommending that permit terms implementing the minimum control measures, which are often articulated as narrative requirements, each be expressed in a measurable manner. EPA agrees that permit terms and conditions that are established to satisfy a minimum control measure need to have measurable (as well as clear and specific) requirements associated with them that assist the MS4 and permitting authority in determining whether required elements of the minimum control measures or other permit terms and conditions have been achieved.

In the final rule, EPA has decided to substitute the term “terms and conditions” for “effluent limitations” because stakeholders asserted the term effluent limitations connotes end-of-pipe numeric limits even though EPA is not insisting that these types of limitations be used. In sum, EPA intends that terms and conditions are a type of effluent limitations and that they are interchangeable and both mean permit requirements. As defined in the Clean Water Act, “effluent limitation” means “any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance.” See CWA section 502(11). The Clean Water Act also authorizes

inclusion of permit conditions. See CWA section 402(a)(1) and (2). Both “effluent limitations or other limitations” under section 301 of the Act and “any permit or condition thereof” are an enforceable “effluent standard or limitation” under the citizen suit provision, section 505(f) of the Clean Water Act, and the general enforcement provisions, section 309 of the Act. EPA uses these terms interchangeably when referring to actions designed to reduce pollutant discharges. For the purposes of this final rule, changing the small MS4 regulations to refer instead to “terms and conditions” is intended to be read as consistent with the meaning of “effluent limitations” in the regulations and CWA.

C. Narrative, Numeric, and Other Forms of Permit Requirements

As explained in the previous section of this preamble, EPA has clarified that permit limits need not be expressed only as “narrative” limits but can consist of “narrative, numeric, and other types” of permit requirements. The final rule provides a non-exclusive list of the types of narrative, numeric, and other types of terms and conditions that would be appropriate for small MS4 permits by stating that allowable terms and conditions could include, among other things “implementation of specific tasks or best management practices (BMPs), BMP design requirements, performance requirements, adaptive management requirements, schedules for implementation and maintenance, and frequency of actions.” These examples are the same as those proposed, with the exception of removing the term “benchmarks” and adding in its place, “adaptive management requirements.” Several commenters noted that the term “benchmarks” is used in EPA’s and many states’ Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity, or “MSGP,” to mean numeric pollutant concentration levels that must be measured, and if exceeded, trigger further monitoring or corrective action requirements. To eliminate any confusion, the commenters requested that a different term be used. EPA did not intend “benchmarks” to be precisely defined, but instead to generally refer to various types of identified measurements of performance and to undertake different actions or controls if performance is not at the measured level. To avoid confusion, EPA is replacing “benchmarks” with the phrase “adaptive management requirements,” since adaptive management approaches

are used widely in the MS4 communities. Adaptive management enables MS4 permittees to iteratively improve their stormwater control strategies and practices as they implement their programs and learn from experience to better control pollutant discharges.

With respect to establishing permit terms and conditions, use of the term “BMP” in § 122.34(a) is intended to take on a broad meaning and could encompass both the enforceable terms and conditions of the permit as well as particular activities and practices selected by the permittee that will be undertaken to meet the permit requirements but that are not themselves enforceable. BMPs are defined in § 122.2. The term is defined to include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce water pollution. The regulatory definition also includes treatment requirements, operating procedures, and practices to control runoff, spillage or leaks, sludge, or waste disposal, or drainage from raw material storages as BMPs. The defined regulatory term was developed to describe requirements to undertake certain activities to reduce the amount of pollutants discharged that are not described as numeric pollutant effluent discharge limitations or represent specific performance levels. See § 122.44(k). EPA intends, in § 122.34(a) of the final rule, to use BMP in its broadest sense to refer to any type of structural or non-structural practice or activity undertaken by the MS4 in the course of implementing its SWMP. Whether a BMP is an enforceable requirement depends on whether the permitting authority has established it as a term and condition of the permit. The term BMP in § 122.34(a) is not intended to be used interchangeably with enforceable requirements necessary to demonstrate compliance with the permit. Instead, it refers to any type of activity that is used to reduce pollutants in the MS4’s discharge. This distinction is important because, as discussed elsewhere in the preamble, some BMPs may be changed without first requiring a permit modification, but only if they are not included as enforceable requirements of the permit.

D. Considerations in Developing Requirements for Successive Permits

A final change to § 122.34(a) that EPA proposed was to reflect the iterative nature of the MS4 permit standard and require that what is considered adequate to meet the MS4 permit standard, including what constitutes “maximum

extent practicable,” needs to be determined for each new permit term. The final rule provision is retained from the proposed rule, which requires that for each successive permit, the permitting authority must include terms and conditions that meet the requirements of § 122.34 based on its evaluation of the current permit requirements, record of permittee compliance and program implementation progress, current water quality conditions, and other relevant information. The preamble to the proposed rule explained: “A foundational principle of MS4 permits is that from permit term to permit term iterative progress will be made towards meeting water quality objectives, and that adjustments in the form of modified permit requirements will be made where necessary to reflect current water quality conditions, BMP effectiveness, and other current relevant information.” (81 FR 422, Jan. 6, 2015). The preamble further listed possible sources to inform the evaluation such as past annual reports, current SWMP documents, audit reports, receiving water monitoring results, existing permit requirements, and applicable TMDLs.

EPA received numerous comments on the language regarding the development of each successive permit. One commenter asked EPA to include additional factors in the rule text that would need to be considered when developing a new small MS4 permit, including impairment status of the waterbody and applicable TMDLs, and permits developed by other states. Other factors requested to be included in the text were discussed in the preamble to the proposed rule include: how long the MS4 has been permitted, the degree of progress made by the small MS4 permittees as a whole and by individual MS4s, the reasons for any lack of progress, and the capability of these MS4s to achieve more focused requirements. Another commenter stated that while it is appropriate to re-examine the permit requirements for continued applicability and effectiveness, EPA should not presume that successive permits would always require more stringent requirements. Instead, the commenter continues, the permit could only require adjustments of existing BMPs. EPA also received general comments about the nature of “maximum extent practicable” that were reflected in comments concerning the new language about successive permits.

EPA has retained substantially the same text as it proposed. In § 122.34(a)(2), permitting authorities are required to revisit permit terms and

conditions during the permit issuance process, and to make any necessary changes in order to ensure that the subsequent permit continues to meet the MS4 permit standard. Thus, in advance of issuing any new small MS4 general permit, the permitting authority will need to review, among other things, available information on the relative progress made by permittees to meet any applicable milestones under the expiring permit, compliance problems that may have arisen, the effectiveness of the required activities and selected BMPs under the existing permit, and any improvements or degradation in water quality. This requirement applies regardless of the type of permit (individual or general) or the specific general permitting approach that is chosen by the permitting authority.

As commenters pointed out, there are other factors that the permitting authority can consider in establishing the permit requirements in successive permits that meet the MS4 permit standard. This provision, however, is intended to state a general requirement to update each permit and therefore uses broader, more general terms rather than trying to name all of the factors and considerations that may bear on the development of specific permit terms and conditions in successive permits. The crux of this requirement is that permitting authorities cannot simply reissue the same permit term after term without considering whether more progress can or should be made to meet water quality objectives or that other changes to the permit are in order. As is the case with NPDES permits generally, the permitting authority considers anew what is appropriate each time it issues a permit. For example, new stormwater management techniques may have arisen or become affordable during the expiring permit term that should be taken into consideration. The factors identified by commenters and discussed in the proposed rule preamble are all relevant considerations. First and foremost, as noted by one commenter, “the understanding of which pollution control measures and standards are the most effective and practicable can evolve, requiring corresponding changes in permit conditions to meet the ‘MEP’ standard.” Likewise, the stressors affecting water quality can change over time. The water quality of the receiving water and any applicable TMDLs are factors that should be considered, but additional rule language is unnecessary since these factors are already encompassed within the final rule’s reference to “current water quality

conditions.” (Also see, § 122.34(c) which requires permit conditions based on applicable TMDLs.) How long an MS4 has been permitted also could point to establishing different or “tiered” requirements based on whether the MS4 is on its third or fourth permit with a mature program or is a newly regulated MS4 that must build its program “from scratch.” Using broad, general terms to describe considerations that may change over time provides critical flexibility, while ensuring that the assessment of current circumstances and information is done.

Contrary to the assumption that EPA presumes that each successive permit will contain more stringent conditions for each permit requirement, EPA recognizes that this is not the case. It is possible that some permit conditions remain relatively static in a successive permit. If a permit, however, contained a less stringent requirement or less specific language than had been included in the previous permit this would require an explanation, backed by empirical evidence or other objective rationale that the requirement was no longer practicable or that another approach is more effective, and that making this requirement less stringent would not result in greater levels of pollutant discharges. This would be especially true where the MS4 is discharging pollutants to an impaired water due to an excess of those pollutants. How quickly pollutants must be reduced and which elements of a program need greater or less emphasis are certainly considerations that an MS4 (or others) can raise during the comment period. Likewise, an MS4 that is seeking an individual permit or coverage under a Two-Step General Permit, can propose BMPs or other management measures to the permitting authority that reflect its judgment about how and to what extent permit terms and conditions should change or stay the same.

One commenter asserted that EPA should require consideration of other states’ permits in determining permit conditions. The commenter reasoned that if one state adopts a requirement that achieves greater pollutant reduction than another state, the other state should have to adopt the more effective permit condition or explain why it is not practicable for MS4s in its state. The commenter also noted that EPA has taken similar positions with respect to technology-based requirements for other types of discharges. Finally, the commenter urged EPA to continue to provide and update examples of permit conditions developed by various states. EPA does not find it necessary to expressly require the rule to compel

permitting authorities to consider the terms and conditions of permits in other jurisdictions in determining the need to modify their own permits. Each permitting authority is required to issue permits that independently meet the MS4 permit standard based on an evaluation of, among other things, how well the past permit conditions worked and what more can be reasonably achieved in the next permit term. This evaluation involves factors that are necessarily unique to the permitting jurisdiction. Furthermore, the factors that led to one state permit's adoption of stricter requirements than another state makes a straightforward analysis between the two difficult, and potentially misleading. While EPA does not agree that permitting authorities should be required to consider other state permits, EPA agrees that much can be learned from other states' permitting approaches and it may be a relevant factor to consider in a particular permitting proceeding.

Commenters suggest that EPA's publication of its MS4 permit compendia (EPA, 2016), as well as EPA's *MS4 Permit Improvement Guide* (EPA, 2010), providing examples of permit provisions that are written in a "clear, specific, and measurable" manner, makes it easier for permitting authorities to write better permits. EPA agrees with commenters that sharing examples among states is an effective tool for developing permit conditions and has updated the compendium of state practices to accompany the final rule for this very reason. See *Compendium of MS4 Permitting Approaches—Part 1: Six Minimum Control Measures* (EPA, 2016) in the final rule docket.⁸ EPA plans to facilitate information transfer on a continuing basis.

E. Relationship Between the SWMP and Required Permit Terms and Conditions

a. Enforceability of SWMP Documents

In the proposed rule, EPA clarified that the SWMP document does not include enforceable effluent limitations or any other term or condition of the permit. EPA also proposed to delete the language in the Phase II regulations stating that implementation of the SWMP would constitute compliance with the MS4 permit standard. This clarification is retained in the final rule.

⁸ This document, and two additional compendia, *Compendium of MS4 Permitting Approaches—Part 2: Post Construction Standards* (EPA, 2016) and *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016), will be available at EPA's Web site at <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#resources>.

EPA is revising § 122.34(a) to clarify that the permit, not the stormwater management program, contains the requirements, including requirements for each of the six minimum measures, for reducing pollutants to the maximum extent practicable, protecting water quality and satisfying the appropriate water quality requirements of the CWA. See also Section VIII.A for further discussion of the deleted provision in § 122.34(a). The final rule at § 122.34(b) requires each permit to require the permittee to develop a "written storm water management program document or documents that, at a minimum, describes in detail how the permittee intends to comply with the permit's requirements for each minimum control measure." Requiring that portions of the SWMP be in the form of written documentation is not a new requirement, but rather a clarification. The minimum control measure requirements have always required that certain aspects of the permittee's SWMP be documented in writing, e.g., the storm sewer system map, ordinances or other regulatory mechanisms to regulate illicit non-stormwater discharges into the MS4 and to require erosion and sediment controls. The written SWMP provides the permitting authority something concrete to review to understand how the MS4 will comply with permit requirements and implement its stormwater management program. EPA included a specific requirement for written documentation to clarify, as requested by some commenters, the difference between a MS4's stormwater management program itself from the written description of the program.

EPA received several comments regarding the role of the SWMP document under the different permitting options. Among these comments were several focusing on whether the implementation details described in the SWMP document itself, including the BMPs to be implemented and measurable goals to be achieved, would be enforceable as permit requirements. One commenter noted that some states consider a SWMP document to be an integral part of the permit and recommended that EPA do nothing in the rule to limit a permitting authority's ability to enforce against an MS4 for failure to implement any particular aspect of the SWMP and to require an accurate, up-to-date SWMP document that contains the provisions required by the permit. Other commenters, representing the regulated MS4 point of view, emphasized the role of the SWMP document as a planning tool for the

permittee, one that is intended to be continually updated to reflect their adaptive management approach to permit compliance. These commenters cautioned against implying directly or indirectly that the SWMP document is an "effluent limitation" that is part of the permit, and felt that under Option 1 of the proposed rule, provisions in SWMP documents could be interpreted by the public to be effluent limitations, thereby opening all details described in the SWMP document to enforcement. These commenters recommended that EPA more narrowly define "effluent limitation" and clarify that SWMPs are for planning purposes only and not subject to challenge by outside parties.

In response to these comments, EPA clarifies that, under EPA's small MS4 regulations, the details included in the permittee's SWMP document are not directly enforceable as effluent limitations of the permit. The SWMP document is intended to be a tool that describes the means by which the MS4 establishes its stormwater controls and engages in the adaptive management process during the term of the permit. While the requirement to develop a SWMP document is an enforceable condition of the permit (see § 122.34(b) of the final rule), the contents of the SWMP document and the SWMP document itself are not enforceable as effluent limitations of the permit, unless the document or the specific details within the SWMP are specifically incorporated by the permitting authority into the permit. In accordance with the final rule, therefore, if an MS4 permittee fails to develop a SWMP document that meets the requirements of its permit, this failure constitutes a permit violation. By contrast, the details of any part of the permittee's program that are described in the SWMP, unless specifically incorporated into the permit, are not enforceable under the permit, and because they are not terms of the permit, the MS4 may revise those parts of the SWMP if necessary to meet any permit requirements or to make improvements to stormwater controls during the permit term. As discussed in more detail below, the permitting authority has discretion to determine what elements, if any, of the SWMP are to be made enforceable, but in order to do so it must follow the procedural requirements for the second step under § 122.28(d)(2).

The regulations envision that the MS4 permittee will develop a written SWMP document that provides a road map for how the permittee will comply with the permit. The SWMP document(s) can be changed based on adaptations made during the course of the permit, which

enable the permittee to react to circumstances and experiences on the ground and to make adjustments to its program to better comply with the permit. The fact that the SWMP is an external tool and not required to be part of the permit is intended to enable the MS4 permittee to be able to modify and retool its approach during the course of the permit term in order to continually improve how it complies with the permit and to do this without requiring the permitting authority to review and approve each change as a permit modification. The fact that the regulations do not require the implementation details of the SWMP document to be made enforceable under the permit does not mean that a permitting authority cannot decide to directly incorporate portions of the SWMP or the entire SWMP as enforceable terms and conditions of the permit. However, in order to adopt any part of the SWMP document as an enforceable term or condition it must go through the proper permitting steps to do so. If a permitting authority chooses to directly incorporate elements of the SWMP document as enforceable permit requirements, once completing the minimum permitting steps to propose and finalize NPDES permit conditions, those elements of the SWMP are no longer external to the permit, but instead become enforceable terms and conditions of the permit.

Lastly, EPA understands that some state permitting authorities already incorporate elements of their permittees' SWMP document using a process that is similar to the Two-Step General Permit process in the final rule. EPA emphasizes that under the final rule if a permitting authority chooses to adopt portions of their permittees' SWMPs using the Two-Step General Permit process this would be a valid way to formally incorporate these as permit terms and conditions; this is because in order to make these requirements enforceable under the permit the permitting authority provided the necessary review and public notice and comment procedures. By contrast, EPA generally would not consider general permits that state that the SWMP documents developed by the MS4 are enforceable under the permit, without first formally adopting the details of these documents to the individual permitting authority review and public participation required by the second step of the Two-Step General Permit, to be an adequate way in which to incorporate the details of the SWMP as enforceable requirements of the permit.

b. Permit Modification Considerations

EPA raised the issue in the proposed rule of whether under the Procedural Approach (now in the final rule as the "Two-Step General Permit" approach) a permit modification would be necessary during the permit term if BMPs or measurable goals were changed by the permittee from that which was submitted to the permitting authority. EPA specifically sought comment on what criteria should apply for distinguishing between when a change to BMPs is "substantial" requiring a full public participation process or "not substantial" that would be subject to public notice but not public comment under a permit modification process similar to the process in § 122.42(e)(6).

A number of commenters expressed support for treating some types of changes as non-substantial modifications to the permit. Commenters emphasized the fact that the types of plans, strategies, and practices implemented under MS4 SWMP are subject to considerable change, and that requiring these changes to undergo a review for a permit modification would stifle the process as well as innovation. Some commenters offered suggestions for what types of changes to the SWMP should constitute a substantial modification and should be reviewable by the permitting authority, and which types of changes should be considered non-substantial. Some thought that a complete change to a BMP should be reviewed by the permitting authority for a modification, while others felt that such changes should not be submitted for review if the replacement BMP would be considered to provide equal or better pollutant removal. Another commenter suggested that EPA incorporate applicable requirements from the CAFO regulations whereby the permittee submits proposed changes to the permitting authority and the permitting authority must determine whether such changes comply with applicable, substantive legal requirements, and if the changes are substantial, then the permitting authority must require public notice, and an opportunity to provide comments or request a hearing before the determination is made on the modification.

The Two-Step approach requires the MS4 operator to provide information about what it intends to do during the permit term to satisfy some or even all of the permit requirements for meeting the MS4 permit standard. The rule then requires the permitting authority, through a review and public comment process, to establish MS4-specific

permit terms and conditions that the permitting authority deems necessary to meet the MS4 permit standard. Once issued, these additional permit requirements are set for the permit term, and compliance is measured based on the permittee's ability to meet these enforceable terms and conditions. When the final permit terms and conditions are established, changes to those requirements can only be made through a formal modification process, which is subject to the requirements of § 122.62, or § 122.63 if the proposed change constitutes a minor modification.

A distinction between what constitutes a potential change in permit terms and what amounts to merely a change in implementation of the SWMP is important to consider in the context of the Two-Step General Permit. Where a permittee proposes to change a BMP that it is implementing, and the change does not require the enforceable permit conditions to be changed in any way, but rather offers an alternative means of complying with the same permit conditions, EPA would not consider this to be a permit modification. For instance, if the MS4's permit requires that it conduct field tests of 20 percent of its priority outfalls on an annual basis for illicit discharges, and the permittee changes its method of conducting such tests that is described in its SWMP document, even though a revision to the SWMP document maintained by the permittee may be necessary, no permit modification would be necessary because the 20 percent requirement is still in effect. By contrast, where a permittee proposes to substitute one of its BMPs for another one, and that change would alter the compliance expectations defined in the permit, the permittee will need to notify the permitting authority before proceeding to determine if a permit modification is necessary. For example, if the permittee's requirements specify in precise detail the field screening methodology that the MS4 will utilize for its priority outfalls, and the permittee has indicated it no longer intends to use this approach, then this proposed change will need to be evaluated by the permitting authority for whether a formal permit modification is needed. The important test here is to compare the permittee's proposed change with the terms and conditions of the permit.

EPA shares the views of commenters who emphasized the problems that would be created by any permitting scheme that would require permit modifications to be formally reviewed and approved for every SWMP change. Changes and adjustments made to the

SWMP document during its implementation are a fundamental part of the Phase II program, which has always emphasized the need for adaptive management to make iterative progress towards water quality goals. Requiring every adaptive management change to undergo review and approval by the permitting authority would constrain implementation and innovation, as commenters suggested, and could greatly increase the burden on permitting authorities. Having said this, however, EPA recognizes that in some circumstances, as illustrated in the example above, the wording of a permit provision may require that a modification be made before a permittee may proceed with a proposed change to its SWMP document. If the permitting authority wants to minimize the instances when a permit modification would be needed, it could incorporate with specificity only those elements in the SWMP document that it deems essential for meeting the MS4 permit standard. For example, a permitting authority could decide that as an alternative to incorporating all of the details of the permittee's proposed outfall screening plan in its "illicit discharge detection and elimination" portion of its SWMP document into the permit, it might instead consider selecting the specific aspects of the screening plan that in its judgment would meet the MS4 permit standard, such as that the permittee will screen all "high priority" outfalls by a specific date and that all illicit discharges will be eliminated within a specified amount of time. By not incorporating every aspect of the specific plans and procedures described by the permittee in its SWMP document, the permittee can modify its implementation approach during the permit term without needing to check with the permitting authority before making any such changes and having that change approved under the permit.

Apart from the issue of whether or not proposed SWMP document changes require a permit modification is the need for permitting authorities to specify what procedures it will follow to review and process any permit modifications. EPA agrees with the commenter that suggested that such procedures are needed. Rather than establishing a unique set of procedures, however, it is EPA's view that the existing regulatory procedures in §§ 122.62 and 122.63, which apply to all NPDES permit modifications, are sufficient for modifications to a Two-Step General Permit. EPA advises permitting authorities to include in their

permits a clear description of what types of proposed SWMP document changes will need to be reviewed as potential permit modifications, and the procedures for submitting and reviewing these changes.

F. Explaining How the Permit Terms and Conditions Meet the MS4 Permit Standard

Several commenters recommended that the final rule clarify, both in the preamble and in the rule language itself, that permitting authorities are required to include an explanation in the permit's administrative record as to why the adopted permit provisions meet the MS4 permit standard. The commenters specified that this requirement should apply regardless of the option EPA chooses to include in the final rule.

EPA agrees that the permitting authority's rationale for adopting specific small MS4 permit requirements should be documented consistent with the requirements for any NPDES permit requirements under § 124.8 and, if EPA is the permitting authority, § 124.9. This rationale should describe the basis for the draft permit terms and conditions, including support for why the permitting authority has determined that the requirements meet the required MS4 permit standard. EPA agrees with the commenters' suggestion that this rationale should be provided under both permitting approaches in the final rule. This position is consistent with the Ninth Circuit's remand decision, which emphasized the need for permitting authorities to determine that requirements satisfy the MS4 permit standard and that the public be given an opportunity to provide comments and to request a hearing on this determination.

For clarification purposes, EPA includes additional language in the final rule for the Two-Step General Permit approach to emphasize that the permitting authority's public notice for the second step (pursuant to § 122.28(d)(2)(ii)) must include, apart from the NOI and the proposed additional permit terms and conditions, "the basis for these additional requirements." This requirement is consistent with the requirements of § 124.8(b) for what must be included in a permit fact sheet. EPA does not find it necessary for the permitting authority to produce a full fact sheet for each individual MS4 permittee under a Two-Step General Permit, nor do the regulations require this for the type of permit requirements that are being established under the second step. A fact sheet is required for the issuance of the general permit, regardless of whether the general permit is a

Comprehensive General Permit or the base general permit in a Two-Step General Permit. See § 124.8(a), which requires fact sheets to be prepared for general permits. However, the NPDES regulations do not require a separate fact sheet to be developed for the additional terms and conditions that are established for individual MS4s in the second step of the Two-Step General Permit, since these requirements are not themselves part of the base general permit, nor do they necessarily fall under any of the other types of permits listed in § 124.8(a) as requiring a fact sheet (e.g., a "major" NPDES facility or site). Short of requiring a separate fact sheet for the draft additional permit conditions, EPA finds it reasonable to expect the proposed additional permit terms and conditions to be accompanied by the supporting rationale for why these requirements satisfy the MS4 permit standard.

One commenter also suggested that permitting authorities be required to explain in the administrative record why any alternative standards recommended in public comments or included in any of EPA's MS4 permit compendia were not adopted. Permitting authorities are required to respond to significant comments received in response to the public notice for the Comprehensive General Permit and the base general permit of a Two-Step General Permit, and, in addition, to respond to the comments on the second step public notice under a Two-Step General Permit. Such comments could include alternative standards suggested for inclusion in the permit. EPA does not agree that permitting authorities should be required to explain in the administrative record why a provision included in any of the agency's MS4 permit compendia was not used in any particular permit. Again, the example permit provisions that are highlighted in the permit compendia are provided as guidance and are not intended to provide a floor for what types of provisions must be used in MS4 permits.

G. Minimum Federal Permit Requirements

Several commenters requested clarification or raised concerns about the extent to which the Phase II regulations establish minimum permit requirements. This question is often raised in the context of state laws that prohibit the permitting authority from including terms and conditions in a permit that are more stringent than the federal minimum requirements or include more than the federal minimum requirements. Some comments confuse

“minimum permit requirements” with the specified elements of the minimum control measures described in § 122.34(b). In a related manner, a number of permitting authorities have shared with EPA their experiences in encountering resistance to a proposed permit requirement on the basis that it is not explicitly required in the federal regulations. In addition, some commenters asked EPA to clarify that suggestions made in the “guidance” paragraphs that are unique to the small MS4 regulations are not mandatory permit terms.

The regulations specify the elements that must be addressed in a permit. It is up to the permitting authority to establish the specific terms and conditions to meet the MS4 permit standard for each of these elements. The minimum control measures set forth in § 122.34(b), for instance, are not intended as minimum permit requirements, but rather areas of municipal stormwater management that must be addressed in permits through terms and conditions that are determined adequate to meet the MS4 permit standard. For that matter, if a permitting authority were to merely use the minimum control measure language from § 122.34(b) word-for-word and include no further enforceable permit terms and conditions, this permit would not satisfactorily meet the requirement to establish clear, specific, and measurable requirements that together ensure permittees will comply with the MS4 permit standard. EPA emphasizes that what constitutes compliance with the MS4 permit standard continues to evolve. The need to reevaluate what is meant by “maximum extent practicable” for each permit term, as well as the need to determine what is necessary to protect water quality and satisfy the appropriate water quality requirements of the CWA, means that what constitutes compliance will by necessity change over time. Therefore, in EPA’s view, those that argue that the minimum federal requirements are what is included in the wording of the minimum control measures, are misconstruing the intent of the regulations, and are handicapping permits by artificially tying the MS4 permit standard to the minimum control measures.

EPA emphasizes that the minimum control measures do not restrict the permitting authority from regulating additional sources of stormwater pollutant discharges, not specifically mentioned in the minimum control measure language. For example, some states require small MS4s with very large populations to implement a

program that addresses industrial sites due to the concentration of industrial sites in many of their larger urban areas. (Consider that some small MS4s can be the same size as “medium” MS4s, which are required to have a program for addressing stormwater discharges from industrial sites.) Such a requirement represents what is necessary, for those small MS4s, to reduce pollutants as necessary to meet the MS4 permit standard. This does not mean that the requirement is more stringent than the minimum control measures, but rather it constitutes what is needed in the permitting authority’s view to satisfy the MS4 permit standard.

In response to the comments relating to the guidance language in § 122.34(b), EPA verifies that this “guidance” is intended to act as suggested methods of implementation, not mandatory permit terms. Having said this, EPA points out that these guidelines could form the basis of permit terms that meet the § 122.34(a) requirement to articulate requirements in a clear, specific, and measurable manner. EPA’s interest in having more specific requirements in permits is to provide clarity of expectations and to hold MS4s accountable for implementing a program that continues to make progress toward achievement of water quality objectives. For a permitting authority to include requirements in a permit based on these “guidance requirements,” because in its view they are necessary to ensure MS4s meet the MS4 permit standard, does not mean that the permit has established requirements beyond the federal minimum or that the permitting authority impermissibly used guidance to develop enforceable requirements.

H. Comments Beyond the Scope of This Rulemaking

EPA received numerous public comments suggesting revisions to the substantive requirements in § 122.34. EPA clearly stated its intent in the preamble to the proposed rule that it was not proposing to change any substantive requirement and therefore the many comments suggesting the addition of specific requirements (e.g., establish or do not establish a numeric retention standard for post-construction stormwater controls) are outside the scope of this rulemaking.

VII. Revisions to Other Parts of § 122.34

A. Compliance Timeline for New MS4 Permittees

EPA proposed a minor revision to § 122.34(a) to include the word “new” before “permittees” to indicate that the five-year period allowed to develop and

implement their stormwater management program applies to the initial permit for new permittees. New permittees could include small MS4s that are in urbanized areas for the first time because of demographic changes reflected in the latest decennial census, or they could be specifically designated by a permitting authority as needing an NPDES permit to protect water quality. This change is intended to preserve the flexibility included in Phase II regulations in place prior to this final rule, and to more clearly indicate that the extended time period for compliance is intended to apply to MS4s that must put a stormwater management program in place for the first time. This revision does not change the status quo; it merely recognizes that first-time small MS4 permittees have up to five years to develop and implement their SWMPs, while small MS4s that have already been permitted will have developed and implemented their SWMPs when they reapply for permit coverage under an individual permit or submit an NOI under the next small MS4 general permit. This is not to say that all actions necessary to achieve pollutant reductions must be completed in the first five years. EPA recognizes that MS4s may need more time, for example, to complete the various steps needed to get structural controls into place and operational (e.g., design project(s), secure funding, follow procurement procedures, etc. before installing structural BMPs). Therefore, EPA is retaining in the final rule the proposed clarification that permitting authorities may provide up to 5 years for small MS4s being permitted for the first time to come into compliance with the terms and conditions of the permit and to implement necessary BMPs.

B. Revisions to Evaluation and Assessment Provisions

EPA proposed to renumber existing § 122.34(g) as § 122.34(d) and to incorporate the stylistic changes described in Section VII.E of this preamble. Several commenters suggested that the terminology in this paragraph be changed to conform to the text changes made elsewhere. EPA agrees that changes to reflect the remand changes similar to the ones made elsewhere in the section are appropriate for the newly designated § 122.34(d)(1) concerning requirements for evaluation and assessment. The new § 122.34(d)(1) now states that the permit must require the permittee to evaluate compliance with the terms and conditions of the permit, the effectiveness of the components of its stormwater management program, and of achieving

the measurable requirements in the permit. Rather than evaluate the appropriateness of self-identified BMPs and measurable goals as previously required, the final rule requires permits to include terms and conditions to evaluate compliance with permit requirements, including achievement of measurable requirements established as permit requirements. This language more closely aligns the required evaluation and assessment requirements with the newly articulated requirements for developing permit conditions that are clear, specific, and measurable. It also more accurately describes the objectives of the evaluation and assessment requirements, given other revisions made in response to the remand to clarify that permitting authorities determine what is constitutes compliance, not the regulated MS4s.

The proposed rule inadvertently omitted a recent amendment to § 122.34(g) (§ 122.34(d) in the final rule) that was added by the eReporting rule (80 FR 64064, Oct. 22, 2015). This omission is corrected in the rule text that appears in this **Federal Register** document. The relevant provision in § 122.34(d)(3) states that, among other things, starting on December 21, 2020 all reports submitted in compliance with this section must be submitted electronically by the owner, operator, or the duly authorized representative of the small MS4 to the permitting authority or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127, and that prior to this date, and independent of part 127, the owner, operator, or the duly authorized representative of the small MS4 may be required to report electronically if specified by a particular permit or if required to do so by state law. Section IX addresses in more detail the relationship between this final rule and the eReporting rule.

EPA received a request to revise proposed § 122.34(d)(2) regarding recordkeeping requirements to mandate that MS4s post on-line the SWMP documents required under § 122.34(b). Currently, MS4s are only required to make summaries of their SWMP available to the public upon request. EPA is of the view that on-line posting of information is an effective way to communicate stormwater program information, and encourages MS4s to post on-line documents that describe their stormwater management plans, as well as provide other information about managing stormwater for various audiences. EPA, however, declines to

adopt a regulatory requirement for MS4s to post documents on-line. EPA did not propose any changes to the recordkeeping requirements, and accordingly, the request is outside the scope of the proposal. EPA notes that some permitting authorities have required on-line posting of SWMP information and educational materials to implement minimum controls measures for public education and involvement, as well as elements of other minimum control measures such as the illicit discharge detection and elimination, construction and post-construction program minimum controls, and other permit requirements.

C. Establishing Water Quality-Based Requirements

EPA made minor changes to the provisions for establishing “other applicable requirements.” See § 122.34(c). The following discussion explains these changes and describes how the section has been rearranged. It then discusses issues raised about how water quality-based requirements can be established under the two general permit options.

EPA proposed to consolidate existing paragraphs (e)(1) and (f) into one paragraph and to move this consolidated provision to § 122.34(c). EPA also proposed to delete guidance paragraph (e)(2). Existing § 122.34(e)(1) addresses the need to comply with permit requirements that are in addition to the minimum control measures based on a TMDL or equivalent analysis. Existing § 122.34(f) requires compliance with permit requirements that have been developed consistent with provisions in §§ 122.41 through 122.49, as appropriate. EPA is promulgating the proposed revisions, with minor editorial changes, as discussed below.

The new § 122.34(c)(1) states that the permit will include, as appropriate, more stringent terms and conditions, including permit requirements that modify, or are in addition to, the minimum control measures, based on an approved total maximum daily load (TMDL) or equivalent analysis, or where the NPDES permitting authority determines such terms and conditions are needed to protect water quality. EPA replaced the term “effluent limitations” with “terms and conditions” to be consistent with changes made to § 122.34(a). In a minor change from the proposal, the paragraph now more clearly indicates that the permitting authority has the discretion to require additional measures to protect water quality, not limited to requirements based on a TMDL or equivalent analysis. This change reflects the authority

granted by the statute to protect water quality in section 402(p)(6) of the CWA. It also responds to a comment that due to the time it takes for TMDL development, permitting authorities should not be limited to consideration of only TMDL or equivalent analyses before imposing water quality based requirements. As a general matter, EPA agrees that other types of watershed plans that identify sources that should be controlled can provide a valid basis for establishing additional permit terms and conditions. Additionally, EPA recognizes that there may be instances where other information about the water quality impacts of the MS4 discharges may be sufficient to indicate the need for additional controls. (Of course, permitting authorities must have a rational basis and record support for determining that additional requirements serve a water quality objective.)

The final rule deletes existing § 122.34(e)(2), as was proposed. As explained in the preamble to the proposed rule, the guidance in existing § 122.34(e)(2) reflects EPA’s recommendation for the initial round of permit issuance, which has already occurred for all permitting authorities. The phrasing of the guidance language no longer represents EPA policy with respect to including additional requirements. EPA has found that an increasing number of permitting authorities are already including specific requirements in their small MS4 permits that address not only wasteload allocations in TMDLs, but also other requirements that are in addition to permit provisions implementing the six minimum control measures irrespective of the status of EPA’s § 122.37 evaluation. See EPA’s *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016).⁹ Based on the advancements made by specific permitting programs, and information that points to stormwater discharges continuing to cause waterbody impairments around the country, prior to the promulgation of this final rule, EPA has advised in guidance that permitting authorities write MS4 permits with provisions that are “clear, specific, measurable, and enforceable,” incorporating such requirements as clear performance standards, and including measurable goals or quantifiable targets for

⁹ This document will be made available at on EPA’s Web site at <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#resources>.

implementation.¹⁰ This guidance is a more accurate reflection of the agency's current views on how the Phase II regulations should be implemented than the guidance currently in § 122.34(e)(2).

EPA received few comments about the proposed removal of § 122.34(e)(2). Several commenters strongly supported the deletion of § 122.34(e)(2), while others expressed concern that MS4s may not be in a position to implement additional controls. The MS4 permit standard embodies a great deal of flexibility and gives the permitting authority discretion to address particular water quality impairments. Where a waterbody is impaired in part due to discharges from small MS4s, especially where an approved TMDL allocates wasteload reduction responsibilities to those MS4s, additional controls to achieve reasonable progress towards attainment of water quality standards will need to be considered. The permitting authority has the ability under the final rule to develop requirements tailored to a particular MS4, either by issuing an individual permit or by employing the Two-Step General Permit process in § 122.28(d)(2). Some permitting authorities have successfully created requirements for specific MS4s in a more comprehensive general permit. For example, the 2013 California Small MS4 general permit establishes additional requirements for small MS4s discharging to waters with an approved TMDL. Each set of "deliverables" or "actions required" is tailored to the individual MS4, or groupings of MS4s, based on the pollutant of concern and the particular wasteload allocation. See Appendix G of the 2013 California Small MS4 general permit.

D. Establishing Water Quality-Based Requirements Under the Two General Permit Options

EPA received a number of questions and suggestions concerning how requirements to implement applicable TMDLs should be incorporated into general permits under any of the proposed options. Some comments asserted that there is incompatibility between the proposed Option 1 approach and the need to establish permit terms and conditions that address TMDLs, which require watershed- and MS4-specific provisions. One commenter questioned whether a general permit can incorporate different water quality-based effluent limitations for different MS4s asserting that the NPDES

regulations require that general permits include the same water quality-based effluent limits for sources within the same category. Several commenters also suggested that requirements addressing TMDLs are ones that are amenable to using the Option 2 approach given their inherently watershed-specific nature and the fact that TMDL implementation plans often need to be developed with the involvement of the community so that issues such as implementation schedules and BMP approaches reflect the interests of the affected public and are attainable.

EPA clarifies that in order to comply fully with the Comprehensive General Permit approach, all terms and conditions established based on approved TMDLs must be included within the permit itself. Use of the Comprehensive General Permit approach means that the permit needs to spell out the requirements necessary for permittees "to achieve reasonable further progress toward attainment of water quality standards." (64 FR 68753, December 8, 1999) Therefore, where a TMDL establishes wasteload allocations specifically or categorically for MS4 discharges to the impaired water, the permittee should expect to find "clear, specific, and measurable" requirements within the permit that delineate their responsibilities during the permit term relative to that TMDL and associated wasteload allocation(s). There are a variety of approaches for incorporating these TMDL-related requirements into general permits for specific MS4s. One noteworthy approach places all applicable water quality-based effluent limitations in an appendix to the general permit (e.g., Appendix 2 of the 2012 Western Washington Small MS4 General Permit). For this particular permit, the state evaluated all relevant TMDLs addressing discharges from small MS4s eligible for coverage under the permit and assigned additional requirements focused on reducing the discharge of the impairment pollutant. See EPA's *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016), which will be posted on EPA's Web site at <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#resources>, for additional examples.

EPA does not view any of these approaches as inconsistent with the NPDES regulatory requirement that "where sources within a specific category or subcategory of dischargers are subject to water quality-based limits . . . the sources in that specific category or subcategory shall be subject to the same water quality-based effluent

limitations." See § 122.28(a)(3). It is certainly true that, due to the watershed-specific nature of TMDLs, requirements in general permit based on TMDLs can vary for individual MS4s based on the impaired water to which they discharge and the specific details of the applicable TMDL. EPA, however, does not view these differing water quality-based limit requirements within the same general permit as running afoul of the § 122.28(a)(3) requirement. EPA considers the different water quality-based requirements that are unique to a TMDL and/or to MS4s that are subject to the TMDL to be the equivalent of dividing the MS4 permittee universe into subcategories based on these requirements. This categorization is not dissimilar to the way in which EPA and many states issue their Multi-Sector General Permits for Stormwater Discharges Associated with Industrial Activity, in which there are requirements common to all facilities and a separate set of requirements that apply to different industrial sectors or subsectors. By establishing different permittee subcategories based on TMDLs, the permit remains consistent with the requirement in § 122.28(a)(3).

Use of a Two-Step General Permit similarly requires that where requirements are necessary under § 122.34(c) to address TMDLs that they be expressed in a clear, specific, and measurable manner. These requirements can be included in the base general permit or they can be developed through the second permitting step of the Two-Step General Permit approach where additional terms and conditions are established for individual MS4s. EPA agrees with the commenters that, given the watershed-specific nature of TMDLs and the strategies needed to address them, in many cases it may be that a Two-Step General Permit is the approach that provides the greatest amount of flexibility to account for these differences. The advantage of this approach is that it allows each MS4 to develop and propose stormwater control strategies that are supported by the community and that can then be reviewed by the permitting authority for adequacy. EPA notes that there are several states that have already set up permit approaches that require MS4s to first develop TMDL implementation plans that are then reviewed and approved by the permitting authority. These approaches may provide useful models to draw from especially for those permitting authorities that choose to establish water quality-based requirements through a Two-Step

¹⁰ See EPA's *MS4 Permit Improvement Guide* (EPA, 2010).

General Permit. See examples in EPA's compendium document, *Compendium of MS4 Permitting Approaches—Part 3: Water Quality-Based Requirements* (EPA, 2016), which will be posted on EPA's Web site at <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources#resources>.

E. Restructuring, Consolidating, Conforming, and Other Editorial Revisions

EPA proposed a restructuring of certain provisions in § 122.34(c) through (e) and making a number of minor editorial revisions to reflect the changes made elsewhere to meet remand requirements and to change the style of regulatory text, as discussed earlier in this preamble. EPA proposed to update the cross-references in § 122.35 to conform to the rearrangement of provisions in § 122.34. The preamble at Section VIII.B addresses changes to address water quality-based permit provisions currently in § 122.34(e) and to consolidate existing paragraphs (e) and (f) into new paragraph (c). This section explains other revisions. For the most part, EPA is promulgating these proposed revisions and has added similar revisions to additional provisions that were identified in comments. The following discussion briefly explains those changes.

First, the current § 122.34(c) of the regulations concerning “qualifying local programs” has been moved to § 122.34(e) as proposed. The only changes to the text of the existing language are to remove the words “you” and replace it with “the permittee.” EPA received no comments on this proposed revision.

Second, the current § 122.34(d) that addresses information requirements for obtaining NPDES permit coverage under a general or individual permit has been moved to § 122.33(b)(2). All basic information requirements necessary to obtain permit coverage under the two types of individual permits and two types of general permits are now consolidated in § 122.33. EPA clarifies that these information requirements apply to individual permits, while the information required to be included in NOIs for general permits is to be determined by the permitting authority based on what it needs in order to establish the permit terms and conditions necessary to meet the MS4 permit standard. See further discussion in Sections IV.C and E.

Third, EPA also proposed to delete paragraphs (d)(2) and (3) in § 122.34 that required the permitting authority to provide a menu of BMPs for each minimum control measure, and, where

such a menu of BMPs had not been provided, stated that a small MS4 need not be held to any “measurable goal” for that BMP. The final rule deletes these paragraphs as no longer necessary. EPA provided a menu of BMPs that has been available on its Web site for a number of years. EPA expects that this menu and any similar state menus will continue to be available. In addition, the function of “measurable goals” in the permitting process is clarified under the final rule. In order to address the *EDC* court's concerns about the lack of permitting authority review of the NOI, which contains information such as the MS4 operator's proposed measurable goals, the final rule clarifies that measurable goals are submitted in proposed form and must be reviewed and approved, and modified where necessary, by the permitting authority prior to becoming effective as enforceable requirements. Therefore, in the final rule, “measurable goals” are now “proposed measurable goals” that are submitted by an MS4 seeking an individual permit to implement the requirements in § 122.34, and at the discretion of the permitting authority, if included as required to be submitted in an NOI for coverage under a Two-Step General Permit under § 122.28(d)(2) as information necessary to establish permit conditions.

Some commenters favored keeping the requirements for a menu of BMPs as a way to promote equitable treatment among MS4s that have similar circumstances. While EPA has deleted the proviso that MS4s will not be held accountable for their selected measurable goals if a menu of BMPs has not been developed by the permitting authority, EPA does not expect permitting authorities to eliminate existing and future BMPs menus. Under § 123.35(g), an approved state is still obligated to establish BMP menus for the minimum control measures to facilitate effective program implementation. Not making information about BMPs available would be counter to effective program implementation. EPA anticipates that equity amongst MS4s will be further enhanced by the requirement for clear, specific, and measurable permit terms and conditions. It should be clear from any proposed general permit if similar MS4s are not being treated equitably and the public will have an opportunity to voice (through comments or a public hearing, if one is held) support or objections to different permit terms and conditions among MS4s. MS4s include a broad range of entities that, as noted by several commenters, are likely to

need different terms and conditions for their particular situations, *e.g.*, state departments of transportation that generally do not have the same police powers as local governments and who serve a largely transient audience. EPA also expects that dissimilar requirements for similar MS4s would be explained in the fact sheet or other document that provides the rationale for permit terms and conditions.

Finally, in the proposed rule, EPA used the term “Director” in place of “NPDES Permitting Authority” in §§ 122.33–122.35. This proposed revision was intended to use terminology in the Phase II regulations that is used in other sections of part 122. “Director” and “NPDES Permitting Authority” mean the same thing, *i.e.*, the Regional Administrator or the Director of an authorized State NPDES program, depending on which entity issues the NPDES permits in a particular area. EPA uses these terms interchangeably. However, for purposes of minimizing the number of changes not directly related to the remand, EPA has decided to retain the status quo with respect to how these terms are used currently. In the sections that address the small MS4 program (§§ 122.32–122.35), the final rule uses the term “NPDES permitting authority.” This is different than the terminology that was proposed. The other sections of part 122, for example, §§ 122.26 and 122.28, will continue to use the term “Director.”

VIII. Final Rule Implementation

A. When the Final Rule Must Be Implemented

EPA received comments from state permitting authorities requesting clarification on the implementation timeframe for the new rule. EPA also received comments from environmental organizations indicating that given the length of time since the Ninth Circuit found the procedural aspects of the Phase II regulations to be invalid, that permitting authorities should be required to modify their general permit procedures now to comport their program with the CWA requirements for permitting authority review and public participation, and also recommended that EPA should require current permits to be reopened for this purposes.

To clarify, this final rule becomes effective on January 9, 2017. It is not EPA's expectation that permitting authorities be required to reopen permits currently in effect to comply with the requirements of this final rule. However, EPA does expect that permitting authorities comply with the final rule when the next permit is being

issued following the expiration of the current permit. Having said this, EPA acknowledges that there are a small number of states whose permits are expiring within a few months of the final rule's effective date, and for these states it is likely too late in their process for them to make the necessary changes to fully comply with the final rule. Therefore, a permitting authority that has proposed a permit, is in the final stages of issuing a new permit (*e.g.*, after the close of the public comment period), or has issued a final permit before this rule becomes effective will not be expected to re-open those permits. Where the permitting authority has not yet proposed a permit, EPA expects that these permits will be issued consistent with the final rule's requirements.

EPA recognizes that development of a new small MS4 general permit starts well in advance of the expiration of existing permits. Still, EPA anticipates that most states can develop clear, specific, and measurable permit terms and conditions without the need for a change to their legal authorities to implement the type(s) of general permits it plans to use. The substantive standard has not changed (*i.e.*, the MS4 permit standard); the final rule merely clarifies the way in which permit terms and conditions that comply with the standard must be expressed and how they are established. Even where a state determines that it needs to change its regulations to establish new procedural requirements to implement the final rule, such as where a state establishes the general permit through a rulemaking process, it may be able to develop necessary permit terms and conditions consistent with the final rule based on its existing statutory authorities. In the event that states must change their legal authorities before they can act, the existing regulations at § 123.62 provides states up to one year to make the necessary changes and up to two years if a statutory change is needed.

B. Status of the 2004 Interim Guidance

This final rule, upon its effective date on January 9, 2017, establishes the requirements for issuing general permits for small MS4 discharges in response to the U.S. Court of Appeals for the Ninth Circuit's decision in *Environmental Defense Center v. EPA*. The 2004 Interim Guidance (*Implementing the Partial Remand of the Stormwater Phase II Regulations Regarding Notices of Intent & NPDES General Permitting for Phase II MS4s*, EPA (2004)), by its own terms, "provides interim guidance to EPA and State NPDES permitting authorities pending a rulemaking to conform the Phase II rule to the court's

order." With the promulgation of this final rule, the "interim guidance" is no longer needed.

IX. Consistency With the NPDES Electronic Reporting Rule

EPA issued a final NPDES Electronic Reporting Rule (referred to as the "eReporting Rule") requiring that permitting authorities and regulated entities electronically submit permit and reporting information instead of submitting paper forms. (80 FR 64064, Oct. 22, 2015) The promulgation of the eReporting Rule includes "data elements" (in appendix A of the rule) that must be reported on by both Phase II small MS4s and permitting authorities related to individual NOIs submitted for general permit coverage and required program reports. The data elements included in the eReporting Rule for Phase II MS4s are based on the regulatory requirements in existence at the time that rule was promulgated. These data elements, therefore, do not reflect changes that are being made to the corresponding requirements as part of this MS4 remand rule.

EPA received two public comments, which were similarly focused on the need to ensure consistency between the final MS4 remand rule and the eReporting Rule. One commenter recommended that EPA be prepared once the MS4 remand rule is finalized to make conforming regulatory changes to the eReporting Rule so that programs are again aligned. The other commenter also gave examples of how the wording of the eReporting data elements would be inconsistent with the rule language under consideration for Option 1 of the proposed MS4 remand rule. More specifically, the commenter questioned how permitting authorities would be able to populate the required data elements for the NOI for a general permit implemented under proposed Option 1 considering that information on the MS4 operator's BMPs and measurable goals would no longer be required as part of the NOI.

EPA agrees with the commenters on the importance of consistency between this final rule and the eReporting Rule. Because the appendix A data elements are no more than a reflection of what the NPDES regulations require for NOIs and compliance reports, where the underlying regulations change, as they are under the final MS4 remand rule, it is necessary to make conforming changes to appendix A. Now that the final MS4 remand rule language is set, there are some data elements that will need to be updated to conform to the new expectations for NOIs and program reports. EPA is aware of the following

types of inconsistencies between the final MS4 remand rule and the appendix A data elements related to small MS4s:

- References to "measurable goals" in data name and data descriptions associated with minimum control measures—Under the final MS4 remand rule, the MS4 operator's measurable goals no longer take on the same role that they did under the previous regulations. See related discussion in Section VII.E. Under the new regulations, the final terms and conditions in the general permit and any additional requirements developed through the Two-Step process, are what is relevant. References in appendix A to the permittee's measurable goals will need to be substituted with appropriate references to the final terms and conditions of the permit. Additional updates are also needed in some places in appendix A to change the reference from "measurable goals" to the applicable schedule or deadline for compliance with the specific permit requirement.

- References to the permittee's intended actions during the permit term—The data elements in appendix A, Table 2 describe a number of the minimum control measure elements as reflecting what the permittee intends to accomplish during the permit term. Under the final MS4 remand rule, the MS4's intended actions are not what the permittee is held to, but rather the final permit terms and conditions. Therefore, EPA will need to update any references to intended actions to reflect the fact that the terms and conditions of the permit are what is necessary to report as a data element.

- Regulatory citations—Updates are also necessary to the citations in appendix A to reflect changes made to the Phase II regulations by the final MS4 remand rule.

- NPDES Data Group Number (appendix A, Table 2)—This number corresponds to the entity that is required to provide information on the data element under the eReporting Rule. Table 1 of appendix A assigns a "Data Provider" number to various entities, which is reflected in Table 2. In the portion of appendix A related to information from the NOIs, the "Data Provider" for most of the minimum control measure data elements is indicated as the "Authorized NPDES Program" (or permitting authority) and/or the "NPDES Permittee." Because the permitting authority under the final MS4 remand rule is solely responsible for establishing final permit terms and conditions, EPA will need to update the

Data Provider to remove references to the NPDES Permittee, where applicable.

EPA has also discovered in reviewing this issue that it inadvertently omitted two data elements from the final eReporting Rule. These data elements correspond to the schedules, deadlines, and milestones that are specified in the permit for the pollution prevention and good housekeeping for municipal operations requirements established under § 122.34(b)(6), and any additional requirements that may be established under § 122.34(c).

EPA is interested in taking the time needed to ensure that the edits required to appendix A are made precisely. Due to the time constraints associated with finalizing the MS4 remand rule, EPA has determined that the updates needed in appendix A require a separate regulatory action outside of this rulemaking. In addition, EPA notes that the deadline for implementation of the affected eReporting rule provisions is December 21, 2020, therefore there should be sufficient time to make the necessary changes before electronic reporting is required under the regulations. EPA will initiate the rulemaking process immediately and will complete it as soon as possible. In the meantime, EPA will continue to work with its state counterparts to provide appropriate guidance on applying the data elements in the near term.

X. Statutory and Executive Orders Reviews

Additional information about these statutes and Executive Orders can be found at <http://www2.epa.gov/laws-regulations/laws-and-executive-orders>.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review. Any changes made in response to OMB recommendations have been documented in the docket for this action. In addition, EPA prepared an analysis of the potential costs associated with this action. This analysis, "Economic Analysis for the Municipal Separate Storm Sewer System (MS4) General Permit Remand Rule," is summarized in Section I.D and is available in the docket.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities

contained in the existing regulations and has assigned OMB control number 2040-0004.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. Although small MS4s are regulated under the Phase II regulations, this rule does not change the underlying requirements to which these entities are subject. Instead, the focus of this rule is on ensuring that the process by which NPDES permitting authorities authorize discharges from small MS4s using general permits comports with the legal requirements of the Clean Water Act and the applicable NPDES regulations.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of \$100 million or more as described in UMRA, 2 U.S.C. 1531-1538. This action does not significantly or uniquely affect small governments because this rulemaking focuses on the way in which state permitting authorities administer general permit coverage to small MS4s, and does not modify the underlying permit requirements to which they are subject. Nonetheless, EPA consulted with small governments concerning the regulatory requirements that might indirectly affect them, as described in Section I.E.

E. Executive Order 13132: Federalism

This rule will not have substantial direct effects on the states, the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. The rule makes changes to the way in which NPDES permitting authorities, including authorized state government agencies, provide general permit coverage to small MS4s. The impact to states which are NPDES permitting authorities may range from \$558,025 and \$604,770 annually, depending upon the rule option that is finalized. Details of this analysis are presented in "Economic Analysis for the Final Municipal Separate Storm Sewer System General Permit Remand Rule," which is available in the docket for the rule at <http://www.regulations.gov> under Docket ID No. EPA-HQ-OW-2015-0671.

Keeping with the spirit of E.O. 13132 and consistent with EPA's policy to promote communications between EPA and state and local governments, EPA

met with state and local officials throughout the process of developing the proposed rule and received feedback on how proposed options would affect them. EPA engaged in extensive outreach via conference calls to authorized states (e.g., individual state permitting authorities, and the Association of Clean Water Administrators) and regulated MS4s (e.g., the National Association of Clean Water Agencies, Water Environment Federation, National Association of Flood & Stormwater Management Agencies, National Municipal Stormwater Alliance) to gather input on how EPA's current regulations are affecting them, and to enable officials of affected state and local governments to have meaningful and timely input into the development of the options presented in this rule. EPA also reached out to a number of environmental organizations (e.g., American Rivers, Chesapeake Bay Foundation, Cahaba River Society, Natural Resources Defense Council, PennFuture, River Network) and regulated industry (e.g., National Association of Home Builders).

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175 since it does not have a direct substantial impact on one or more federally recognized tribes. The rule affects the way in which small MS4s are covered under a general permit for stormwater discharges and primarily affects the NPDES permitting authorities. No tribal governments are authorized NPDES permitting authorities at this time. The rule could have an indirect impact on an Indian tribe that is a regulated MS4 in that the NOI required for coverage under a general permit may be changed as a result of the rule (if finalized) or may be subject to closer scrutiny by the permitting authority and more of the requirements could be established as enforceable permit conditions. However, the substance of what an MS4 must do will not change significantly as a result of this rule. Thus, Executive Order 13175 does not apply to this action.

Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, EPA conducted outreach to tribal officials during the development of this action. EPA spoke with tribal members during a conference call with the National Tribal Water Council to gather input on how tribal governments are currently affected by MS4 regulations and may be affected by

the options in this rule. Based on this outreach and additional, internal analysis, EPA confirmed that this action would have little tribal impact.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that EPA has reason to believe may disproportionately affect children, per the definition of “covered regulatory action” in section 2–202 of the Executive Order. This action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not subject to Executive Order 13211, because it does not significantly affect energy supply, distribution, or use.

I. National Technology Transfer and Advancement Act

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

EPA determined that the human health or environmental risk addressed by this action will not have potential disproportionately high and adverse human health or environmental effects on minority, low-income, or indigenous populations. This action affects the procedures by which NPDES permitting authorities provide general permit coverage for small MS4s, to help ensure that small MS4s “reduce the discharge of pollutants to the maximum extent practicable (MEP), to protect water quality and to satisfy the water quality requirements of the Clean Water Act.” It does not change any current human health or environmental risk standards.

K. Congressional Review Act

This action is subject to the CRA, and EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a “major rule” as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 122

Environmental protection, Storm water, Water pollution.

Dated: November 17, 2016.

Gina McCarthy,
Administrator.

For the reasons stated in the preamble, EPA amends 40 CFR part 122 as set forth below:

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

■ 1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

■ 2. Amend § 122.28 by adding paragraph (d) to read as follows:

§ 122.28 General permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(d) *Small municipal separate storm sewer systems (MS4s)* (Applicable to State programs). For general permits issued under paragraph (b) of this section for small MS4s, the Director must establish the terms and conditions necessary to meet the requirements of § 122.34 using one of the two permitting approaches in paragraph (d)(1) or (2) of this section. The Director must indicate in the permit or fact sheet which approach is being used.

(1) *Comprehensive general permit.* The Director includes all required permit terms and conditions in the general permit; or

(2) *Two-step general permit.* The Director includes required permit terms and conditions in the general permit applicable to all eligible small MS4s and, during the process of authorizing small MS4s to discharge, establishes additional terms and conditions not included in the general permit to satisfy one or more of the permit requirements in § 122.34 for individual small MS4 operators.

(i) The general permit must require that any small MS4 operator seeking authorization to discharge under the general permit submit a Notice of Intent (NOI) consistent with § 122.33(b)(1)(ii).

(ii) The Director must review the NOI submitted by the small MS4 operator to determine whether the information in the NOI is complete and to establish the additional terms and conditions necessary to meet the requirements of § 122.34. The Director may require the small MS4 operator to submit additional information. If the Director makes a preliminary decision to authorize the small MS4 operator to discharge under the general permit, the Director must give the public notice of and opportunity to comment and request a

public hearing on its proposed authorization and the NOI, the proposed additional terms and conditions, and the basis for these additional requirements. The public notice, the process for submitting public comments and hearing requests, and the hearing process if a request for a hearing is granted, must follow the procedures applicable to draft permits set forth in §§ 124.10 through 124.13 (excluding § 124.10(c)(2)). The Director must respond to significant comments received during the comment period as provided in § 124.17.

(iii) Upon authorization for the MS4 to discharge under the general permit, the final additional terms and conditions applicable to the MS4 operator become effective. The Director must notify the permittee and inform the public of the decision to authorize the MS4 to discharge under the general permit and of the final additional terms and conditions specific to the MS4.

■ 3. Revise § 122.33 to read as follows:

§ 122.33 Requirements for obtaining permit coverage for regulated small MS4s.

(a) The operator of any regulated small MS4 under § 122.32 must seek coverage under an NPDES permit issued by the applicable NPDES permitting authority. If the small MS4 is located in an NPDES authorized State, Tribe, or Territory, then that State, Tribe, or Territory is the NPDES permitting authority. Otherwise, the NPDES permitting authority is the EPA Regional Office for the Region where the small MS4 is located.

(b) The operator of any regulated small MS4 must seek authorization to discharge under a general or individual NPDES permit, as follows:

(1) *General permit.* (i) If seeking coverage under a general permit issued by the NPDES permitting authority in accordance with § 122.28(d)(1), the small MS4 operator must submit a Notice of Intent (NOI) to the NPDES permitting authority consistent with § 122.28(b)(2). The small MS4 operator may file its own NOI, or the small MS4 operator and other municipalities or governmental entities may jointly submit an NOI. If the small MS4 operator wants to share responsibilities for meeting the minimum measures with other municipalities or governmental entities, the small MS4 operator must submit an NOI that describes which minimum measures it will implement and identify the entities that will implement the other minimum measures within the area served by the MS4. The general permit will explain any other steps necessary to obtain permit authorization.

(ii) If seeking coverage under a general permit issued by the NPDES permitting authority in accordance with § 122.28(d)(2), the small MS4 operator must submit an NOI to the Director consisting of the minimum required information in § 122.28(b)(2)(ii), and any other information the Director identifies as necessary to establish additional terms and conditions that satisfy the permit requirements of § 122.34, such as the information required under § 122.33(b)(2)(i). The general permit will explain any other steps necessary to obtain permit authorization.

(2) *Individual permit.* (i) If seeking authorization to discharge under an individual permit to implement a program under § 122.34, the small MS4 operator must submit an application to the appropriate NPDES permitting authority that includes the information required under § 122.21(f) and the following:

(A) The best management practices (BMPs) that the small MS4 operator or another entity proposes to implement for each of the storm water minimum control measures described in § 122.34(b)(1) through (6);

(B) The proposed measurable goals for each of the BMPs including, as appropriate, the months and years in which the small MS4 operator proposes to undertake required actions, including interim milestones and the frequency of the action;

(C) The person or persons responsible for implementing or coordinating the storm water management program;

(D) An estimate of square mileage served by the small MS4;

(E) Any additional information that the NPDES permitting authority requests; and

(F) A storm sewer map that satisfies the requirement of § 122.34(b)(3)(i) satisfies the map requirement in § 122.21(f)(7).

(ii) If seeking authorization to discharge under an individual permit to implement a program that is different from the program under § 122.34, the small MS4 operator must comply with the permit application requirements in § 122.26(d). The small MS4 operator must submit both parts of the application requirements in § 122.26(d)(1) and (2). The small MS4 operator must submit the application at least 180 days before the expiration of the small MS4 operator's existing permit. Information required by § 122.26(d)(1)(ii) and (d)(2) regarding its legal authority is not required, unless the small MS4 operator intends for the permit writer to take such information

into account when developing other permit conditions.

(iii) If allowed by your NPDES permitting authority, the small MS4 operator and another regulated entity may jointly apply under either paragraph (b)(2)(i) or (ii) of this section to be co-permittees under an individual permit.

(3) *Co-permittee alternative.* If the regulated small MS4 is in the same urbanized area as a medium or large MS4 with an NPDES storm water permit and that other MS4 is willing to have the small MS4 operator participate in its storm water program, the parties may jointly seek a modification of the other MS4 permit to include the small MS4 operator as a limited co-permittee. As a limited co-permittee, the small MS4 operator will be responsible for compliance with the permit's conditions applicable to its jurisdiction. If the small MS4 operator chooses this option it must comply with the permit application requirements of § 122.26, rather than the requirements of § 122.33(b)(2)(i). The small MS4 operator does not need to comply with the specific application requirements of § 122.26(d)(1)(iii) and (iv) and (d)(2)(iii) (discharge characterization). The small MS4 operator may satisfy the requirements in § 122.26 (d)(1)(v) and (d)(2)(iv) (identification of a management program) by referring to the other MS4's storm water management program.

(4) *Guidance for paragraph (b)(3) of this section.* In referencing the other MS4 operator's storm water management program, the small MS4 operator should briefly describe how the existing program will address discharges from the small MS4 or would need to be supplemented in order to adequately address the discharges. The small MS4 operator should also explain its role in coordinating storm water pollutant control activities in the MS4, and detail the resources available to the small MS4 operator to accomplish the program.

(c) If the regulated small MS4 is designated under § 122.32(a)(2), the small MS4 operator must apply for coverage under an NPDES permit, or apply for a modification of an existing NPDES permit under paragraph (b)(3) of this section, within 180 days of notice of such designation, unless the NPDES permitting authority grants a later date.

■ 4. Revise § 122.34 to read as follows:

§ 122.34 Permit requirements for regulated small MS4 permits.

(a) *General requirements.* For any permit issued to a regulated small MS4, the NPDES permitting authority must

include permit terms and conditions to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Terms and conditions that satisfy the requirements of this section must be expressed in clear, specific, and measurable terms. Such terms and conditions may include narrative, numeric, or other types of requirements (e.g., implementation of specific tasks or best management practices (BMPs), BMP design requirements, performance requirements, adaptive management requirements, schedules for implementation and maintenance, and frequency of actions).

(1) For permits providing coverage to any small MS4s for the first time, the NPDES permitting authority may specify a time period of up to 5 years from the date of permit issuance for the permittee to fully comply with the conditions of the permit and to implement necessary BMPs.

(2) For each successive permit, the NPDES permitting authority must include terms and conditions that meet the requirements of this section based on its evaluation of the current permit requirements, record of permittee compliance and program implementation progress, current water quality conditions, and other relevant information.

(b) *Minimum control measures.* The permit must include requirements that ensure the permittee implements, or continues to implement, the minimum control measures in paragraphs (b)(1) through (6) of this section during the permit term. The permit must also require a written storm water management program document or documents that, at a minimum, describes in detail how the permittee intends to comply with the permit's requirements for each minimum control measure.

(1) *Public education and outreach on storm water impacts.* (i) The permit must identify the minimum elements and require implementation of a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: The permittee may use storm water educational materials provided by the State, Tribe, EPA, environmental, public interest or trade organizations, or other MS4s. The public education program

should inform individuals and households about the steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes. EPA recommends that the program inform individuals and groups how to become involved in local stream and beach restoration activities as well as activities that are coordinated by youth service and conservation corps or other citizen groups. EPA recommends that the permit require the permittee to tailor the public education program, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed and beach cleanups. In addition, EPA recommends that the permit require that some of the materials or outreach programs be directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, providing information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. The permit should encourage the permittee to tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children.

(2) *Public involvement/participation.*

(i) The permit must identify the minimum elements and require implementation of a public involvement/participation program that complies with State, Tribal, and local public notice requirements.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: EPA recommends that the permit include provisions addressing the need for the public to be included in developing, implementing, and reviewing the storm water management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. Opportunities for members of the public

to participate in program development and implementation include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts. (Citizens should obtain approval where necessary for lawful access to monitoring sites.)

(3) *Illicit discharge detection and elimination.* (i) The permit must identify the minimum elements and require the development, implementation, and enforcement of a program to detect and eliminate illicit discharges (as defined at § 122.26(b)(2)) into the small MS4. At a minimum, the permit must require the permittee to:

(A) Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;

(B) To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions;

(C) Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the system; and

(D) Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

(ii) The permit must also require the permittee to address the following categories of non-storm water discharges or flows (*i.e.*, illicit discharges) only if the permittee identifies them as a significant contributor of pollutants to the small MS4: Water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(b)(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from firefighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of

pollutants to waters of the United States).

(iii) Guidance for NPDES permitting authorities and regulated small MS4s: EPA recommends that the permit require the plan to detect and address illicit discharges include the following four components: Procedures for locating priority areas likely to have illicit discharges; procedures for tracing the source of an illicit discharge; procedures for removing the source of the discharge; and procedures for program evaluation and assessment. EPA recommends that the permit require the permittee to visually screen outfalls during dry weather and conduct field tests of selected pollutants as part of the procedures for locating priority areas. Illicit discharge education actions may include storm drain stenciling, a program to promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials.

(4) *Construction site storm water runoff control.* (i) The permit must identify the minimum elements and require the development, implementation, and enforcement of a program to reduce pollutants in any storm water runoff to the small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the Director waives requirements for storm water discharges associated with small construction activity in accordance with § 122.26(b)(15)(i), the permittee is not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites. At a minimum, the permit must require the permittee to develop and implement:

(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;

(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;

(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

(D) Procedures for site plan review which incorporate consideration of potential water quality impacts;

(E) Procedures for receipt and consideration of information submitted by the public, and

(F) Procedures for site inspection and enforcement of control measures.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: Examples of sanctions to ensure compliance include non-monetary penalties, fines, bonding requirements and/or permit denials for non-compliance. EPA recommends that the procedures for site plan review include the review of individual pre-construction site plans to ensure consistency with local sediment and erosion control requirements. Procedures for site inspections and enforcement of control measures could include steps to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and receiving water quality. EPA also recommends that the permit require the permittee to provide appropriate educational and training measures for construction site operators, and require storm water pollution prevention plans for construction sites within the MS4's jurisdiction that discharge into the system. See § 122.44(s) (NPDES permitting authorities' option to incorporate qualifying State, Tribal and local erosion and sediment control programs into NPDES permits for storm water discharges from construction sites). Also see § 122.35(b) (The NPDES permitting authority may recognize that another government entity, including the NPDES permitting authority, may be responsible for implementing one or more of the minimum measures on the permittee's behalf).

(5) *Post-construction storm water management in new development and redevelopment.* (i) The permit must identify the minimum elements and require the development, implementation, and enforcement of a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the small MS4. The permit must ensure that controls are in place that would prevent or minimize water quality impacts. At a minimum, the permit must require the permittee to:

(A) Develop and implement strategies which include a combination of structural and/or non-structural best

management practices (BMPs) appropriate for the community;

(B) Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; and

(C) Ensure adequate long-term operation and maintenance of BMPs.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. EPA recommends that the permit ensure that BMPs included in the program: Be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. EPA encourages the permittee to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, EPA recommends that the permit require the permittee to adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing the program, the permit should also require the permittee to assess existing ordinances, policies, programs and studies that address storm water runoff quality. In addition to assessing these existing documents and programs, the permit should require the permittee to provide opportunities to the public to participate in the development of the program. Non-structural BMPs are preventative actions that involve management and source controls such as: Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; policies or ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure; education programs for

developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas. Structural BMPs include: Storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. EPA recommends that the permit ensure the appropriate implementation of the structural BMPs by considering some or all of the following: Pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Storm water technologies are constantly being improved, and EPA recommends that the permit requirements be responsive to these changes, developments or improvements in control technologies.

(6) *Pollution prevention/good housekeeping for municipal operations.*

(i) The permit must identify the minimum elements and require the development and implementation of an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, the State, Tribe, or other organizations, the program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

(ii) Guidance for NPDES permitting authorities and regulated small MS4s: EPA recommends that the permit address the following: Maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from the separate storm sewers; controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas operated by the permittee, and waste transfer stations; procedures for properly disposing of waste removed from the separate storm

sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris); and ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices. Operation and maintenance should be an integral component of all storm water management programs. This measure is intended to improve the efficiency of these programs and require new programs where necessary. Properly developed and implemented operation and maintenance programs reduce the risk of water quality problems.

(c) *Other applicable requirements.* As appropriate, the permit will include:

(1) More stringent terms and conditions, including permit requirements that modify, or are in addition to, the minimum control measures based on an approved total maximum daily load (TMDL) or equivalent analysis, or where the Director determines such terms and conditions are needed to protect water quality.

(2) Other applicable NPDES permit requirements, standards and conditions established in the individual or general permit, developed consistent with the provisions of §§ 122.41 through 122.49.

(d) *Evaluation and assessment requirements*—(1) *Evaluation.* The permit must require the permittee to evaluate compliance with the terms and conditions of the permit, including the effectiveness of the components of its storm water management program, and the status of achieving the measurable requirements in the permit.

Note to paragraph (d)(1): The NPDES permitting authority may determine monitoring requirements for the permittee in accordance with State/Tribal monitoring plans appropriate to the watershed. Participation in a group monitoring program is encouraged.

(2) *Recordkeeping.* The permit must require that the permittee keep records required by the NPDES permit for at least 3 years and submit such records to the NPDES permitting authority when specifically asked to do so. The permit must require the permittee to make records, including a written description of the storm water management

program, available to the public at reasonable times during regular business hours (see § 122.7 for confidentiality provision). (The permittee may assess a reasonable charge for copying. The permit may allow the permittee to require a member of the public to provide advance notice.)

(3) *Reporting.* Unless the permittee is relying on another entity to satisfy its NPDES permit obligations under § 122.35(a), the permittee must submit annual reports to the NPDES permitting authority for its first permit term. For subsequent permit terms, the permittee must submit reports in year two and four unless the NPDES permitting authority requires more frequent reports. As of December 21, 2020 all reports submitted in compliance with this section must be submitted electronically by the owner, operator, or the duly authorized representative of the small MS4 to the NPDES permitting authority or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, the owner, operator, or the duly authorized representative of the small MS4 may be required to report electronically if specified by a particular permit or if required to do so by state law. The report must include:

(i) The status of compliance with permit terms and conditions;

(ii) Results of information collected and analyzed, including monitoring data, if any, during the reporting period;

(iii) A summary of the storm water activities the permittee proposes to undertake to comply with the permit during the next reporting cycle;

(iv) Any changes made during the reporting period to the permittee's storm water management program; and

(v) Notice that the permittee is relying on another governmental entity to satisfy some of the permit obligations (if applicable), consistent with § 122.35(a).

(e) *Qualifying local program.* If an existing qualifying local program requires the permittee to implement one or more of the minimum control measures of paragraph (b) of this

section, the NPDES permitting authority may include conditions in the NPDES permit that direct the permittee to follow that qualifying program's requirements rather than the requirements of paragraph (b). A qualifying local program is a local, State or Tribal municipal storm water management program that imposes, at a minimum, the relevant requirements of paragraph (b).

■ 5. Amend § 122.35 by revising the section heading and paragraph (a) to read as follows:

§ 122.35 May the operator of a regulated small MS4 share the responsibility to implement the minimum control measures with other entities?

(a) The permittee may rely on another entity to satisfy its NPDES permit obligations to implement a minimum control measure if:

(1) The other entity, in fact, implements the control measure;

(2) The particular control measure, or component thereof, is at least as stringent as the corresponding NPDES permit requirement; and

(3) The other entity agrees to implement the control measure on the permittee's behalf. In the reports, the permittee must submit under § 122.34(d)(3), the permittee must also specify that it is relying on another entity to satisfy some of the permit obligations. If the permittee is relying on another governmental entity regulated under section 122 to satisfy all of the permit obligations, including the obligation to file periodic reports required by § 122.34(d)(3), the permittee must note that fact in its NOI, but the permittee is not required to file the periodic reports. The permittee remains responsible for compliance with the permit obligations if the other entity fails to implement the control measure (or component thereof). Therefore, EPA encourages the permittee to enter into a legally binding agreement with that entity if the permittee wants to minimize any uncertainty about compliance with the permit.

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[FR Doc. 2016-28426 Filed 12-8-16; 8:45 am]

BILLING CODE 6560-50-P

ATTACHMENT 9



KeyCite Yellow Flag - Negative Treatment

Proposed Legislation

[West's Annotated California Codes](#)

[Constitution of the State of California 1879 \(Refs & Annos\)](#)

[Article XIII.C. \[Voter Approval for Local Tax Levies\] \(Refs & Annos\)](#)

West's Ann.Cal.Const. Art. 13C, § 1

§ 1. Definitions

Effective: November 3, 2010

[Currentness](#)

SECTION 1. Definitions. As used in this article:

- (a) “General tax” means any tax imposed for general governmental purposes.
- (b) “Local government” means any county, city, city and county, including a charter city or county, any special district, or any other local or regional governmental entity.
- (c) “Special district” means an agency of the State, formed pursuant to general law or a special act, for the local performance of governmental or proprietary functions with limited geographic boundaries including, but not limited to, school districts and redevelopment agencies.
- (d) “Special tax” means any tax imposed for specific purposes, including a tax imposed for specific purposes, which is placed into a general fund.
- (e) As used in this article, “tax” means any levy, charge, or exaction of any kind imposed by a local government, except the following:
 - (1) A charge imposed for a specific benefit conferred or privilege granted directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of conferring the benefit or granting the privilege.
 - (2) A charge imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of providing the service or product.
 - (3) A charge imposed for the reasonable regulatory costs to a local government for issuing licenses and permits, performing investigations, inspections, and audits, enforcing agricultural marketing orders, and the administrative enforcement and adjudication thereof.

(4) A charge imposed for entrance to or use of local government property, or the purchase, rental, or lease of local government property.

(5) A fine, penalty, or other monetary charge imposed by the judicial branch of government or a local government, as a result of a violation of law.

(6) A charge imposed as a condition of property development.

(7) Assessments and property-related fees imposed in accordance with the provisions of Article XIII D.

The local government bears the burden of proving by a preponderance of the evidence that a levy, charge, or other exaction is not a tax, that the amount is no more than necessary to cover the reasonable costs of the governmental activity, and that the manner in which those costs are allocated to a payor bear a fair or reasonable relationship to the payor's burdens on, or benefits received from, the governmental activity.

Credits

(Added by [Initiative Measure \(Prop. 218, § 3, approved Nov. 5, 1996\)](#). Amended by [Initiative Measure \(Prop. 26, § 3, approved Nov. 2, 2010, eff. Nov. 3, 2010\)](#).)

[Notes of Decisions \(68\)](#)

West's Ann. Cal. Const. Art. 13C, § 1, CA CONST Art. 13C, § 1
Current with urgency legislation through Ch. 859 of 2017 Reg.Sess

ATTACHMENT 10

West's Annotated California Codes

Government Code (Refs & Annos)

Title 2. Government of the State of California

Division 4. Fiscal Affairs (Refs & Annos)

Part 7. State-Mandated Local Costs (Refs & Annos)

Chapter 4. Identification and Payment of Costs Mandated by the State (Refs & Annos)

Article 1. Commission Procedure (Refs & Annos)

West's Ann.Cal.Gov.Code § 17551

§ 17551. Hearing and decision on claims

Effective: January 1, 2008

[Currentness](#)

(a) The commission, pursuant to the provisions of this chapter, shall hear and decide upon a claim by a local agency or school district that the local agency or school district is entitled to be reimbursed by the state for costs mandated by the state as required by [Section 6 of Article XIII B of the California Constitution](#).

(b) Except as provided in [Sections 17573](#) and [17574](#), commission review of claims may be had pursuant to subdivision (a) only if the test claim is filed within the time limits specified in this section.

(c) Local agency and school district test claims shall be filed not later than 12 months following the effective date of a statute or executive order, or within 12 months of incurring increased costs as a result of a statute or executive order, whichever is later.

(d) The commission, pursuant to the provisions of this chapter, shall hear and decide upon a claim by a local agency or school district filed on or after January 1, 1985, that the Controller has incorrectly reduced payments to the local agency or school district pursuant to [paragraph \(2\) of subdivision \(d\) of Section 17561](#).

Credits

(Added by Stats.1984, c. 1459, § 1. Amended by Stats.1985, c. 179, § 5, eff. July 8, 1985, operative Jan. 1, 1985; Stats.1986, c. 879, § 2; Stats.2002, c. 1124 (A.B.3000), § 30.2, eff. Sept. 30, 2002; Stats.2004, c. 890 (A.B.2856), § 11; Stats.2007, c. 329 (A.B.1222), § 3.)

[Notes of Decisions \(5\)](#)

West's Ann. Cal. Gov. Code § 17551, CA GOVT § 17551

Current with urgency legislation through Ch. 859 of 2017 Reg.Sess

ATTACHMENT 11

West's Annotated California Codes

Government Code (Refs & Annos)

Title 2. Government of the State of California

Division 4. Fiscal Affairs (Refs & Annos)

Part 7. State-Mandated Local Costs (Refs & Annos)

Chapter 4. Identification and Payment of Costs Mandated by the State (Refs & Annos)

Article 1. Commission Procedure (Refs & Annos)

West's Ann.Cal.Gov.Code § 17553

§ 17553. Procedures for receiving and hearing claims; filing of test claims; form and contents; incomplete test claims; determination of complete incorrect reduction claim

Effective: January 1, 2008

[Currentness](#)

(a) The commission shall adopt procedures for receiving claims filed pursuant to this article and [Section 17574](#) and for providing a hearing on those claims. The procedures shall do all of the following:

(1) Provide for presentation of evidence by the claimant, the Department of Finance, and any other affected department or agency, and any other interested person.

(2) Ensure that a statewide cost estimate is adopted within 12 months after receipt of a test claim, when a determination is made by the commission that a mandate exists. This deadline may be extended for up to six months upon the request of either the claimant or the commission.

(3) Permit the hearing of a claim to be postponed at the request of the claimant, without prejudice, until the next scheduled hearing.

(b) All test claims shall be filed on a form prescribed by the commission and shall contain at least the following elements and documents:

(1) A written narrative that identifies the specific sections of statutes or executive orders and the effective date and register number of regulations alleged to contain a mandate and shall include all of the following:

(A) A detailed description of the new activities and costs that arise from the mandate.

(B) A detailed description of existing activities and costs that are modified by the mandate.

(C) The actual increased costs incurred by the claimant during the fiscal year for which the claim was filed to implement the alleged mandate.

(D) The actual or estimated annual costs that will be incurred by the claimant to implement the alleged mandate during the fiscal year immediately following the fiscal year for which the claim was filed.

(E) A statewide cost estimate of increased costs that all local agencies or school districts will incur to implement the alleged mandate during the fiscal year immediately following the fiscal year for which the claim was filed.

(F) Identification of all of the following:

(i) Dedicated state funds appropriated for this program.

(ii) Dedicated federal funds appropriated for this program.

(iii) Other nonlocal agency funds dedicated for this program.

(iv) The local agency's general purpose funds for this program.

(v) Fee authority to offset the costs of this program.

(G) Identification of prior mandate determinations made by the Commission on State Mandates or a predecessor agency that may be related to the alleged mandate.

(H) Identification of a legislatively determined mandate pursuant to [Section 17573](#) that is on the same statute or executive order.

(2) The written narrative shall be supported with declarations under penalty of perjury, based on the declarant's personal knowledge, information, or belief, and signed by persons who are authorized and competent to do so, as follows:

(A) Declarations of actual or estimated increased costs that will be incurred by the claimant to implement the alleged mandate.

(B) Declarations identifying all local, state, or federal funds, or fee authority that may be used to offset the increased costs that will be incurred by the claimant to implement the alleged mandate, including direct and indirect costs.

(C) Declarations describing new activities performed to implement specified provisions of the new statute or executive order alleged to impose a reimbursable state-mandated program. Specific references shall be made to chapters, articles, sections, or page numbers alleged to impose a reimbursable state-mandated program.

(D) If applicable, declarations describing the period of reimbursement and payments received for full reimbursement of costs for a legislatively determined mandate pursuant to [Section 17573](#), and the authority to file a test claim pursuant to [paragraph \(1\) of subdivision \(c\) of Section 17574](#).

(3)(A) The written narrative shall be supported with copies of all of the following:

(i) The test claim statute that includes the bill number or executive order, alleged to impose or impact a mandate.

(ii) Relevant portions of state constitutional provisions, federal statutes, and executive orders that may impact the alleged mandate.

(iii) Administrative decisions and court decisions cited in the narrative.

(B) State mandate determinations made by the Commission on State Mandates or a predecessor agency and published court decisions on state mandate determinations made by the Commission on State Mandates are exempt from this requirement.

(4) A test claim shall be signed at the end of the document, under penalty of perjury by the claimant or its authorized representative, with the declaration that the test claim is true and complete to the best of the declarant's personal knowledge, information, or belief. The date of signing, the declarant's title, address, telephone number, facsimile machine telephone number, and electronic mail address shall be included.

(c) If a completed test claim is not received by the commission within 30 calendar days from the date that an incomplete test claim was returned by the commission, the original test claim filing date may be disallowed, and a new test claim may be accepted on the same statute or executive order.

(d) In addition, the commission shall determine whether an incorrect reduction claim is complete within 10 days after the date that the incorrect reduction claim is filed. If the commission determines that an incorrect reduction claim is not complete, the commission shall notify the local agency and school district that filed the claim stating the reasons that the claim is not complete. The local agency or school district shall have 30 days to complete the claim. The commission shall serve a copy of the complete incorrect reduction claim on the Controller. The Controller shall have no more than 90 days after the date the claim is delivered or mailed to file any rebuttal to an incorrect reduction claim. The failure of the Controller to file a rebuttal to an incorrect reduction claim shall not serve to delay the consideration of the claim by the commission.

Credits

(Added by [Stats.1995, c. 945 \(S.B.11\)](#), § 5, operative July 1, 1996. Amended by [Stats.1998, c. 681 \(A.B.1963\)](#), § 1, eff. Sept. 22, 1998; [Stats.1999, c. 643 \(A.B.1679\)](#), § 3; [Stats.2004, c. 890 \(A.B.2856\)](#), § 12; [Stats.2006, c. 538 \(S.B.1852\)](#), § 278; [Stats.2007, c. 329 \(A.B.1222\)](#), § 4.)

West's Ann. Cal. Gov. Code § 17553, CA GOVT § 17553

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ATTACHMENT 12

West's Annotated California Codes

Water Code (Refs & Annos)

Division 7. Water Quality (Refs & Annos)

Chapter 5. Enforcement and Implementation (Refs & Annos)

Article 2. Administrative Review by the State Board (Refs & Annos)

West's Ann.Cal.Water Code § 13320

§ 13320. Review of action or failure to act by regional boards; evidence; findings and action by state board; disagreements between regional boards; petitions including stay provisions

Effective: January 1, 2011

[Currentness](#)

(a) Within 30 days of any action or failure to act by a regional board under [subdivision \(c\) of Section 13225](#), Article 4 (commencing with [Section 13260](#)) of Chapter 4, Chapter 5 (commencing with [Section 13300](#)), Chapter 5.5 (commencing with [Section 13370](#)), Chapter 5.9 (commencing with [Section 13399.25](#)), or Chapter 7 (commencing with [Section 13500](#)), an aggrieved person may petition the state board to review that action or failure to act. In case of a failure to act, the 30-day period shall commence upon the refusal of the regional board to act, or 60 days after request has been made to the regional board to act. The state board may, on its own motion, at any time, review the regional board's action or failure to act.

(b) The evidence before the state board shall consist of the record before the regional board, and any other relevant evidence which, in the judgment of the state board, should be considered to effectuate and implement the policies of this division.

(c) The state board may find that the action of the regional board, or the failure of the regional board to act, was appropriate and proper. Upon finding that the action of the regional board, or the failure of the regional board to act, was inappropriate or improper, the state board may direct that the appropriate action be taken by the regional board, refer the matter to another state agency having jurisdiction, take the appropriate action itself, or take any combination of those actions. In taking any action, the state board is vested with all the powers of the regional boards under this division.

(d) If a waste discharge in one region affects the waters in another region and there is any disagreement between the regional boards involved as to the requirements that should be established, either regional board may submit the disagreement to the state board, which shall determine the applicable requirements.

(e) If a petition for state board review of a regional board action on waste discharge requirements includes a request for a stay of the waste discharge requirements, the state board shall act on the requested stay portion of the petition within 60 days of accepting the petition. The board may order any stay to be in effect from the effective date of the waste discharge requirements.

Credits

(Added by Stats.1969, c. 482, p. 1068, § 18, operative Jan. 1, 1970. Amended by Stats.1969, c. 800, p. 1620, § 4.5, operative Jan. 1, 1970; Stats.1970, c. 902, § 1.5; Stats.1970, c. 956, § 2; Stats.1971, c. 1288, p. 2526, § 12; Stats.1975, c. 888, p. 1967,

§ 1; Stats.1982, c. 90, p. 292, § 7, eff. March 2, 1982; Stats.1993, c. 656 (A.B.1220), § 58, eff. Oct. 1, 1993; Stats.1998, c. 998 (A.B.2019), § 2.5; Stats.2002, c. 324 (S.B.1599), § 1; Stats.2010, c. 288 (S.B.1169), § 30.)

[Notes of Decisions \(16\)](#)

West's Ann. Cal. Water Code § 13320, CA WATER § 13320

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ATTACHMENT 13

West's Annotated California Codes

Water Code (Refs & Annos)

Division 7. Water Quality (Refs & Annos)

Chapter 5.5. Compliance with the Provisions of the Federal Water Pollution Control Act as Amended in 1972 (Refs & Annos)

West's Ann.Cal.Water Code § 13370

§ 13370. Legislative findings and declarations

Currentness

The Legislature finds and declares as follows:

(a) The Federal Water Pollution Control Act ([33 U.S.C. Sec. 1251 et seq.](#)), as amended, provides for permit systems to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the United States and to regulate the use and disposal of sewage sludge.

(b) The Federal Water Pollution Control Act, as amended, provides that permits may be issued by states which are authorized to implement the provisions of that act.

(c) It is in the interest of the people of the state, in order to avoid direct regulation by the federal government of persons already subject to regulation under state law pursuant to this division, to enact this chapter in order to authorize the state to implement the provisions of the Federal Water Pollution Control Act and acts amendatory thereof or supplementary thereto, and federal regulations and guidelines issued pursuant thereto, provided, that the state board shall request federal funding under the Federal Water Pollution Control Act for the purpose of carrying out its responsibilities under this program.

Credits

(Added by Stats.1972, c. 1256, p. 2485, § 1, eff. Dec. 19, 1972. Amended by Stats.1978, c. 746, p. 2343, § 1; Stats.1980, c. 676, p. 2028, § 319; [Stats.1987, c. 1189, § 1.](#))

[Notes of Decisions \(4\)](#)

West's Ann. Cal. Water Code § 13370, CA WATER § 13370

Current with urgency legislation through Ch. 859 of 2017 Reg.Sess

ATTACHMENT 14

West's Annotated California Codes

Water Code (Refs & Annos)

Division 7. Water Quality (Refs & Annos)

Chapter 5.5. Compliance with the Provisions of the Federal Water Pollution Control Act as Amended in 1972 (Refs & Annos)

West's Ann.Cal.Water Code § 13372

§ 13372. Construction and application of chapter

Effective: January 1, 2004

[Currentness](#)

(a) This chapter shall be construed to ensure consistency with the requirements for state programs implementing the Federal Water Pollution Control Act and acts amendatory thereof or supplementary thereto. To the extent other provisions of this division are consistent with the provisions of this chapter and with the requirements for state programs implementing the Federal Water Pollution Control Act and acts amendatory thereof or supplementary thereto, those provisions apply to actions and procedures provided for in this chapter. The provisions of this chapter shall prevail over other provisions of this division to the extent of any inconsistency. The provisions of this chapter apply only to actions required under the Federal Water Pollution Control Act and acts amendatory thereof or supplementary thereto.

(b) The provisions of [Section 13376](#) requiring the filing of a report for the discharge of dredged or fill material and the provisions of this chapter relating to the issuance of dredged or fill material permits by the state board or a regional board shall be applicable only to discharges for which the state has an approved permit program, in accordance with the provisions of the Federal Water Pollution Control Act, as amended, for the discharge of dredged or fill material.

Credits

(Added by Stats.1972, c. 1256, p. 2485, § 1, eff. Dec. 19, 1972. Amended by [Stats.1987, c. 1189, § 3](#); [Stats.2003, c. 683 \(A.B.897\), § 5](#).)

[Notes of Decisions \(3\)](#)

West's Ann. Cal. Water Code § 13372, CA WATER § 13372

Current with urgency legislation through Ch. 859 of 2017 Reg.Sess

ATTACHMENT 15

Ventura County Watershed Protection Act

California Water Code Appendix, Chapter 46

§ 46Ā Creation; name; boundaries

Section 1.

(a) A flood control district is hereby created to be called "Ventura County Watershed Protection District" (district). The boundaries and territory of that district shall be: all the territory of the County of Ventura lying within the exterior boundaries of the county but excluding the islands of Anacapa and San Nicholas.

(b) This act officially changed the name of the district from the Ventura County Flood Control District to the Ventura County Watershed Protection District.

§ 46Ē Zones

Section 2. Said district is hereby divided into four zones which shall be numbered and denominated Zone One, Zone Two, Zone Three, and Zone Four.

§ 46Ċ Zone one

Section 3. Zone One shall comprise all that territory and area included within the following described boundaries:

Beginning at a point in the boundary line common to Ventura and Santa Barbara Counties in the shore line of the Pacific Ocean; thence, northerly along the said boundary line to the intersection of said boundary line with the north line of section 29, township 6 north, range 24 west, San Bernardino Base & Meridian; thence, east along the north line of sections 29 and 28 of said township and range to the northeast corner of section 28; thence, south along the east line of said section 28 to the one-quarter corner common to sections 27 and 28 of said township and range; thence, east through the center of sections 27 and 26, said township and range, to the one-quarter corner common to sections 26 and 25; thence, south along the west line of said section 25 to the southwest corner thereof; thence, east along the south line of said section 25, and the south line of section 30, township 6 north, range 23 west San Bernardino Base and Meridian to the northeast corner of section 31; thence, south along the east line of said section 31 to the township line between township 6 north and 5 north, San Bernardino Base & Meridian; thence, east along said township line to the northwest corner of section 6, township 5 north, range 23 west, San Bernardino Base; thence, south along the west line of said section 6 to the northwest corner of the south half of said section 6; thence, east along the north line of the south half of sections 6, 5, 4, 3, 2, and 1 of said township and range to the range line between ranges 23 west and 22 west San Bernardino Meridian; thence, south along the west line of section 6, township 5 north, range 22 west, San Bernardino

Base & Meridian, to the southwest corner of said section; thence, east along the south line of said section 6, to the one-quarter corner common to sections 6 and 7 of said township; thence, south through the center of said section 7, to the one-quarter corner common to sections 7 and 18 of said township and range; thence, east along the south line of sections 7, 8, 9, and 10, to the one-quarter corner common to sections 10 and 15 of the said township and range; thence, south through the center of sections 15 and 22 to the center of section 22, said township and range; thence, east through the center of sections 22 and 23 to the one-quarter corner common to sections 23 and 24, of said township and range; thence, south along the east line of sections 23, 26 and 35 of said township and range, and the east line of sections 2 and 11 of township 4 north, range 22 west San Bernardino Base & Meridian to the north line of Rancho Ojai, as per map recorded at page 25 1/2 of Book 5 miscellaneous records (maps) of Ventura County; thence, easterly along the north line of the Rancho Ojai to the line common to tracts 35 and 36 of said Rancho; thence, south along the line common to tracts 35 and 36 of said Rancho to the line common to the Rancho Ojai and fractional township 4 north, range 22 west, San Bernardino Base & Meridian; thence, westerly along said boundary line to the northwest corner of section 21 of township 4 north, range 22 west San Bernardino Base & Meridian; thence, south along the west line of said section 21 to the north line of the Aliso tract of the Rancho Ex-Mission as per map of said Aliso tract, recorded at page 9 of Book 3, miscellaneous records (maps), of Ventura County; thence, west along the northerly boundary of said Aliso tract, to the northwest corner of lot 5 of subdivision G of said tract; thence, south along the west line of subdivisions G and E of said Aliso tract to the southwest corner of said subdivision E, same being in the north line of fractional township 3 north, range 22 west, San Bernardino Base & Meridian; thence, west along the north line of said fractional township to the northwest corner of fractional section 8 of said township and range; thence, south along the west line of fractional section 8 to the southwest corner of said section; thence, west along the north line of section 18 of said township and range to the northeast corner of lot 1 of said section 18; thence, south along the east line of lots 1, 2, 3, and 4 of said section 18, and east line of lots 2 and 3 of section 19, said township and range, to the south line of said section 19; thence, easterly along the south line of said section 19 to the northeast corner of the Mariano Rancho as per map recorded at page 34, Book 5, miscellaneous records (map), of Ventura County; thence, southerly along the easterly line of the said Mariano Rancho to the southeast corner of lot 8 of said Rancho; thence, south 4° 30' east, 1,566.4 feet more or less to the south line of the Rancho Ex-Mission as per map recorded at page 103 of Book 2, miscellaneous records, of Ventura County; thence, southwesterly along the south line of the Rancho Ex-Mission to the easterly limits of the City of Ventura, thence, southeasterly along the said City limits, same being the westerly line of lots D and M, of the Eells tract as per map recorded at Page 14, Book 1 of County Surveyor's records and the southerly prolongation of said line to the Southerly line of Telegraph Road; thence, westerly along the southerly line of Telegraph Road to the intersection with the northeasterly line of Ventura Boulevard, also known as U.S. Highway #101; thence, south 39° 0' west along said Ventura City limits, a distance of 3,924.31 feet more or less to the "bluff line"; thence,

northwesterly along said "bluff line" to an angle point in said City limits; thence, south 58° 30' west along said Ventura City limits to a point in the shore line of the Pacific Ocean; thence, northwesterly along said shore line to the point of beginning.

§ 46~~Q~~ Zone two

Section 4. Zone Two shall comprise all that territory and area included within the following described boundaries:

Beginning at a point on the shore line of the Pacific Ocean common to the Rancho Colonia, as per map recorded at Page 14 of Book 3, miscellaneous records (maps) of Ventura County and Rancho Guadalupe as per map recorded at Page 160 of Book 1 of Patents, records of Ventura County; thence northeasterly along the line common to said Ranchos to the center line of Wood Road; thence, north along the center line of said road to northerly line of said Rancho Colonia; thence, westerly along said northerly line of Rancho Colonia to the corner common to the said Rancho Colonia, Rancho Santa Clara Del Norte, as per map recorded at Page 26, Book 3, miscellaneous records, (maps) of Ventura County and Rancho Las Posas, as per map recorded at Page 22 of Book 3, miscellaneous records, (maps) of Ventura County; thence, northeasterly along the line common to said Ranchos Del Norte and Las Posas to the southeasterly corner of lot 43 of the Rancho Del Norte; thence, northwesterly along the southwesterly line of said lot 43 to the corner common to lots 43, 44, 51, and 52 of said Rancho Del Norte; thence, northeasterly along the easterly line of lots 52, 53, and 54 of said Rancho Del Norte to the northeast corner of said lot 54; thence, northwesterly along the northeasterly line of lots 54, and 58, and the northwesterly prolongation thereof to the northwesterly line of Santa Clara Avenue; thence, northeasterly along the northwesterly line of Santa Clara Avenue; and the northeasterly prolongation thereof to the northeasterly line of Los Angeles Avenue; thence, northwesterly along the northeasterly line of said Los Angeles Avenue to the line common to lots 15 and 16 of said Rancho Del Norte; thence, northeasterly along the line common to the said lots 15 and 16 to the northeasterly corner of lot 15; thence, northwesterly along the northeasterly line of lots 15, 14, and 13, of said Rancho to the northwest corner of said lot 13; thence, in a direct line to the corner common to Rancho Del Norte, Rancho Santa Paula y Saticoy, as per map recorded at Page 290 of Book A miscellaneous records of Ventura County, and fractional township 3 north, range 21 west, San Bernardino Base and Meridian; thence, northeasterly along the line common to Rancho Santa Paula y Saticoy and said fractional township and range to the south line of section 32, said township and range; thence, east along the south line of said section 32 to the southeast corner thereof; thence, north along the east line of said section 32 to the one-quarter corner common to sections 32 and 33 said township and range; thence, east through the center of section 33 to the one-quarter corner common to sections 33 and 34, said township and range; thence, north along the west line of sections 34 and 27 to the northwest corner of section 27, said township and range; thence, east along the north line of sections 27 and 26, said township and range, to the southwest corner of section 24 same township and range; thence, north along the west

line of said section 24 to the one-quarter corner common to sections 23 and 24, said township and range; thence, east through the center of said section 24 to the range line between ranges 21 west and 20 west San Bernardino Meridian; thence, north along said range line to the northwest corner of section 19, township 3 north, range 20 west, San Bernardino Base and Meridian; thence, east along the north line of sections 19 and 20, said township and range to the northeast corner of said section 20; thence, south along the east line of said section 20 to the southeast corner thereof; thence, east along the south line of sections 21 and 22, said township and range, to the one-quarter corner common to sections 22 and 27 of said township and range; thence, north through the center of sections 22 and 15 to the center of section 15, said township and range; thence, east through the center of sections 15 and 14 to the one-quarter corner common to sections 13 and 14 of said township and range; thence, south along the west line of said section 13 to the southwest corner thereof; thence, east along the south line of section 13, said township and range, and the south line of sections 18 and 17 of township 3 north, range 19 west San Bernardino Base and Meridian, to the one-quarter corner common to sections 17 and 20 of said township and range; thence, north through the center of section 17 of said township and range, to the one-quarter corner common to sections 8 and 17; thence, east along the south line of section 8 of said township and range, to the southeast corner thereof; thence, north along the east line of said section 8 to the one-quarter corner common to sections 9 and 10 of said township and range; thence, east through the center of sections 9, 10, and 11 of said township and range, to the northwesterly line of the Rancho Simi, as per map recorded at Page 7 of Book 3, miscellaneous records (maps) of Ventura County; thence, northeasterly along said Rancho line to the west line of section 6, township 3 north, range 18 west, Rancho Simi; thence, south along the west line of said section 6 to the southwest corner thereof; thence, east along the south line of section 6, 5, 4, 3, and 2 to the southeast corner of section 2, said township and range, Rancho Simi; thence, south along the east line of section 11, said township and range, to the southeast corner thereof; thence, east along the south line of section 12, said township and range, and the south line of section 7, township 3 north, range 17 west, Rancho Simi, to the southeast corner of said section 7; thence, north along the east line of said section 7 to the one-quarter corner common to sections 7 and 8 of said township and range; thence, east through the center of sections 8 and 9 of said township and range, to the line common to Ventura and Los Angeles Counties; thence, northwesterly along the line common to Ventura and Los Angeles Counties to the north line of section 15, township 8 north, range 19 west, San Bernardino Base & Meridian; thence, west along the north line of sections 15, 16, 17, and 18, of said township and range, and along the north line of section 13, township 8 north, range 20 west, San Bernardino Base & Meridian, to the northwest corner of said section 13; thence, south along the line common to sections 13 and 14, of said township and range, to the southeast corner of said section 14; thence, west along the south line of sections 14, 15, and 16, said township and range to the southwest corner of section 16; thence, north along the west line of said section

16 to the one-quarter corner common to sections 16 and 17 of said township and range; thence, west through the center of sections 17 and 18 of said township and range, to the

center of said section 18; thence, north through the center of said section 18 to the one-quarter corner common to sections 7 and 18 of said township and range; thence, west along the south line of said section 7, said township and range, and sections 12 and 11 of township 8 north, range 21 west, San Bernardino Base & Meridian, to the southwest corner of said section 11; thence, north along the west line of sections 11 and 2 of said township and range, to the line common to Ventura and Kern Counties; thence, west along the line common to said counties, to the east line of section 2, township 8 north, range 22 west, San Bernardino Base & Meridian; thence, south along the east line of said section 2 to the southeast corner thereof; thence, west along the south line of said section 2 to the one-quarter corner common to sections 2 and 11 of said township and range; thence, south through the center of sections 11, 14 and 23, to the one-quarter corner common to sections 23 and 26 of said township and range; thence, east along the south line of sections 23 and 24 of said township and range to the one-quarter corner common to sections 24 and 25 of said township and range; thence, south through the center of said section 25, to the one-quarter corner common to sections 25 and 36 of said township and range; thence, east along the north line of section 36, of said township and range and the north line of section 31, township 8 north, range 21 west, San Bernardino Base & Meridian, to the northeast corner of said section 31; thence, south along the east line of said section 31, and the east line of sections 6 and 7 of township 7 north, range 21 west, San Bernardino Base and Meridian to the southeast corner of said section 7; thence, west along the south line of said section 7 to the one-quarter corner common to sections 7 and 18 of said township and range; thence, south through the center of sections 18 and 19 of said township and range, to the one-quarter corner common to sections 19 and 30 of said township and range; thence, west along the north line of said section 30, and the north line of section 25, township 7 north, range 22 west, San Bernardino Base & Meridian, to the northwest corner of said section 25; thence, south along the west line of said section 25, to the southwest corner thereof; thence, west along the north line of section 35 of said township and range to the northwest corner thereof; thence, south along the west line of said section 35 to the one-quarter corner common to sections 34 and 35 of said township and range; thence, west through the center of said section 34 of said township to the one-quarter corner common to sections 33 and 34 of said township and range; thence, south along the east line of said section 33 and the east line of section 4, township 6 north, range 22 west, San Bernardino Base & Meridian, to the one-quarter corner common to sections 3 and 4 of said township and range; thence, west through the center of section 4, of said township to the one-quarter corner common to sections 4 and 5 of said township and range; thence, south along the east line of said section 5, to the southeast corner thereof; thence, west along the south line of said section 5 to the one-quarter corner common to sections 5 and 8 of said township and range; thence, south through the center of said section 8, to the one-quarter corner common to sections 8 and 17 of said township and range; thence, west along the south line of sections 8 and 7 of said township and range, to the range line common to ranges 22 west and 23 west, San Bernardino; thence, north along said range line, to the east one-quarter corner of section 12, township 6 north, range 23 west, San Bernardino Base

& Meridian; thence, west through the center of said section 12 to the one-quarter corner common to sections 12 and 11 of said township and range; thence, north along the east line of said section 11, to the northeast corner of said section 11; thence, west along the north line of sections 11, 10, 9, and 8 of said township and range to the corner common to sections 5, 6, 7 and 8 thereof; thence, north along the east line of section 6 of said township and range, to the line common to townships 6 north and 7 north, San Bernardino Base; thence, west along said township line to the northeast corner of section 2, township 6 north, range 24 west; San Bernardino Base & Meridian; thence, south along the east line of said section 2 to the one-quarter corner common to sections 1 and 2 of said township and range; thence, west through the center of sections 2 and 3 of said township and range to the one-quarter corner common to sections 3 and 4 of said township and range; thence, south along the east line of said section 4, to the southeast corner thereof; thence, west along the south line of sections 4 and 5 of said township and range, to the line common to Ventura and Santa Barbara Counties; thence, south along the line common to said Counties to the north line of section 29, township 6 north, range 24 west San Bernardino Base & Meridian; thence, east along the north line of sections 29 and 28 of said township and range to the northeast corner of section 28; thence, south along the east line of said section 28 to the one-quarter corner common to sections 27 and 28 of said township and range; thence, east through the center of sections 27 and 26, said township and range, to the one-quarter corner common to sections 26 and 25; thence, south along the west line of said section 25 to the southwest corner thereof; thence, east along the south line of said section 25, and the south line of section 30, township 6 north, range 23 west, San Bernardino Base & Meridian, to the northeast corner of section 31; thence, south along the east line of said section 31 to the township line between township 6 north and 5 north, San Bernardino Base & Meridian; thence, east along said township line to the northwest corner of section 6, township 5 north, range 23 west, San Bernardino Base; thence, south along the west line of said section 6 to the northwest corner of the south half of said section 6; thence, east along the north line of the south half of sections 6, 5, 4, 3, 2, and 1 of said township and range, to the range line between ranges 23 west and 22 west San Bernardino Meridian; thence, south along the west line of section 6, township 5 north, range 22 west San Bernardino Base & Meridian, to the southwest corner of said section; thence, east along the south line of said section 6, to the one-quarter corner common to sections 6 and 7 of said township and range; thence, south through the center of said section 7, to the one-quarter corner common to sections 7 and 18 of said township and range; thence, east along the south line of sections 7, 8, 9, and 10, to the one-quarter corner common to sections 10 and 15 of the said township and range; thence, south through the center of sections 15 and 22 to the center of section 22, said township and range; thence, east through the center of sections 22 and 23 to the one-quarter corner common to sections 23 and 24, of said township and range; thence, south along the east line of sections 23, 26 and 35 of said township and range, and the east line of sections 2 and 11 of township 4 north, range 22 west San Bernardino Base & Meridian to the north line of Rancho Ojai, as per map recorded at page 25 1/2 of Book 5 miscellaneous records (maps) of Ventura County; thence, easterly along the north line of

the Rancho Ojai to the line common to tracts 35 and 36 of said Rancho; thence, south along the line common to tracts 35 and 36 of said Rancho to the line common to the Rancho Ojai and fractional township 4 north, range 22 west, San Bernardino Base & Meridian; thence, westerly along said boundary line to the northwest corner of section 21 of township 4 north, range 22 west San Bernardino Base & Meridian; thence, south along the west line of said section 21 to the north line of the Aliso tract of the Rancho Ex~~M~~ission as per map of said Aliso tract, recorded at page 9 of Book 3, miscellaneous records (maps), of Ventura County; thence, west along the northerly boundary of said Aliso tract, to the northwest corner of lot 5 of subdivision G of said tract; thence, south along the west line of subdivisions G and E of said Aliso tract to the southwest corner of said subdivision E, same being in the north line of fractional township 3 north, range 22 west, San Bernardino Base & Meridian; thence, west along the north line of said fractional township to the northwest corner of fractional section 8 of said township and range; thence, south along the west line of fractional section 8 to the southwest corner of said section; thence, west along the north line of section 18 of said township and range to the northeast corner of lot 1 of said section 18; thence, south along the east line of lots 1, 2, 3, and 4 of said section 18, and east line of lots 2 and 3 of section 19, said township and range, to the south line of said section 19; thence, easterly along the south line of said section 19 to the northeast corner of the Mariano Rancho as per map recorded at page 34, Book 5, miscellaneous records (maps), of Ventura County; thence, southerly along the easterly line of the said Mariano Rancho to the southeast corner of lot 8 of said Rancho; thence, south 4° 30' east, 1,566.4 feet more or less to the south line of the Rancho Ex~~M~~ission as per map recorded at page 103 of Book 2, miscellaneous records, of Ventura County; thence southwesterly along the south line of the Rancho Ex~~M~~ission to the easterly limits of the City of Ventura; thence, southeasterly along the said City limits, same being the westerly line of lots D and M, of the Eells tract as per map recorded at Page 14, Book 1 of County Surveyor's records and the southerly prolongation of said line of the southerly line of Telegraph Road; thence, westerly along the southerly line of Telegraph Road to the intersection with the northeasterly line of Ventura Boulevard, also known as U.S. Highway #101; thence south 39° 0' west along said Ventura city limits, a distance of 3,924.31 feet more or less to the "bluff line"; thence, northwesterly along said "bluff line" to an angle point in said City limits; thence, south 58° 30' west along said Ventura city limits to a point in the shore line of the Pacific Ocean; thence, southeasterly with the shore line of the Pacific Ocean to the point of beginning.

§ 46~~C~~ Zone three

Section 5. Zone Three shall comprise all that territory and area included within the following described boundaries:

Beginning at a point on the shore line of the Pacific Ocean common to the Rancho Colonia, as per map recorded at Page 14 of Book 3, miscellaneous records, (maps) of Ventura County and Rancho Guadalupe as per map recorded at Page 160 of Book 1 of Patents, records of Ventura County; thence, northeasterly along the line common to said

Ranchos to the center line of Wood Road; thence, north along the center line of said road to northerly line of said Rancho Colonia; thence, westerly along said northerly line of Rancho Colonia to the corner common to the said Rancho Colonia, Rancho Santa Clara Del Norte, as per map recorded at Page 26, Book 3, miscellaneous records, (maps) of Ventura County and Rancho Las Posas, as per map recorded at Page 22 of Book 3, miscellaneous records, (maps) of Ventura County; thence, northeasterly along the line common to said Rancho Del Norte and Las Posas to the southeasterly corner of lot 43 of the Rancho Del Norte; thence, northwesterly along the southwesterly line of said lot 43 to the corner common to lots 43, 44, 51, and 52 of said Rancho Del Norte; thence, northeasterly along the easterly line of lots 52, 53, and 54 of said Rancho Del Norte to the northeast corner of said lot 54; thence, northwesterly along the northeasterly line of lots 54, and 58, and the northwesterly prolongation thereof to the northwesterly line of Santa Clara Avenue; thence, northeasterly along the northwesterly line of Santa Clara Avenue and the northeasterly prolongation thereof to the northeasterly line of Los Angeles Avenue; thence, northwesterly along the northeasterly line of said Los Angeles Avenue to the line common to lots 15 and 16 of said Rancho Del Norte; thence, northeasterly along the line common to the said lots 15 and 16 to the northeasterly corner of lot 15; thence, northwesterly along the northeasterly line of lots 15, 14 and 13, of said Rancho to the northwest corner of said lot 13; thence, in a direct line to the corner common to Rancho Del Norte, Rancho Santa Paula y Saticoy, as per map recorded at Page 290 of Book A miscellaneous records of Ventura County, and fractional township 3 north, range 21 west, San Bernardino Base & Meridian; thence, northeasterly along the line common to Rancho Santa Paula y Saticoy and said fractional township and range to the south line of section 32, said township and range; thence, east along the south line of said section 32 to the southeast corner thereof; thence, north along the east line of said section 32 to the one-quarter corner common to sections 32 and 33 said township and range; thence, east through the center of section 33 to the one-quarter corner common to sections 33 and 34, said township and range; thence, north along the west line of sections 34 and 27 to the northwest corner of section 27, said township and range; thence, east along the north line of sections 27 and 26, said township and range, to the southwest corner of section 24 same township and range; thence, north along the west line of said section 24 to the one-quarter corner common to sections 23 and 24, said township and range; thence, east through the center of said section 24 to the range line between ranges 21 west and 20 west San Bernardino Meridian; thence, north along said range line to the northwest corner of section 19, township 3 north, range 20 west, San Bernardino Base & Meridian; thence, east along the north line of sections 19 and 20, said township and range to the northeast corner of said section 20; thence, south along the east line of said section 20 to the southeast corner thereof; thence, east along the south line of sections 21 and 22, said township and range, to the one-quarter corner common to sections 22 and 27 of said township and range; thence, north through the center of sections 22 and 15 to the center of section 15, said township; thence, east through the center of sections 15 and 14 to the one-quarter corner common to sections 13 and 14 of said township and range; thence, south along the west line of said section 13 to the southwest corner

thereof; thence, east along the south line of section 13, said township and range, and the south line of sections 18 and 17 of township 3 north, range 19 west San Bernardino Base & Meridian, to the one-quarter corner common to sections 17 and 20 of said township and range; thence, north through the center of section 17 of said township and range, to the one-quarter corner common to sections 8 and 17; thence, east along the south line of section 8 of said township and range, to the southeast corner thereof; thence, north along the east line of said section 8 to the one-quarter corner common to sections 9 and 10 of said township and range; thence, east through the center of sections 9, 10, and 11 of said township and range, to the northwesterly line of the Rancho Simi, as per map recorded at Page 7 of Book 3, miscellaneous records (maps) of Ventura County; thence, northeasterly along said Rancho line to the west line of section 6, township 3 north, range 18 west, Rancho Simi; thence, south along the west line of said section 6 to the southwest corner thereof; thence, east along the south line of sections 6, 5, 4, 3, and 2 to the southeast corner of section 2, said township and range, Rancho Simi; thence, south along the east line of section 11, said township and range, to the southeast corner thereof; thence, east along the south line of section 12, said township and range, and the south line of section 7, township 3 north, range 17 west, Rancho Simi, to the southeast corner of said section 7; thence, north along the east line of said section 7 to the one-quarter corner common to sections 7 and 8 of said township and range; thence, east through the center of sections 8 and 9 of said township and range, to the line common to Ventura and Los Angeles Counties; thence, southeasterly along the line common to said counties, to the center line of Mesa Drive, as per map of Santa Susana Park #1, recorded at Page 11 of Book 15, miscellaneous records (maps) of Ventura County; thence, southwesterly along the center line of Mesa Drive of Santa Susana Park #1 and Santa Susana Park #3, as per map recorded at Page 1 of Book 17, miscellaneous records (maps) of Ventura County, to the center line of Second Street of said Santa Susana Park #3; thence, northwesterly along the center line of Second Street of said Santa Susana Park #3 to the intersection with the northeasterly prolongation of the line common to lots 84 and 85 of said subdivision; thence, southwesterly along the northeasterly prolongation of and the line common to lots 84 and 85 to the corner common to lots 84, 85 and 114 of said Santa Susana Park #3; thence, north 60° 05' west with the boundary of Santa Susana Park #3 to the intersection of said boundary with a line running east and west through the center of section 15, township 2 north, range 17 west, Rancho Simi; thence, west through the center of said section 15 to the one-quarter corner common to sections 15 and 16 of said township and range, Rancho Simi; thence, south along the east line of section 16 to the southeast corner thereof; thence, west along the south line of said section 16 to the east line of subdivision A of the Rancho Simi; thence, south along the east line of said subdivision A to the southeast corner thereof; thence, west and southwest along the southerly line of subdivisions A, B and C to the corner common to subdivisions C, D and P of said Rancho, same being a corner common to the Rancho Conejo, as per map recorded at Page 746 of Book 1 of Deeds, Records of Ventura County, and Rancho Simi; thence, southerly along the easterly line of the Rancho Conejo to the north line of section 5 of township 2 north, range 18 west, Rancho Conejo; thence, west along the north line

of sections 5 and 6 of said township and range to the north one-quarter corner of said section 6; thence, south through the center of said section 6 to the one-quarter corner common to sections 6 and 7 of said township and range; thence, west along the north line of said section 7 to the corner common to said sections 6 and 7, and sections 1 and 12, township 2 north, range 19 west, Rancho Conejo; thence, south along the east line of sections 12 and 13 of said township and range, to the southeast corner of said section 13; thence, west along the south line of sections 13, 14, 15, 16, 17 and 18 of said township and range, and the south line of section 13, township 2 north, range 20 west, Rancho Conejo, to the one-quarter corner common to sections 13 and 24 of said township and range; thence, south through the center of said section 24, to the one-quarter corner common to sections 24 and 25 of said township and range; thence, west along the south line of sections 24, 23, and 22 of said township and range to the west line of the Rancho Conejo, same being the east line of the Rancho Guadalupe hereinbefore referred to; thence, southerly along the easterly line of the Rancho Guadalupe to the southeast corner of lot 7 of the Broome Estate Ranch, as partitioned by order of the Superior Court of Ventura County, State of California, Case #5181, records of said court; thence, south 89° 53' west 14,969.44 feet along the south line of said lot to an angle point therein; thence, southwesterly in a direct line to an angle point in the line common to lots 5 and 6 of said Broome Estate Ranch at the northwesterly terminus of that course described as north 41° 09' west 17,213.62 feet; thence, southwesterly in a direct line to an angle point in the line common to lots 4 and 5 of said Broome Estate Ranch at the northerly terminus of that course described as north 15° 08' west 6,107.47 feet in said partition; thence, south 59° 52' west 5,280 feet; thence, south 15° 08' east to a point in the shore line of the Pacific Ocean; thence, northwesterly along the shore line of the Pacific Ocean to the point of beginning.

§ 46C Zone four

Section 6. Zone Four shall comprise all that territory and area as provided in Section 1 hereof not included in Sections 3, 4, and 5.

§ 46C.1 Special zones; hearing; notice; protests; concurrence of included cities

Section 6.1. The Board of Supervisors (board) is authorized and empowered at any time and from time to time to create within any of the zones described in Sections 3 to 6, inclusive, of this act, special zones for the purposes of acquiring, engineering, designing, constructing, reconstructing, maintaining, or operating any project authorized by this act or any flood control or storm drainage facilities within such special zones which, in the opinion of the board, will be of special benefit to the area within the special zones. Before creating any special zone under the provisions of this section, the board shall hold a public hearing on the proposal. Notice of the hearing shall be published in a newspaper of general circulation within the proposed special zone, or, if there be one, otherwise notice of the meeting shall be posted in at least seven places within the proposed special zone. Said notice shall describe the boundaries of the proposed special zone and contain a general statement of the nature of the work proposed to be done. At the hearing, any

interested person may appear and protest the creation of the special zone or the performance of any proposed work therein. Before final action is taken to form any special zone, the exterior boundaries of which will include any land lying within the limits of any incorporated city, the board shall have the concurrence of such city to the formation of such special zone, such concurrence to be evidenced by a resolution or ordinance adopted by a majority of the members of the governing body of such city, or by a vote of a majority of the qualified electors residing in such city or portion thereof to be included in such special zone. Said election shall in all particulars be held as provided by law for holding municipal elections in said city, and the cost thereof shall be a city charge.

§ 46C.2 Law governing special zones; powers and duties; taxes and assessments

Section 6.2. All of the provisions of this act relating to zones are applicable to special zones formed under Section 6.1 of this act and all of the powers and duties conferred or imposed by this act with respect to zones, including the powers and duties to levy and collect taxes or assessments, and to incur indebtedness and to issue and sell bonds, shall apply with like respect to special zones, provided that, whenever an indebtedness or bonded indebtedness is incurred in any special zone, the interest on and the principal of such indebtedness or bonded indebtedness may be paid for out of zone wide funds or taxes or assessments derived from within the area of such special zone, to the extent available. It is hereby declared that for the purposes of any tax or assessment levied under subdivision 2 of Section 12 of this act in any special zone, the property so taxed or assessed is equally benefited.

§ 46C.3 Annexation to or withdrawal from special zone

Section 6.3. The board of supervisors is authorized and empowered at any time and from time to time to annex or withdraw territory from a special zone after payment of all debts of said zone. Annexation to, or withdrawal of territory from, a special zone, or termination after payment of all debts of a special zone, may be accomplished on order of the board after notice and public hearing before the board and findings by the board as hereinafter indicated. In the case of a proposed annexation of territory to a special zone, notice of the hearing shall be published in a newspaper of general circulation within the territory proposed to be included within said special zone, if there be one, otherwise, notice of the meeting shall be posted in at least seven places within the territory proposed to be included within said special zone. In the case of a proposed withdrawal of territory from or termination of a special zone, notice of the hearing shall be published in a newspaper of general circulation within said special zone, if there be one, otherwise notice of the meeting shall be posted in at least seven places within said special zone. Said notice shall describe the boundaries of the existing special zone and the boundaries of the territory proposed to be annexed or withdrawn from said zone, as the case may be, and shall contain a general statement of the nature of the work proposed to be done. At the hearing, any interested party may appear and protest the proposed change. In the case of a proposed annexation, if, in the opinion of the board, the territory proposed to be annexed will receive a special benefit from annexing to a special zone, the board shall

enter its order annexing such territory to said zone. In the case of a proposed withdrawal or termination, if, in the opinion of the board, the territory proposed to be withdrawn will receive no special benefit from remaining in the special zone or the land included within a special zone has no outstanding debts and will receive no special benefit from continuation of the zone, as the case may be, the board shall enter its order withdrawing such territory from the special zone or terminating the special zone as the case may be. Any territory annexed to a special zone shall be liable for payment of principal and interest and any other amounts which shall become due on account of any outstanding, or then authorized but thereafter issued, bonds or any thereafter authorized or incurred contractual or other obligations or expenses of said special zone and shall be subject to the levying or fixing and collection of any special zone taxes or assessments or fees or charges or all of them, including but not limited to, taxes or assessments pursuant to Section 6.2 and 19 of this act for payment of principal and interest on any bonded indebtedness of the special zone as may be necessary to provide for such payment. Any territory withdrawn from a special zone shall remain liable for payment of principal and interest on any outstanding or then authorized and issued bonds of the special zone and discharge of contractual or other obligations or expenses existing or authorized prior to such withdrawal and shall be subject to the levying or fixing and collection of any special zone taxes or assessments or fees or charges or all of them, including, but not limited to, taxes or assessments pursuant to Sections 6.2 and 19 of this act for payment of principal and interest on any bonded indebtedness of the special zone as may be necessary to provide for such payment. All assets of a special zone which is terminated shall be paid to the general fund of, and belong to, the zone within which the terminated special zone shall have been situated.

§ 46Ö Objects and purposes; nature of district; powers

Section 7. The objects and purposes of this act are to:

- a. provide for the control of the flood and storm waters of said district, and the flood and storm waters of streams that have their source outside of said district, but which streams and the flood waters thereof flow into said district;
- b. to conserve such waters for beneficial and useful purposes by spreading, storing, retaining and causing to percolate into the soil within said district, or without such district, such waters;
- c. to save or conserve in any manner all or any of such waters and protect from such flood or storm waters the watercourses, watersheds, public highways, life and property in said district;
- d. to prevent waste of water or diminution of the water supply in, or exportation of water from said district and to obtain, retain and reclaim drainage, storm, flood and other waters for beneficial use in said district; and
- e. to provide for the protection from erosion of beaches and shorelines within the district and to provide for the restoration of such beaches and shorelines.

Ventura County Watershed Protection Act

Ventura County Watershed Protection District is hereby declared to be a body corporate and politic and, as such, shall have power:

1. To have perpetual succession.
2. To sue and be sued, in the name of said district, in all actions and proceedings, in all courts and tribunals of competent jurisdiction.
3. To adopt a seal and alter it at pleasure.
4. To take by grant, purchase, gift, devise or lease, or otherwise, and to hold, use, enjoy and to lease or dispose of, real or personal property of every kind within or without the district necessary or convenient to the full exercise of its powers.
5. To acquire by purchase, lease, construction, or otherwise, or contract to acquire, lands, right of way, easements, privileges, and property of every kind, whether real or personal, and to construct, maintain, and operate any and all works or improvements within or without the district necessary or proper to carry out any of the objects or purposes of the act, and to complete, extend, add to, repair, or otherwise improve any works, or improvements, or property acquired by it as authorized by this act.
6. To store water in surface or underground reservoirs within or outside of the district for the common benefit of a zone or zones affected. To conserve and reclaim water for present and future use within the district. To appropriate and acquire water and water rights, and import water into the district, and to conserve within or outside of the district, same for any useful purpose to the district. To commence, maintain, intervene in and compromise, in the name of the district, or otherwise, and to assume the costs and expenses of any action or proceeding involving or affecting the ownership or use of waters or water rights within the district used or useful for any purpose of the district, or of common benefit to any land situated therein, or involving the wasteful use of water therein. To commence, maintain, intervene in, defend, and compromise, and to assume the costs and expenses of any and all actions and proceedings now or hereafter begun to prevent interference with or diminution of, or to declare rights in the natural flow of any stream or surface or subterranean supply of waters used or useful for any purpose of the district or of common benefit to the lands within the district or to its inhabitants. To prevent unlawful exportation of water from said district. To prevent contamination, pollution or otherwise rendering unfit for beneficial use the surface or subsurface water used in said district; and to commence, maintain, and defend actions and proceedings to prevent any such interference with the aforesaid waters as may endanger or damage the inhabitants, lands, or use of water in the district. However, that said, the district shall not have power to intervene or take part in, or to pay the costs or expenses of, actions or controversies between the owners of lands or water rights within the boundaries of the district and which do not involve taking water outside of or away from the district or wasteful use of water.
7. To control the flood and storm waters of said district and the flood and storm waters of streams that have their source outside of said district, but which streams and the flood waters thereof, flow into said district, and to conserve such waters for

beneficial and useful purposes within said district by spreading, storing, retaining, and causing to percolate into the soil within or without said district, or to save or conserve in any manner all or any of such waters, and protect from damage from such flood or storm waters the watercourses, watersheds, public highways, life, and property in said district.

8. To exercise the right of eminent domain, either within or without said district, to take any property necessary to carry out any of the objects or purposes of this act. Nothing in this act contained shall be deemed to authorize said district, or any person or persons to divert the waters of any river, creek, stream, irrigation system, canal or ditch, from its channel, to the detriment of any person, or persons having any interest in such river, creek, stream, irrigation system, canal or ditch, or the waters thereof or therein, unless previous compensation be first ascertained and paid therefor, under the laws of this state authorizing the taking of private property for public uses.
9. To enter upon any land, to make surveys, and locate the necessary works of improvement and the lines for channels, conduits, canals, pipelines, roadways, and other rights of way. To acquire by purchase, lease, contract, gift, or other legal means all lands, water and water rights, and other property necessary or convenient for the construction, use, supply, maintenance, repair, and improvement of said works, including works constructed and being constructed by private owners, lands for reservoirs for storage of necessary water, and all necessary appurtenances; and also, where necessary or convenient to said end, and for said purposes and uses, to acquire and hold the stock of corporations, domestic or foreign, owning water or water rights, canals, waterworks, franchises, concessions or rights. To enter into and do anything necessary or proper for the performance of any agreement with the United States, or any state, county, district of any kind, public or private corporation, association, firm, or individual, or any number of them, for the joint acquisition, construction, leasing, ownership, disposition, use, management, maintenance, repair, or operation of any rights, works, or other property of a kind which might be lawfully acquired or owned by the Watershed Protection District. To acquire the right to store water in any reservoirs, or to carry water through any canal, ditch, or conduit not owned or controlled by the district. To grant to any owner or lessee the right to the use of any water or right to store such water in any reservoir of the district, or to carry such water through any tunnel, canal, ditch, or conduit of the district. To enter into and do acts necessary or proper for the performance of any agreement with any district of any kind, public or private corporation, association, firm, or individual, or any number of them, for the transfer, sale, or delivery to any such district, corporation, association, firm, or individual of any water right or water pumped, stored, appropriated, or otherwise acquired or secured for the use of the District or any zone thereof, or for the purpose of exchanging the same for other water, water right, or water supply in exchange for water, water right, or water supply to be delivered to said district by the other party to said agreement. To cooperate with,

and to act in conjunction with the State of California, or any of its engineers, officers, boards, commissions, departments or agencies, or with the Government of the United States, or any of its engineers, officers, boards, commissions, departments or agencies, or with any public or private corporation, in the construction of any work for the controlling of flood or storm waters of said district, or for the protection of life or property therein, or for the purpose of conserving said waters for beneficial use within said district, or in any other works, acts, or purposes provided for herein, and to adopt and carry out any definite plan or system of work for any such purpose.

10. To carry on technical and other investigations or all kinds, make measurements, collect data, and make analyses, studies, and inspections pertaining to water supply, water rights, control of floods, and use of water, both within and without said district; and for this purpose, said district shall have the right of access through its authorized representative to all properties within said district.
11. To incur indebtedness and to issue bonds in the manner herein provided.
12. To cause taxes and assessments to be levied and collected for the purpose of paying any obligation of the district, and to carry out any of the purposes of this act, in the manner hereinafter provided.
13. To make contracts, and to employ labor, and to do all acts necessary for the full exercise of all powers vested in said district, or any of the officers thereof, by this act.
14. To cooperate and to act in conjunction with, or to contribute funds to, the United States or the state for the purposes of protecting beaches or shorelines within the district, or restoring such beaches or shorelines.
15. To carry on technical investigations pertaining to ocean currents, tides, erosion, soundings and beach surveys.

§ 46.1 Land development fees; amounts; use of revenues

Section 7.1.

(a) In addition to the powers listed in Section 7, the district shall have the power by ordinance or resolution to prescribe, revise, and collect fees and charges in any zone and in any special zone as a condition of development of land. Land to be developed within a special zone shall be subject to both the fees and charges of the zone in which it is located and the fees and charges of the special zone in which it is located. Development of land for the purposes of this section shall include, but not be limited to, subdivision; development as governed by the Subdivision Map Act; construction of new buildings, structures and improvements for residential, commercial, or industrial purposes; and any development of land requiring either zone variance or special use permit.

(b)

(1) The amount of fees and charges levied for each zone and for each special zone shall be determined separately and shall be based on the need created by development of land for flood control facilities within the zone or special zone.

(2) The amount of fees and charges levied for any zone, other than a special zone, shall not exceed two thousand four hundred dollars (\$2,400) for each acre or portion thereof of land to be developed. The district, by ordinance or resolution, may annually adjust the maximum amount of the fees and charges for each acre or portion thereof of land to be developed in a zone based upon a recognized cost index. An ordinance or resolution adjusting the maximum amount of the fees and charges in a zone shall become operative upon approval of two-thirds of the electors voting on the proposition in the zone.

(3) Fees and charges prescribed as a condition of development of land pursuant to this section shall be in addition to any other conditions imposed on the development by any other agency having power to prescribe such other conditions.

(c) Except as hereinafter provided, revenues derived from fees and charges prescribed for any zone may be used only for the acquisition, engineering, design, construction, reconstruction, maintenance, or operation of flood control or storm drainage facilities within that zone, or within any special zone located in that zone, or be used to pay the interest on or reduce the principal of any bonded indebtedness of that zone. At the discretion of the board of supervisors, all or part of the fees and charges prescribed for any zone which are collected as a condition of development of land located within a special zone may be used to pay the interest on, or reduce the principal of, any bonded indebtedness of that special zone.

(d) Except as hereinafter provided, revenues derived from fees and charges prescribed for any special zone may be used only for the acquisition, engineering, design, construction, reconstruction, maintenance, or operation of flood control or storm drainage facilities within that special zone or used to pay the interest on, or reduce the principal of, any bonded indebtedness of that zone.

(e) Whenever the development of land within any zone or within any special zone is made subject to fees or charges by the board of supervisors pursuant to this section, the board of supervisors may allow a credit against those fees for the acquisition, engineering, design, construction, reconstruction, maintenance, or operation costs of any flood control or storm drainage facility within the zone or special zone which has been constructed or paid for in connection with the development of land within that zone or special zone.

(f) The board of supervisors may also reduce fees or charges prescribed for any part of the land to be developed within the zone or special zone if it finds that, because of special circumstances, the payment thereof would be inequitable or would cause undue hardship, and the reduction of the fees would be in the public interest.

(g) The consent and approval of the legislative body of a city shall be necessary before any fees or charges may be levied on the development of land located within the

corporate boundaries of a city which are higher than any fees or charges levied on the development of land located outside the corporate boundaries of that city.

§ 46.3 Nuisance Abatement

Section 7.3. In addition to other provisions specified in this act, the district may exercise the authority granted to a county pursuant to Section 25845 of the Government Code for the purpose of abating a nuisance. For the purposes of carrying out this section, a reference to the “county” in Section 25845 of the Government Code means the district. An abatement lien that is created pursuant to this section is subject to subdivisions (e), (f), and (g) of Section 25845 of the Government Code and shall have no greater priority than a lien created pursuant to that section.

§ 46.5 Additional powers; financing zone projects; procedure; tax liens

Section 7.5.

a) In addition to the powers specified in Section 7, the district shall have the power to borrow money to finance any flood control or conservation project of any zone of the district. In Zone 1, the loans shall not exceed one percent of the total assessed valuation of the zone. In Zones 2, 3, and 4, the loans shall not exceed two percent of the assessed valuation of the respective zones. In special zones, the loans shall not exceed five percent of the assessed valuation of the special zone. Any loan shall be repaid in installments over a period not to exceed the term approved at the special election required by this section. The loan shall constitute a charge against the funds of the zone in which the construction occurs. Pursuant to the powers herein granted, the board of supervisors may borrow money from the United States of America, or any agency or department thereof, or from the State of California or any agency or department thereof, or from any bank or banking institution authorized to transact business within the State of California, or from any private corporation organized under the laws of the State of California and authorized by its articles of incorporation to lend money to public agencies for construction of public works. The power to borrow money authorized by this section shall be exercised only when both of the following actions have been taken:

1. The board of supervisors has declared the existence of an emergency and ordered holding of a special election not less than 30 days from the date of the resolution declaring the existence of an emergency, or the board of supervisors has formed a special zone pursuant to Section 6.1 and ordered the holding of a special election not less than 30 days from the date of the resolution forming the special zone.
2. The proposition of borrowing money has been ratified and authorized by two-thirds of the votes cast at a special election called for the purpose. A special election may be consolidated with a primary or general election.

b) Interest on any loan shall not exceed the rate permitted under Article 7 (commencing with Section 53530) of Chapter 3 of Part 1 of Division 2 of Title 5 of the Government Code. A loan made pursuant to this act shall be evidenced by a written contract signed by the chair of the board specifying the particular flood control work or projects for which the

contracts shall be let. If a surplus remains after completion of the work, the surplus shall be applied to the payment of the principal and interest due under the contract. The board of supervisors shall annually levy a tax upon the taxable property of the zone or zones within which the work is performed, sufficient to pay the installments and interest on the loan as the same shall become due and payable in accordance with the terms of the contract, except that the tax levy for the payment of principal and interest on any loan shall not, together with all other charges and obligations for construction, maintenance, operation and improvements within the zone, exceed the limitations fixed by Section 12.

c) All tax liens for taxes imposed under this section shall attach annually as of noon on the first Monday in March proceeding the fiscal year for which the taxes are levied.

§ 46.7 Notes; limitation; purposes; payment

Section 7.7. In addition to the powers specified in Sections 7 and 7.5 of this act, the district shall have the power to issue notes of indebtedness in amounts not exceeding five hundred thousand dollars (\$500,000) to repair or remove flood control structures including dams and appurtenant works which the board of supervisors has determined by four-fifths vote are a danger to life or property. Such notes shall be authorized investments for a local agency as provided in Section 53601 of the Government Code. All such notes may be payable in installments over a period fixed by the board of supervisors and shall be obligations of the district or of any zone thereof. The notes may be issued without an election.

§ 46.8 was repealed by Stats. 1972, c. 416, p. 740, § 1

§ 46.8 Chaptered via AB 561 (Gorell) 8/4/2011

Notwithstanding any other section of this act, and consistent with Section 18 or Article XVI of the California Constitution, the district may do either or both of the following:

- a) Participate in state or federal revolving loan programs for the purposes enumerated in Section 7.
- b) Issue securitized limited obligation notes pursuant to Article 7.4 (commencing with Section 53835 of Chapter 4 of Part 1 of Division 2 of Title 5 of the Government Code. Notwithstanding subdivision (e) of Section 53838 of the Government Code, the total amount of limited obligation notes outstanding at any one time for all zones within the district shall not exceed the sum of thirteen million dollars (\$13,000,000).

§ 46.9 Ordinances; purposes

Section 7.9. In addition to the powers specified in Sections 7, 7.5, and 7.7 of this act, the district shall have the power, after holding a public hearing after reasonable notice thereof, to adopt and enforce ordinances within the incorporated and unincorporated areas of the district for the following purposes:

Ventura County Watershed Protection Act

- a) The establishment, protection and regulation of designated floodways in accordance with the provisions of the Cobey-Alquist Flood Management Act (Chapter 4, commencing with Section 8400, Part 2, Division 5 of the Water Code).
- b) The protection and regulation of any flood control, storm water drainage or water conservation facility or right-of-way.
- c) The protection and regulation of any natural or artificial watercourse, including any stream, river, creek, ditch, channel, canal, conduit, culvert, drain, waterway, gully, ravine, arroyo, or wash in which waters flow in a definite direction or course, either continuously or intermittently, and which has a definite channel, bed and banks.
- d) The protection and regulation of any area adjacent to any natural or artificial watercourse which is an area designated by the board of supervisors as subject to inundation or erosion by reason of overflow or flood or storm water.

Violation of any of the provisions of a district ordinance enacted pursuant to this section may be abated as a public nuisance, and the board of supervisors may, by ordinance, establish a procedure for abatement of such a nuisance and assess the cost of any abatement to the violator. If the violator maintains the nuisance upon real property in which he has an interest, the assessment shall be a charge on such real property. The assessment may be collected at the same time and in the same manner as ordinary district taxes are collected, and shall be subject to the same penalties and the same procedure for sale in case of delinquency as provided for ordinary district taxes. All laws applicable to the levy, collection, and enforcement of county taxes shall be applicable to such assessment.

Every person who violates any of the provisions of a district ordinance adopted pursuant to this section is guilty of a misdemeanor.

§ 460.10 Object and purpose of this act; derivation of funds

Section 7.10.

(a) A specific object and purpose of this act is to provide for the recreational use and beautification of lands and properties in connection with the carrying out of, and as a part of, the broader flood control and water conservation objects and purposes of this act, to the end that the scenic beauty and natural environment of such lands is enhanced, protected, and preserved. To carry out such specific object and purpose, the district shall have, in addition to the other powers vested in it by the act, the following powers:

- 1) To acquire, construct, maintain, operate, and install recreational facilities or landscaping within the district, or any zone of the district, in connection with any dam, reservoir, flood control, or storm drainage facility or work of improvement, or other property owned or controlled by the district, or in connection with any flood control or water conservation project in which the district participates in the cost of construction, operation, or maintenance, or in the cost of land acquisition therefor.
- 2) Upon a finding of the board of supervisors that the acquisition is necessary to the full exercise of its power under the provisions of paragraph (1) of this subdivision,

to acquire by grant, purchase, gift, devise, lease, construction, condemnation, or otherwise; and to hold, use, enhance, protect, preserve, manage, occupy, possess, and enjoy any lands or interests in lands contiguous to any property owned or controlled by the district, or contiguous to any flood control or water conservation project in which the district participates in the cost of construction, operation, or maintenance thereof, or in the cost of land acquisition therefor, for recreational use or beautification purposes. It is hereby declared that the use of lands or interests in lands which may be condemned, taken, or appropriated under the provisions of this paragraph is a public use subject to the regulation and control of the state in the manner prescribed by law.

- 3) Upon finding of the board of supervisors that any of the facilities or properties acquired or held by the district pursuant to the provisions of this section are no longer necessary to be retained for the uses and purposes thereof, or upon a finding by the board of supervisors that provision will be made for the continued recreational use or beautification of such facilities or property by others, to provide, by agreement with other public agencies or private persons or entities or otherwise, for the recreational use or beautification of such facilities or properties or for the leasing or disposal of such facilities or properties; provided, however, that no such agreement, lease, or disposal of any such facilities or property shall interfere or be inconsistent with any flood control or water conservation use or purpose of such facilities or properties or contiguous properties owned or controlled by the district.
- 4) To exercise any of the powers vested in it by this act and to do all acts necessary for the full exercise of the powers vested in it by this section.

(b) Funds for exercise of the powers vested in the district by this section may be derived from ad *valorem* taxes or assessments levied pursuant to Section 12 of this act, or fees and charges collected pursuant to Section 7.1 of this act. It is hereby declared that, for the purposes of any tax or assessment levied under Subdivision 2, Section 12 of this act for recreational use or beautification purposes of special benefit to any zone of the district, the property so taxed or assessed is equally benefited. In regard to any flood control, water conservation, or storm drainage facility or work of improvement for which bonds are hereafter voted under the provisions of this act, the proceeds of such bonds may be used for recreational use or beautification purposes authorized by the provisions of this section. However, in connection with any flood control or water conservation project in which the district participates in whole or in part, in no event shall the district expend funds, regardless from what source or sources derived, for the acquisition, construction, or installation of any recreational facilities or landscaping or for the acquisition of lands or interests in lands for recreational or beautification purposes, the total amount of which exceeds 10 percent of the costs of construction of such flood control or water conservation project.

(c) As used in this section, "recreation" means recreational activities associated with the outdoors, such as camping, picnicking, fishing, boating, sightseeing, hiking, and water contact sports and the associated facilities of campgrounds, riding and hiking trails, picnic

areas, parking areas, boat launching ramps, view points, water supply and sanitary facilities, and such other facilities as may be necessary to make project land and water areas available for use by the public.

§ 46C Supervisors; officers, ordinances, resolutions and other legislative acts

Section 8. The board of supervisors of Ventura County shall be, and they are hereby designated as, and empowered to act as, ex officio the board of supervisors of said Ventura County Watershed Protection District, and said board of supervisors is hereby authorized to adopt reasonable rules and regulations to facilitate the exercise of its powers and duties herein set forth. Each member of the board as such ex officio officer shall receive a salary of fifty dollars (\$50) per month payable from the funds of the Ventura County Watershed Protection District in addition to his salary as county supervisor.

The district attorney, county surveyor, county assessor, county tax collector, county auditor and county treasurer of the County of Ventura, and their successors in office, and all their assistants, deputies, clerks and employees, and all other officers of said Ventura County, their assistants, deputies, clerks and employees, shall be ex officio officers, assistants, deputies, clerks and employees respectively of said Ventura County Watershed Protection District, and shall respectively perform, unless otherwise provided by said board of supervisors, the same various duties for said district as for said Ventura County, in order to carry out the provisions of this act; provided, however, that where the county surveyor is a registered civil engineer and is employed by the board of supervisors to supervise the engineering work of said district, the board of supervisors may provide for compensation for his services hereunder, in addition to his salary as county surveyor of Ventura County. Such increase shall be paid from the funds of the Ventura County Watershed Protection District.

In addition to the officers and employees herein otherwise prescribed, said board of supervisors may in their discretion appoint a chairman, a secretary and such other officers, agents and employees for said board or district as in their judgment may be deemed necessary, prescribe their duties and fix their compensation, said officers, agents and employees to hold their respective offices or positions during the pleasure of the board.

All ordinances, resolutions and other legislative acts for said district shall be adopted by said board of supervisors, and certified to, recorded and published, in the same manner, except as herein otherwise expressly provided, as are ordinances, resolutions or other legislative acts for the County of Ventura.

§ 46D Administrative rules and regulations

Section 9. The said board of supervisors of said district shall have power to make and enforce all needful rules and regulations for the administration and government of said district, and to appoint and employ all needful agents, superintendents, engineers, and employees to properly look after the performance of any work provided for in this act and

to operate and maintain said works, and to perform all other acts necessary or proper to accomplish the purposes of this act.

§ 4600 Engineers; investigation of flood control plans; reports; cost estimates; removal

Section 10. Said board of supervisors shall have jurisdiction and power to employ by resolution a competent registered civil engineer or engineers to investigate carefully the best plan or plans to control the flood and storm waters of said district, and the zones thereof, and the flood and storm waters of streams that have their source outside of said district but which stream and the flood waters thereof flow into said district, and to conserve such waters for beneficial and useful purposes by spreading, storing, retaining or causing to percolate into the soil within or without said district, or to save or conserve in any manner, any or all of such waters, and to protect the watercourses, watersheds, public highways, life and property in said district from damage from such waters; and to obtain such other information in regard thereto as may be deemed necessary or useful for carrying out the purposes of this act, and such resolution may direct such engineer or engineers to make and file reports from time to time with said board of supervisors, which shall show:

1. A general description of the work to be done on each project or work of improvement.
2. General plans, profiles, cross sections and general specifications of the work to be done on each project or work of improvement.
3. A general description of the lands, rights of way, easements and property proposed to be taken, acquired or injured in carrying out said work.
4. A map or maps which shall show the location and zone of each of said projects or improvements, and lands, rights of way, easements and property to be taken, acquired or injured in carrying out said work, and any other information in regard to the same that may be deemed necessary or useful.
5. An estimate of the cost of each project or work of improvement, including an estimate of the cost of lands, rights of way, easements and property proposed to be taken, acquired or injured in carrying out said project or work of improvement, and also of all incidental expenses likely to be incurred in connection therewith, including legal, clerical, engineering, superintendence, inspection, printing and advertising, and stating the total amount of bonds, if any, necessary to be issued to pay for the same.

Said engineer or engineers shall from time to time and as directed by the board of supervisors file with said board supplementary, amendatory and additional reports and recommendations, as necessity and convenience may require.

Such engineer or engineers, employed by said resolution, shall have power and authority, subject to the control and direction of said board of supervisors, to employ such

engineers, surveyors, and others, as may be required for making all surveys or doing any other work necessary for the making of such report.

The said board of supervisors may at any time remove any or all of the engineers or employees appointed or employed under this act, and may fill any vacancies occurring among them from any cause.

§ 46Ā1 Property

Section 11. The legal title to all property acquired under the provisions of this act shall immediately and by operation of law vest in said district, and shall be held by said district, in trust for, and is hereby dedicated and set apart to, the uses and purposes set forth in this act. The board of supervisors is hereby authorized and empowered to hold, use, acquire, manage, occupy and possess said property, as herein provided; and said board of supervisors may determine, by resolution duly entered in their minutes that any property, real or personal, held by said district is no longer necessary to be retained for the uses and purposes thereof, and may thereafter sell or otherwise dispose of said property, or lease the same.

§ 46Ā2 Taxes, assessments or fees: levy; limitations; expenditures

Section 12. The board of supervisors of the district shall have power, in any year, to do any of the following:

1. To levy an ad valorem tax on all taxable property, or an assessment on all taxable real property in the district, or a fee imposed pursuant to Article XIII D of the California Constitution, to pay the costs and expenses of the Ventura County Watershed Protection District and to carry out any of the objects or purposes of this act of common benefit to the district as a whole.
2. To levy an ad valorem tax on all taxable property, or an assessment upon all taxable real property, or a fee imposed pursuant to Article XIII D of the California Constitution, in each or any of the zones, according to the benefits derived or to be derived by the respective zones, to pay the cost and expenses of carrying out any of the objects or purposes of this act of special benefit to the respective zones, including the constructing, maintaining, operating, extending, repairing, or otherwise improving any or all works or improvements within the respective zones. It is declared that all property within a given zone is equally benefited under this act.

The taxes, assessments, or fees imposed pursuant to Article XIII D of the California Constitution, shall be levied and collected together with, and not separately from, taxes for county purposes, and the revenues derived from the taxes, assessments or fees shall be paid into the county treasury to the credit of the district. The board of supervisors shall have the power to control and order the expenditure thereof for those purposes, except that no revenues, or portions thereof, derived in any of the several zones from the taxes, assessments, or fees levied under the provisions of subdivision 2 of this section shall be

expended for constructing, maintaining, operating, extending, repairing or otherwise improving any works or improvements located in any other zone except as provided in section 14. The aggregate taxes, assessments, or fees levied under this act for any one fiscal year shall not exceed thirtytwo cents (\$0.32) on each one hundred dollars (\$100) of the assessed valuation of the taxable property in Zone 1, shall not exceed forty cents (\$0.40) on each one hundred dollars (\$100) of the assessed valuation of the taxable property in Zones 2 and 4, shall not exceed twentyseven cents (\$0.27) on each one hundred dollars (\$100) of the assessed valuation of the taxable property in any special zone in addition to the aggregate taxes or assessments levied for Zone 1, 2, 3, or 4 and exclusive of any tax, assessment, or fee levied to pay the cost and expenses of any project or facility for importing water into the district or to meet any bonded indebtedness of the zones or district and the interest on that bonded indebtedness.

The amendment of this section made at the 198788 Regular Session of the Legislature does not constitute a change in, but is declaratory of, the existing law.

(Amended by AB 554, 10/04/05)

§ 462a Taxes or assessments; construction of provisions

Section 12a. The provisions of this act concerning the levy and collection of taxes shall be construed to mean that all proceedings in connection with the preparation and adoption of a budget for the district may be done and taken in conjunction with the preparation and adoption of the budget for the County of Ventura except that the resolution adopting the final budget for the district shall be adopted by the Board of Supervisors of the Ventura County Watershed Protection District. The fixing of the tax or assessment rate of the district, and the levying of any tax or assessment, shall be done by the Board of Supervisors of the County of Ventura in accordance with the provisions of Section 29120 of the Government Code.

§ 462.1 Additional tax in Zone

Section 12.1. In addition to the taxes which may be levied pursuant to Section 12 of this act, the board of supervisors may levy an additional tax in Zone 1 not to exceed five cents (\$0.05) on each one hundred dollars (\$100) of the assessed valuation of the taxable property in Zone 1 for the purpose of financing the repair or removal of Matilija Dam.

§ 462.2 Additional tax on assessment in Zone 3

Section 12.2. In order to carry out the objects and purposes of this act, the board of supervisors of said district shall have the power in any year to levy an ad valorem tax or assessment upon all taxable property in Zone 3, according to the benefits derived or to be derived by said zone, to pay the interest on or reduce the principal of any bonded indebtedness of any protection district established under the Protection District Act of 1907 located within said zone; provided, however, that the aggregate taxes or assessments levied pursuant to this section and Section 12 of this act on the taxable property in Zone 3 for any one fiscal year shall not exceed the amount of taxes or

assessments which may be levied pursuant to Section 12 of this act on the taxable property in Zone 3 for any one fiscal year. Said tax or assessment shall be levied and collected together with, and not separately from, taxes for county purposes, and the revenues from said taxes shall be paid into the county treasury to the credit of said district, and said board of supervisors shall have the power to control and order the expenditure thereof for said purpose. It is hereby declared that all property within said Zone 3 so taxed or assessed is equally benefited under this act.

§ 4602.3 Assessment for flood control and maintaining property value roll or system; utilities; assessment proceedings combined with bond issuance proceedings:

Section 12.3.

(a) The Legislature hereby finds and declares that a county may face substantial expense in maintaining a roll or system which reflects both current values of property for purposes of ad valorem assessments, as well as the property values for general taxation mandated by Article XIII A of the California Constitution. The Legislature further finds and declares that a fair and proper assessment for flood control purposes may be levied according to the benefits derived or to be derived by the real property within a zone, which benefit may be determined on the basis of proportionate storm water runoff from each parcel of real property in a zone.

(b) In addition to, and not in derogation of or limited by, existing authority to levy assessments under section 12 and other provisions of this act, the board may, in any year, levy an assessment on taxable real property in the district based on the benefit which each parcel of real property to be assessed shall derive from the works and improvements to be constructed, maintained, operated, extended, or repaired. The assessments may be imposed and used to finance the maintenance and operation costs of flood control services and the cost of installation and improvement of flood control facilities. The assessments may also be used to pay for the costs of maintaining a roll or system which reflects current values of property for the purposes of ad valorem assessments. For purposes of levying any assessment, the board may establish one or more areas of benefit, including parcels of real property, which benefit similarly from those works and improvements, and may levy different assessments within those areas of benefit. The areas of benefit shall be identified and described in a resolution adopted by the board. In the case of any assessment levied under this act, the benefit may be determined on the basis of proportionate storm water runoff from each parcel of real property. In levying assessments under this act, the board shall be subject to the substantive requirements of Section 54711 of the Government Code and shall employ the procedures provided for in Sections 54715 and 54716 of the Government Code. Whenever a railroad, gas, water, telephone, cable television, electric utility right-of-way, electric line right-of-way, or other utility right-of-way is included in an area proposed to be assessed, the railroad, gas, water, telephone, cable television, electric utility right-of-way, electric line right-of-way, or other utility right-of-way shall be subject to assessment only

if, and to the extent that it is found that it shall benefit from the service. Proceedings for levying assessments under this act may be combined with proceedings for issuance of bonds prescribed in Section 20.2 to 20.12 inclusive, and the proceedings prescribed by those sections may be modified as the board deems necessary to accommodate the combination of proceedings.

§ 46Ċ3 Claims for money or damages; law governing; other claims; procedure

Section 13. Claims for money or damages against the district are governed by Part 3 (commencing with Section 900) and Part 4 (commencing with Section 940) of Division 3.6 of Title 1 of the Government Code, except as provided therein. Claims not governed thereby or by other statutes or by ordinances or regulations authorized by law and expressly applicable to such claims shall be prepared and presented to the governing body, and all claims shall be audited and paid, in the same manner and with the same effect as are similar claims against the county.

§ 46Ċ4 Joint projects

Section 14. The board of supervisors of said district may institute joint projects by contiguous zones for the financing, constructing, maintaining, operating, extending, repairing or otherwise improving any work or improvement located or to be located in either of said zones and of common benefit to said participating zones. For the purpose of acquiring authority to proceed with any such joint project, the board of supervisors shall adopt a resolution specifying its intention to undertake such joint project, together with the engineering estimates of the cost of same and proportionate costs to be borne by the participating zones and fixing a time and place for public hearing of said resolution and which shall refer to a map or maps showing the general location and general construction of said project. Notice of such hearing shall be given by publication once a week for two consecutive weeks prior to said hearing, the last publication of which notice must be at least seven (7) days before said hearing, in a newspaper of general circulation, circulated in each of said participating zones, and if there be no such newspaper, then by posting notice for two consecutive weeks prior to said hearing in five public places in each of said participating zones. Said notice must designate a public place in each of said participating zones where a copy of the map or maps of said joint project may be seen by any interested person; said map must be posted in each of said public places so designated in said notice at least two weeks prior to said hearing.

At the time and place fixed for the hearing, or at any time to which said hearing may be continued, the board of supervisors shall consider all written and oral objections to the proposed joint project. Upon the conclusion of the hearing, the board of supervisors may abandon the proposed joint project or proceed with the same, unless prior to the conclusion of said hearing written protests against the proposed joint project signed by a majority in number of the registered voters residing within either of said zones be filed with the board of supervisors, in which event said project must be abandoned.

§ 4605 Bonds; determination of necessity; election call; irregularities; vote required

Section 15.

(1) Whenever the board of supervisors shall determine that a bonded indebtedness should be incurred to pay the cost of any work of improvement in any zone, the board may by resolution, passed by a four-fifths vote of the board, determine and declare the amount of bonds in order to raise the amount of money necessary for such work of improvement and the maximum rate of interest of said bonds. Such cost of any work of improvement may include the cost of any financial assistance required of the Ventura County Watershed Protection District by any unit of the federal government as a condition to the installation by such unit of the federal government of any channel improvement within the Ventura County Watershed Protection District for which federal or state financial assistance is authorized by the federal or state government. Said work of improvement may be described by reference to the report filed pursuant to Section 10 hereof and no other description shall be necessary. Said board shall cause a copy of said resolution, duly certified by the clerk, to be filed for record in the office of the Recorder of Ventura County within five (5) days after its issuance. From and after said filing the said board shall be deemed vested with the authority to proceed with said bond election.

(2) After the filing for record of the resolution specified in subdivision (1) of this section, the said board of supervisors may call a special election in said zone at which shall be submitted to the qualified electors of said zone the question whether or not bonds shall be issued in the amount determined in said resolution and for the purposes therein stated. Said bonds and the interest thereon shall be paid from revenue derived from annual taxes or assessments levied upon the property taxable by said district situated within the zone, and all such taxable property shall be and remain liable to be taxed for such payments as provided in this act.

(3) Said board of supervisors shall call such special election by ordinance and not otherwise and submit to the qualified electors of said zone the proposition of incurring a bonded debt in said zone in the amount and for the purposes stated in said resolution and shall recite therein the purposes for which the indebtedness is proposed to be incurred; provided, that it shall be sufficient to describe such purposes, by reference to the resolution adopted by said board of supervisors, and on file for particulars; and said ordinances shall also state the estimated cost of the proposed work of improvement, the amount of the principal of the indebtedness to be incurred therefor, and the maximum rate of interest to be paid on said indebtedness, and shall fix the date on which such special election shall be held, and the form and contents of the ballot to be used. The rate of interest to be paid on such indebtedness shall not exceed seven percent (7%) per annum. For the purposes of said election, said board of supervisors shall in said ordinance establish election precincts within the boundaries of the said zone and may form election precincts by consolidating the precincts established for general election precincts in said district to a number not exceeding six general election precincts for each

such bond election precinct, and shall designate a polling place and appoint one inspector, one judge and one clerk for each of such precincts. As an alternative, said ordinance may provide for the consolidation of said election with a statewide or other election in accordance with the provisions of the Elections Code governing consolidated elections.

In all particulars not recited in said ordinance, such election shall be held as nearly as practicable in conformity with the general election laws of the state.

Said board of supervisors shall cause a map or maps to be prepared covering general description of the work to be done, which said map shall show the location of the proposed works and improvements and shall cause the said map to be posted in a prominent place in the county courthouse for public inspection for at least thirty (30) days before the date fixed for such election.

Said ordinance calling for such election shall, prior to the date set forth for such election, be published pursuant to Section 6062 of the Government Code in a newspaper of general circulation circulated in said zone; the last publication of such ordinance must be at least fourteen (14) days before said election, and if there be no such newspaper, then such ordinance shall be posted in five public places in said zone for at least thirty (30) days before the date fixed for such election. No other notice of such election need be given.

Any defect or irregularity in the proceedings prior to the calling of such election shall not affect the validity of the bonds. If at such election two-thirds (2/3) of the votes cast are in favor of incurring such bonded indebtedness, then bonds of said district zone for the amount stated in such proceedings may be issued and sold as in this act provided.

§ 4605.1 Issuance of authorized but unissued bonds

Section 15.1. Authorized but unissued bonds in the amount of twenty-five million dollars (\$25,000,000) of Zone III of the Ventura County Watershed Protection District approved at an election within such zone on May 16, 1967, and any other authorized but unissued bonds for any zone of the Ventura County Watershed Protection District heretofore or hereafter authorized at an election within such zone, may be issued as to interest rates and maturities, in accordance with the provisions of, and subject only to, the limitations contained in Section 16 of this act as now or hereafter amended, any provisions or limitation to the contrary in the authorizations of such bonds notwithstanding.

§ 4606 Bonds; form; payment; series; maturity; denominations; interest; signatures; seal; authentication

Section 16. The board of supervisors shall, subject to this act, prescribe by ordinance or resolution the form for all bonds authorized to be issued or sold under this act. Bonds shall be issued in registered form. Bonds shall be payable substantially in accordance with this section. The board of supervisors may divide the principal amount of any issue into two or more series and fix different dates for the bonds of each series. The bonds of

one series may be made payable at different times from those of any other series, except that the earliest maturity of each issue or series, as the case may be, shall not be more than two years from the date of the bonds of that issue or series.

The final maturity date of any bond shall not exceed 40 years from the date of the bond. The board of supervisors may determine in the resolution authorizing the issuance of the bonds that the principal amount of the bonds maturing each year shall be other than an amount equal to an equal annual proportion of the aggregate principal of the bonds, and it may determine that the amount of principal maturing in each year plus the amount of interest payable in that year shall as nearly as possible be an aggregate amount that is equal each year, except for the principal and interest due on the first series of the bonds which shall be adjusted to reflect the amount of interest earned from the date when the bonds bear interest to the date when the first interest is payable on the bonds, or it may make such other determination as to the amount of the aggregate principal of the bonds which shall mature in each year as it shall choose.

The bonds shall be issued in such denominations the board of supervisors may determine, and shall be payable on the date and at the place fixed in the bonds, and with interest payable semiannually at the rate specified in the bonds, which rate shall not be in excess of the rate permitted under Article 7 (commencing with Section 53530), Chapter 3, Part 1 of Division 2 of Title 5 of the Government Code. The bonds shall be signed by the chairperson of the board of supervisors, and countersigned by the auditor of the County of Ventura, and the seal of the district shall be affixed thereto. The bonds may be authenticated by a paying agent selected by the board of supervisors, and the signatures of the chairperson and auditor thereon may be facsimile signatures. In case any officer whose signatures or countersignatures appear on the bonds shall cease to be such an officer before the delivery of the bonds to the purchaser, the signature or countersignature shall nevertheless be valid and sufficient for all purposes the same as if the officer had remained in office until the delivery of the bonds.

§ 4607 Bonds; issuance and sale; price; disposition of proceeds; payment from district fund

Section 17. The board of supervisors may issue and sell the bonds of the district or the zones authorized as provided in this act at not less than 95 percent of par value. The proceeds of the sale of the bonds shall be placed in the Treasury of the County of Ventura to credit of the district and the zone or special zone for which the bonds were issued, and the proper record of the transactions shall be placed on the books of the county treasury. The proceeds shall be applied exclusively to the purposes and objects mentioned in the ordinance or resolution calling the bond election, or, if pursuant to Sections 20.2 and 20.12 inclusive, no election is required, in the resolution confirming the engineer's report. Payments from district or zone funds shall be made upon demands prepared, presented, allowed, and audited in the same way as demands on the funds from the County of Ventura.

§ 4608 Bonds; lien; property tax for payment; individual zone liability

Section 18. Any bonds issued under the provisions of section 15 shall be a lien on all but only the taxable property of the zone of issuance, and the lien for the bonds of any issue shall be a preferred lien to that of any subsequent issue. The bonds and the interest thereon shall be paid by revenue derived from an annual tax upon all the taxable property within the zone, or out of any other funds of the zone and all the taxable property in the zone shall be and remain liable to be taxed for those payments as hereinafter provided. No zone of the Ventura County Watershed Protection District, nor the property therein, shall be liable for the bonded indebtedness of any other zone, nor shall any moneys derived from taxation in any of the several zones be used in payment of principal or interest of the bonded indebtedness of any other zone.

§ 4609 Tax or assessment; payment of bond interest and principal

Section 19. The board of supervisors shall levy a tax upon all taxable property or an assessment on all taxable real property, as the case may be, each year in the zone of issuance sufficient to pay so much of the interest as is due upon the bonds for that year and that portion of the principal thereof as is to become due before the time for making the next general tax levy which will not otherwise be paid out of other funds. The tax or assessment shall be levied and collected in the zone of issuance together with, and not separately from, taxes for county purposes, and when collected, shall be paid into the country treasury of Ventura County to the credit of the zone of issuance, to be used for the payment of the principal and interest on the bonds, and for no other purpose. The principal and interest on the bonds shall be paid by the country treasurer of Ventura County in the manner provided by law for the payment of principal and interest on bonds of the county.

§ 46.20 Tax or assessment; laws applicable

Section 20. So far as they are applicable and not in conflict with the specific provisions of this act, all matters relating to taxes and assessments levied pursuant to this act are to be governed by the laws of this State relating to county property taxes, and the duties of several county officers with respect thereto. Such officers shall be liable upon their several official bonds for the faithful discharge of the duties imposed upon them by this act.

§ 4620.1 Sections 4620.2 to 4620.12 Separate procedure for improvements, local payment therefore, and bond issuance

Section 20.1. The provisions of sections 20.2 to 20.12 inclusive, establish a separate and alternative authorization and procedure for making improvements, or paying the local share of the cost thereof, and issuing bonds of the district.

§ 4620.2 Bonds; flood control improvements; engineer report; cost estimates; map; assessment analysis; different benefit areas

Section 20.2. The board of supervisors may determine that it may be necessary to sell bonds of the district to finance needed flood control improvements for the protection and benefit of a zone or special zone of the district which the board determines cannot be financed from annual revenues from taxes or assessment, or both, over a period of years without selling bonds. The board of supervisors may also determine that it may be necessary to sell bonds of the district to finance the local share of the cost of any flood control improvements or projects undertaken by the federal government or the state, or both. The board of supervisors shall make these determinations by adopting a resolution indicating its intention to finance the improvements through the issuance of bonds, generally describing the improvements to be financed with the proceeds of the bonds, and referring the improvements to an engineer selected by the board and therein named for the preparation and filing with the board of a report with regard to the proposed improvements. The zone or special zone of the district which will benefit from the sale of the bonds and the flood control improvements to be financed shall be designated in the resolution of the board making those determinations.

The report shall contain, among other things, all of the following:

- a) A general description of the improvements.
- b) Estimates of the cost of the improvements, the cost of land, rights of way, and easements, incidental expenses in connection with the improvements, and expenses in connection with the issuance of the bonds, and if part of the cost of the improvements will be paid from contributions from the federal government or the state, or both, an estimate of the expected total amount of those contributions.
- c) A map which shows the location of the proposed improvements and lands, rights of way, easements, and property to be taken, acquired, or injured in carrying out the construction of the improvements, and any other information in regard to those matters as may be deemed useful. However, improvements, lands, rights of way, easements, and property which will be located outside the district or outside the zone or special zone need not be shown on the map.
- d) A general analysis by the engineer as to how the real property to be assessed in the zone or special zone and each proposed area of benefit therein will derive benefit from the proposed improvements.

The engineer may propose in the report that parcels of real property in the zone or special zone which benefit similarly, but differently from other parcels, from the improvements be included in different areas of benefit which shall be identified by boundary lines on a map or maps of the zone or special zone. The engineer may also propose assessments based on special benefit determined in accordance with Section 20.3.

§ 4620.3 Property located within designated floodway, floodplain or flood risk zone; special benefit assessment

Section 20.3. If the proposed improvements provide protection against flooding in a floodway or floodplain designated in the general plan of the County of Ventura or any city

therein or a floodplain area or flood risk zone established by the Secretary of Housing and Urban Development of the United States pursuant to Section 4101, et seq. of Title 42 of the United States Code, the fact that a lot or parcel of property is located within the floodway or plain or flood risk area shall be conclusive evidence that it will derive special benefit from the improvements. Assessments based on special benefit may be levied on lots and parcels of property in addition to assessments determined on the basis of proportionate stormwater runoff.

§ 4620.4 Engineer report; approval; hearing; notice; protest

Section 20.4.

(a) When the report of the engineer is filed with the board of supervisors, the board may, at a regular or special meeting, approve the report and schedule a hearing thereon. The hearing shall be scheduled not earlier than 30 days and not later than 90 days following approval of the report. Notice of the hearing shall be published pursuant to Section 6066 of the Government Code in a newspaper of general circulation in the zone or special zone, and the first publication shall occur not later than 20 days before the date of the hearing. The notice to be published shall be entitled: "Notice of Flood Control Improvements," and shall include the time and place of the hearing on the proposed improvements and on the proposed bonds and annual assessments; shall generally describe the proposed improvements and refer to the proposed bonds and annual assessments; shall generally describe the proposed improvements and refer to the report of the engineer for further particulars; shall state that the board of supervisors is considering issuing bonds to finance the cost of the proposed improvements, or the local share thereof, and the amount of the bonds which would be issued; shall also state that the board of supervisors is considering levying annual assessments on lots and parcels of real property in the zone or special zone to pay principal and interest on the bonds; and shall contain the name and telephone number of an officer or employee of the district to answer inquiries regarding the protest proceedings.

(b) A notice of the time and place of the hearing shall also be mailed, postage prepaid, to all persons owning real property in the zone or special zone as their names and addresses appear on the last equalized assessment roll for county taxes. The notices shall be mailed not later than 20 days before the date of the hearing. The notice to be mailed shall be entitled "Notice of Flood Control Improvements" and shall contain all of the following:

1. A statement of the time, place, and purpose of the hearing on improvements and the proposed annual assessments.
2. A statement of the total estimated cost of the proposed improvements.
3. A statement that the board of supervisors proposes to issue and sell bonds to finance the cost of the proposed improvements, or the local share thereof, and to levy annual assessments on lots and parcels of real property within the zone or special zone to pay the principal of, and interest on, the bonds.

4. The estimated amount of the typical annual assessments to be levied on the real property in the zone or special zone.
5. A statement that any owner of a lot or parcel of real property in the zone or special zone may file a written protest with the clerk.
6. The name and telephone number of an officer or employee of the district designated by the board of supervisors to answer inquiries regarding the protest proceedings.

(c) If the engineer's report proposes any assessments based on special benefit, separate notice shall be given to the owners of all real property on which assessments based on special benefit are proposed.

§ 4620.5 Filing protest

Section 20.5. Any owner of real property in the zone or special zone may file a written protest with the clerk at or before the time set for the hearing. Each protest shall contain a description of the lot or parcel in which each signer thereof has an ownership interest sufficient to identify the same and, if the signers are not shown on the last equalized assessment roll as the owners of the lot or parcel, the protest shall contain or be accompanied by written evidence that the signers are the owners of the property. The clerk shall endorse on each protest the date of its receipt, and at the time appointed for the hearing, shall represent to the board of supervisors all protests filed with the clerk.

§ 4620.6 Hearing

Section 20.6. At the time of the hearing, the engineer's report shall be summarized and the board of supervisors shall afford all persons who are present an opportunity to comment upon, object to, or present evidence with regard to, the proposed improvements, the issuance and sale of the bonds, the proposed estimated annual assessment against any lot or parcel of property, or any other matter relating thereto. At the conclusion of the hearing, the board of supervisors may confirm the report of the engineer or direct its modification in any respect, and thereafter confirm the report as modified. The hearing may be continued from time to time not exceeding a total of 180 days.

§ 4620.7 Protests by at least 25 percent of owners; issuance of bond amount exceeding flood control costs; elections

Section 20.7. If the board of supervisors finds that written protests filed at or before the time of the hearing are signed by the owners of more than 25 percent of the area of land in the zone or special zone, and protests are not withdrawn at the time of the hearing or continued hearing so as to reduce the protest in the zone or special zone below that percentage, the board of supervisors shall either abandon the proceedings or by duly adopted resolution submit the propositions of the issuance of the bonds and the levy of the assessments to the qualified electors within the zone or special zone from which the zone or special zone from which the protest was received and not so reduced, and shall

not proceed further with the proceedings as to a zone or special zone unless a majority of the votes cast at the election in the zone or special zone wherein it is held are in favor of the issuance of bonds and the levy of assessments. The election shall be held in conformity with the general election laws of the state.

Notwithstanding any other provision of the law, bonds shall not be issued pursuant to Section 20.2 to 20.1 2, inclusive, in amounts greater than that required to finance flood control projects or improvements identified pursuant to Section 20.2 and 20.4, unless the issuance of the bonds is first approved by a majority of the voters within the zone or special zone voting on the proposition of the issuance of the bonds.

§ 4620.8 Failed proposition; initiation of similar proposition

Section 20.8. If the board of supervisors abandons the proceedings rather than call an election, or if an election is held and a majority vote in favor of the propositions is not received, the board of supervisors shall not initiate similar proceedings within a period of 180 days from the date of adoption of the resolution ordering abandonment of the proceedings or the date of the election.

§ 4620.9 Approval of proposition; resolution adopting engineer report, ordering improvements, and issuing bonds

Section 20.9. If, at the conclusion of the hearing, the board of supervisors determines that protests received from the zone or special zone are below the percentage set forth in Section 20.7, or if the propositions regarding issuance of the bonds and the levy of annual assessments are submitted to election in the zone or special zone and the votes cast are in favor of the propositions, the board may adopt a resolution confirming the engineer's report and ordering the improvements, or payment of the local share of the cost thereof, if the improvements are to be undertaken by the federal government or the state, or both, and the issuance of the bonds.

§ 4620.10 Bond issuance and sale; bids or negotiated sale; counsel; underwriters

Section 20.10. The board of supervisors may authorize the issuance of bonds on the basis of competitive bids or negotiated sale. The board of supervisors shall establish a process for selecting bond counsel and, if the bonds are to be sold on the basis of a negotiated sale, the process of selecting underwriters. If competitive bids are to be received, notice of the time and place of the receipt of bids shall be published in a financial journal of general circulation in the state as provided in Section 6066 of the Government Code. The bonds shall be issued and sold as provided in and be subject to Sections 16 and 17.

§ 4620.11 Annual assessment upon real property; payment of bond principal and interest

Section 20.11. After the authorization and sale of bonds pursuant to Sections 20.2 and 20.10, inclusive, the board of supervisors shall levy an assessment each year upon the

real property in the zone or special zone in the manner prescribed herein in a total amount sufficient to pay interest on the bonds for that year and that portion of the principal thereof as is to become due before the time of making the next general tax levy. The board may also include in the total amount of the assessment levied in any year the estimated amount of the district's cost of levying and collecting the assessments, the cost of registration, transfer, and payment of the bonds, the expected amount of delinquency in payment of assessments, and the amount, if any, needed to replenish the reserve fund for the bonds as a result of past delinquencies in payment of assessments. The annual assessments shall be levied, collected, and become delinquent at the same time and in the same manner, and have the same lien priority and bear the same penalties and interest after delinquency as the general tax levy for county purposes. When collected, the assessments shall be paid into the county treasury of the County of Ventura to the credit of the district, and be used for the purposes for which it was levied, and for no other purpose. The principal of, and interest on, the bonds shall be paid by the county treasurer of the county in the manner provided by law for the payment of principal of, and interest on, bonds of the county, except that the board of supervisors may determine in the resolution authorizing the issuance of the bonds that the principal and interest shall be paid by a paying agent, other than the county treasurer, named therein.

§ 4620.12 Bond reserve fund

Section 20.12. The board of supervisors may include in the aggregate principal amount of the bonds an amount for a reserve fund for the payment of the principal of, and interest on, the bonds in the event that, as a result of delinquencies in the payment of annual assessments levied in the zone or special zone, there is a deficiency in the amount needed for the payment of principal and interest. The amount to be included for the reserve fund shall not exceed 15 percent of the total principal amount of the bonds. The reserve fund and all interest earned thereon shall be used for the payment of the principal of, and interest on, the bonds, if there is a deficiency, and then only to the extent of the deficiency, or such funds may be transferred to the redemption fund for the bonds for advance or final retirement of the bonds.

Notwithstanding any provision of this section, the amount and disposition of the reserve fund shall conform to the provisions of the Internal Revenue Code (Title 26 of the United States Code) or the regulations of the Department of the Treasury there under.

§ 4621 Bonds: legal investments

Section 21. The bonds of said Ventura County Watershed Protection District issued for any zone thereof pursuant to this act, shall be legal investments for all trust funds, and for the funds of all insurance companies, banks, both commercial and savings, and trust companies, and for the State school funds, and whenever any money or funds may by any law now or hereafter enacted be invested in bonds of cities, cities and counties, counties, school districts or municipalities in the State of California, such money or funds may be invested in the said bonds of said district issued in accordance with the provisions

of this act, and whenever bonds of cities, cities and counties, counties, school districts or municipalities, may by any law now or hereafter enacted be used as security for the performance of any act, such bonds of said district may be so used.

This section of this act is intended to be and shall be considered the latest enactment with respect to the matters herein contained, and any and all acts or parts of acts in conflict with the provisions hereof are hereby repealed.

§ 46Q2 Bonds; tax exemption; nature of district

Section 22. All bonds issued by said district under the provisions of this act shall be free and exempt from all taxation within the State of California. It is hereby declared that the district organized by this act is a reclamation district and an irrigation district within the meaning of Section 1 3/4, Article XIII, of the Constitution of this State.

§ 46Q3, 46Q3.1 Repealed by Stats. 1984, c. 1128, §§96, 97

§ 46Q4 Bonded improvement; conformity to report plans, specifications, etc.

Section 24. Any improvement for which bonds are voted under the provisions of this act, shall be made in conformity with the report, plans, specifications and map theretofore adopted, as above specified, unless the doing of any such work described in said report, shall be prohibited by law, or be rendered contrary to the best interests of the district by some change of conditions in relation thereto, or by the discovery of further or new information, in which event the board of supervisors may order necessary changes made in such proposed work or improvements and may cause any plans and specifications to be made and adopted therefor.

§ 46Q5 Zone bonds; issuance of additional bonds

Section 25. Whenever bonds have been authorized by any zone of said district and the proceeds of the sale thereof have been expended as in this act authorized, and said board of supervisors shall by resolution passed by a vote of all of its members determine that additional bonds should be issued for carrying out the work of flood control, or for any of the purposes of this act, said board of supervisors may again proceed as in this act provided, and submit to the qualified voters of said zone the question of issuing additional bonds in the same manner and with like procedure as hereinbefore provided, and all the above provisions of this act for the issuing and sale of such bonds, and for the expenditure of the proceeds thereof, shall be deemed to apply to such issue of additional bonds.

§ 46Q6 Zone bonds; defeat of proposal; waiting period before new election

Section 26. Should a proposition for issuing bonds for any zone submitted at any election under this act fail to receive the requisite number of votes of the qualified electors voting at such election to incur the indebtedness for the purpose specified, the said board of supervisors of said district shall not for six months after such election call [or other] another election in that zone for incurring indebtedness and issuing bonds under the

terms of this act, either for the same objects and purposes, or for any of the objects and purposes of this act.

§ 46Q7 Repeals of amendments; effect on obligations

Section 27. The repeal or amendment of this act shall not in any way affect or release any of the property in said district or any zone thereof from the obligations of any outstanding bonds or indebtedness until all such bonds and outstanding indebtedness have been fully paid and discharged.

§ 46Q8 Right of way over public lands

Section 28. There is hereby granted to Ventura County Watershed Protection District the right of way for the location, construction and maintenance of flood control channels, water distribution and transfer channels, ditches, waterways, conduits, canals, storm dikes, embankments and protective works in, over and across public lands of the State of California, not otherwise disposed of or in use, not in any case exceeding in length or width that which is necessary for the construction of such works and adjuncts or for the protection thereof. Whenever any selection of a right of way for such works or adjuncts thereto is made by the district, the board of supervisors thereof must transmit to the State Lands Commission, the Controller of the State and the recorder of the county in which the selected lands are situated, a plat of the lands so selected, giving the extent thereof and the uses for which the same are claimed or desired, duly verified to be correct. If the State Lands Commission shall approve the selections so made it shall endorse its approval upon the plat and issue to the district a permit to use such right of way and lands.

§ 46Q9 Flooding of streets; railroad, etc.; relocation

Section 29. In case any street, road, highway, railroad, canal, or other property subject or devoted to public use shall become subject to flooding or other interference by reason of the construction or proposed construction of any works of the district or project, the board of supervisors of the district may acquire by agreement or condemnation the right so to flood or otherwise interfere with that property, within or without the district, whether it be publicly or privately owned, and if such right be acquired by condemnation, the judgment may, if the court shall find that public necessity or convenience so requires, direct the district to relocate such street, road, highway, railroad, canal, or other property in accordance with plans prescribed by the court.

§ 46Q0 Liberal construction

Section 30. This act, and every part thereof, shall be liberally construed to promote the objects thereof, and to carry out its intents and purposes.

§ 46Q1 Partial invalidity

Section 31. In case any section or sections, or part of any section, of this act, shall be found to be unconstitutional or invalid, for any reason, the remainder of the act shall not thereby be invalidated, but shall remain in full force and effect.

§ 4632 Title of act

Section 32. This act may be known and may be cited as the Ventura County Watershed Protection Act.

§ 4633 Legislative declaration

Section 33. The area of the district is subject to periodical floods of devastating violence during the rainy seasons and during the dry seasons portions of the area are subject to extreme drought, greatly imperiling the health and lives of persons and livestock and the growing of crops. Recognizing this fact, the United States Army [Corps of] Engineers have made studies toward the economic advisability of flood control in Zones 1, 2, and 3. The recommendations of the United States Army [Corps of] Engineers for Zone 1 have been approved and are incorporated in an omnibus bill now presented to the Congress of the United States of America. The report on Zone 2 is almost completed and Zone 3 is under study. The general law contains no provision for the issuance of bonds for purposes of raising funds to assist in such work. The cost of adequate flood control is beyond the means of the property owners and taxpayers of said district, and it is necessary to negotiate to obtain financial aid from the United States Government. It is desirable to immediately form a political entity to satisfactorily deal with agencies of the United States Government.

Investigation having shown conditions in the County of Ventura to be peculiar to that county, it is hereby declared that a general law can not be made applicable thereto and that the enactment of this special law is necessary for the conservation, development, control and use of said waters for the protection of life and property therein and for the public good.

§ 4634 Action to determine validity of district

Section 34. The district formed under this act in order to determine the legality of its existence, may institute a proceeding therefor in the superior court of this State, in and for the County of Ventura, by filing with the clerk of said county a complaint setting forth the name of the district, its exterior boundaries, the date of its organization and a prayer that it be adjudged a legal flood control and water conservation and development district formed under the provisions of this act. The summons in such proceeding shall be served by publishing a copy thereof once a week for four weeks in some newspaper of general circulation published in said county. Within thirty (30) days after the last publication of said summons shall have been completed and proof thereof filed in said proceeding, any property owner or resident in said district, or any person interested may appear and answer said complaint, in which case said answer shall set forth the facts relied upon to show the invalidity of the district and shall be filed in such proceeding. If an answer be filed, the court shall proceed as in other civil cases. Such proceeding is hereby declared to be a proceeding in rem and the judgment rendered therein shall be conclusive against all persons whomsoever and against the State of California.

§ 4635 Bonds; issuance by district as a unit

Section 35. Notwithstanding any other provisions of this act, bonds may be issued by the Ventura County Flood Control District as a unit and without regard to zones to finance any project for importing water into the district for the benefit of the entire district. Said bonds shall be authorized and issued in the same manner and form and with the same effect and the proceeds shall be subject to the same restrictions as provided in Sections 15, 16, and 17 of this act for the issuance of bonds for any zone, except that it shall be sufficient to do anything required to be done by said sections as though the entire district constitutes but one zone. The form of the bond need not designate any participating zone but the bonds shall be issued in the name of the district.

Before any resolution required by the provisions of subdivision (1) of Section 15 is adopted, there shall first be on file in the office of the board of supervisors a report or reports from engineers showing the matters specified in subdivisions 1, 2, 3, 4, and 5 of Section 10 of this act, and if the project is undertaken or is to be undertaken in conjunction with or in cooperation with other public or private bodies, a general statement of the financing plan of the entire project shall likewise be on file. The resolution shall state that such report or reports are on file and shall refer to it or them for further particulars. The provisions of Section 21 of this act shall apply to bonds issued pursuant to this section and the provisions of Section 21 of this act shall apply to any issue of additional bonds under this section.

Any bonds issued under the provisions of this act shall be a lien upon all but only the taxable property in the district, and the lien for the bonds of any issue shall be a preferred lien to that of any subsequent issue. Said bonds and the interest thereon shall be paid by revenue derived from an annual tax upon all the taxable property within said district, and all the taxable property in said district shall be and remain liable to be taxed for such payments.

The board of supervisors shall levy a tax or assessment each year upon said bonds for that year and such portion of the principal thereof as is to become due before the time for making the next general tax levy which will not otherwise be paid out of other funds. Such tax shall be levied and collected in the district together with and not separately from taxes for county purposes, and when collected shall be paid into the county treasury of said Ventura County to the credit of the district, and be used for the payment of the principal and interest on said bonds and for no other purpose. The principal and interest on said bonds shall be paid by the County Treasurer of said Ventura County in the manner provided by law for the payment of principal and interest on bonds of said county. Any funds of the district received from the sale of water imported as the result of the construction of any project by the expenditure of money raised by the sale of bonds issued in accordance with this section or by the sale or rental of any property purchased in accordance with this section may be applied toward the payment of the principal and interest on said bonds without, however, causing said bonds to be or to become revenue bonds. Taxes or assessments levied pursuant to the provisions of this section are

declared to be for the common benefit of the district as a whole and it is further declared that all property within the district is equally benefitted by any action taken under the provisions of this section.

Should a proposition for issuing bonds for the district submitted at any election under this section fail to receive the requisite number of votes of the qualified electors voting at such election to incur the indebtedness for the purposes specified, the board of supervisors of said district shall not for six months after such election call or order another election in the district for incurring indebtedness and issuing bonds under the terms of this section.

§ 4636 Improvement districts; formation; purposes; levy and collection of taxes

Section 36. Notwithstanding anything in this act to the contrary, improvement districts may be formed in the district or in any zone or in any combination of zones for the purpose of importing water or to engage(d) in any purpose for which an improvement district in an irrigation district may be formed pursuant to Part 7 (commencing with Section 23600) Division 11 of the Water Code. The board shall have the same rights, powers, duties and responsibilities with respect to the formation and government of improvement districts for any of these purposes, including the importation of water, as the board of directors of an irrigation district has with respect to improvement districts in irrigation districts, and assessments for any improvement district shall be levied, collected and enforced at the same time and as nearly in the same manner as practicable as annual taxes of the county, except that the assessment shall be made in the same manner as provided with respect to improvement districts in irrigation districts.

The provisions of the Improvement Act of 1911, the Municipal Improvement Act of 1913, and the Improvement Bond Act of 1915 are applicable to the district for any of the purposes authorized by this section. Such acts or any of them may be used in the discretion of the board in the construction of work to be done or improvements made under this act and in the levying of assessments and reassessments and the issuing of bonds to pay for costs and expenses of the work and improvements done or to be done hereunder.

The powers conferred by this section are in addition to the powers conferred by any other section of this act or other law.

§ 4637 Action to test validity of bonds, special assessment or contract Section 37.

An action to determine the validity of bonds, levy of any assessment, or a contract may be brought pursuant to Chapter 9 (commencing with Section 860) of Title 10 of Part 2 of the Code of Civil Procedure. In any such action, all findings of fact or conclusions of the board of supervisors upon all matters shall be conclusive unless the action was instituted within six months after the finding or conclusion was made.

§ 4637.1 Action to test validity of proceedings regarding flood control improvements; limitations; appeal; bonds as evidence of regularity of proceedings

Ventura County Watershed Protection Act

Section 37.1. The validity of any proceedings conducted under Sections 20.2 to 20.12, inclusive, shall not be contested in any action or proceeding unless the action or proceeding is commenced within 30 days after the adoption by the Board of supervisors of a resolution or resolutions confirming, or modifying and confirming as modified, the engineer's report and authorizing the issuance of bonds. An appeal from a final judgment in any such action or proceeding shall be perfected within 30 days after the entry of a judgment. Bonds issued under Section 20.2 to 20.12, inclusive, shall be conclusive evidence of the regularity of all proceedings leading up to the issuance of the bonds.

§ 4637.2 Special assessment investigation, limitation and majority protest act of 1931; application

Section 37.2. The Special Assessment Investigation, Limitation and Majority Protest Act of 1931 (Division 4 starting with Section 2800 of the Streets and Highways Code) does not apply to assessments levied

ATTACHMENT 16


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SB-231 Local government: fees and charges. (2017-2018)

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Senate Bill No. 231

CHAPTER 536

An act to amend Section 53750 of, and to add Section 53751 to, the Government Code, relating to local government finance.

[Approved by Governor October 06, 2017. Filed with Secretary of State October 06, 2017.]

LEGISLATIVE COUNSEL'S DIGEST

SB 231, Hertzberg. Local government: fees and charges.

Articles XIII C and XIII D of the California Constitution generally require that assessments, fees, and charges be submitted to property owners for approval or rejection after the provision of written notice and the holding of a public hearing. Existing law, the Proposition 218 Omnibus Implementation Act, prescribes specific procedures and parameters for local jurisdictions to comply with Articles XIII C and XIII D of the California Constitution and defines terms for these purposes.

This bill would define the term "sewer" for these purposes. The bill would also make findings and declarations relating to the definition of the term "sewer" for these purposes.

Vote: majority Appropriation: no Fiscal Committee: no Local Program: no

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 53750 of the Government Code is amended to read:

53750. For purposes of Article XIII C and Article XIII D of the California Constitution and this article, the following words have the following meanings, and shall be read and interpreted in light of the findings and declarations contained in Section 53751:

(a) "Agency" means any local government as defined in subdivision (b) of Section 1 of Article XIII C of the California Constitution.

(b) "Assessment" means any levy or charge by an agency upon real property that is based upon the special benefit conferred upon the real property by a public improvement or service, that is imposed to pay the capital cost of the public improvement, the maintenance and operation expenses of the public improvement, or the cost of the service being provided. "Assessment" includes, but is not limited to, "special assessment," "benefit assessment," "maintenance assessment," and "special assessment tax."

(c) "District" means an area that is determined by an agency to contain all of the parcels that will receive a special benefit from a proposed public improvement or service.

(d) "Drainage system" means any system of public improvements that is intended to provide for erosion control, for landslide abatement, or for other types of water drainage.

(e) "Extended," when applied to an existing tax or fee or charge, means a decision by an agency to extend the stated effective period for the tax or fee or charge, including, but not limited to, amendment or removal of a sunset provision or expiration date.

(f) "Flood control" means any system of public improvements that is intended to protect property from overflow by water.

(g) "Identified parcel" means a parcel of real property that an agency has identified as having a special benefit conferred upon it and upon which a proposed assessment is to be imposed, or a parcel of real property upon which a proposed property-related fee or charge is proposed to be imposed.

(h) (1) "Increased," when applied to a tax, assessment, or property-related fee or charge, means a decision by an agency that does either of the following:

(A) Increases any applicable rate used to calculate the tax, assessment, fee, or charge.

(B) Revises the methodology by which the tax, assessment, fee, or charge is calculated, if that revision results in an increased amount being levied on any person or parcel.

(2) A tax, fee, or charge is not deemed to be "increased" by an agency action that does either or both of the following:

(A) Adjusts the amount of a tax, fee, or charge in accordance with a schedule of adjustments, including a clearly defined formula for inflation adjustment that was adopted by the agency prior to November 6, 1996.

(B) Implements or collects a previously approved tax, fee, or charge, so long as the rate is not increased beyond the level previously approved by the agency, and the methodology previously approved by the agency is not revised so as to result in an increase in the amount being levied on any person or parcel.

(3) A tax, assessment, fee, or charge is not deemed to be "increased" in the case in which the actual payments from a person or property are higher than would have resulted when the agency approved the tax, assessment, fee, or charge, if those higher payments are attributable to events other than an increased rate or revised methodology, such as a change in the density, intensity, or nature of the use of land.

(i) "Notice by mail" means any notice required by Article XIII C or XIII D of the California Constitution that is accomplished through a mailing, postage prepaid, deposited in the United States Postal Service and is deemed given when so deposited. Notice by mail may be included in any other mailing to the record owner that otherwise complies with Article XIII C or XIII D of the California Constitution and this article, including, but not limited to, the mailing of a bill for the collection of an assessment or a property-related fee or charge.

(j) "Record owner" means the owner of a parcel whose name and address appears on the last equalized secured property tax assessment roll, or in the case of any public entity, the State of California, or the United States, means the representative of that public entity at the address of that entity known to the agency.

(k) "Sewer" includes systems, all real estate, fixtures, and personal property owned, controlled, operated, or managed in connection with or to facilitate sewage collection, treatment, or disposition for sanitary or drainage purposes, including lateral and connecting sewers, interceptors, trunk and outfall lines, sanitary sewage treatment or disposal plants or works, drains, conduits, outlets for surface or storm waters, and any and all other works, property, or structures necessary or convenient for the collection or disposal of sewage, industrial waste, or surface or storm waters. "Sewer system" shall not include a sewer system that merely collects sewage on the property of a single owner.

(l) "Registered professional engineer" means an engineer registered pursuant to the Professional Engineers Act (Chapter 7 (commencing with Section 6700) of Division 3 of the Business and Professions Code).

(m) "Vector control" means any system of public improvements or services that is intended to provide for the surveillance, prevention, abatement, and control of vectors as defined in subdivision (k) of Section 2002 of the Health and Safety Code and a pest as defined in Section 5006 of the Food and Agricultural Code.

(n) "Water" means any system of public improvements intended to provide for the production, storage, supply, treatment, or distribution of water from any source.

SEC. 2. Section 53751 is added to the Government Code, to read:

53751. The Legislature finds and declares all of the following:

(a) The ongoing, historic drought has made clear that California must invest in a 21st century water management system capable of effectively meeting the economic, social, and environmental needs of the state.

(b) Sufficient and reliable funding to pay for local water projects is necessary to improve the state's water infrastructure.

(c) Proposition 218 was approved by the voters at the November 5, 1996, statewide general election. Some court interpretations of the law have constrained important tools that local governments need to manage storm water and drainage runoff.

(d) Storm waters are carried off in storm sewers, and careful management is necessary to ensure adequate state water supplies, especially during drought, and to reduce pollution. But a court decision has found storm water subject to the voter-approval provisions of Proposition 218 that apply to property-related fees, preventing many important projects from being built.

(e) The court of appeal in *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351 concluded that the term "sewer," as used in Proposition 218, is "ambiguous" and declined to use the statutory definition of the term "sewer system," which was part of the then-existing law as Section 230.5 of the Public Utilities Code.

(f) The court in *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351 failed to follow long-standing principles of statutory construction by disregarding the plain meaning of the term "sewer." Courts have long held that statutory construction rules apply to initiative measures, including in cases that apply specifically to Proposition 218 (see *People v. Bustamante* (1997) 57 Cal.App.4th 693; *Keller v. Chowchilla Water Dist.* (2000) 80 Cal.App.4th 1006). When construing statutes, courts look first to the words of the statute, which should be given their usual, ordinary, and commonsense meaning (*People v. Mejia* (2012) 211 Cal.App.4th 586, 611). The purpose of utilizing the plain meaning of statutory language is to spare the courts the necessity of trying to divine the voters' intent by resorting to secondary or subjective indicators. The court in *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351 asserted its belief as to what most voters thought when voting for Proposition 218, but did not cite the voter pamphlet or other accepted sources for determining legislative intent. Instead, the court substituted its own judgment for the judgment of voters.

(g) Neither the words "sanitary" nor "sewerage" are used in Proposition 218, and the common meaning of the term "sewer services" is not "sanitary sewerage." In fact, the phrase "sanitary sewerage" is uncommon.

(h) Proposition 218 exempts sewer and water services from the voter-approval requirement. Sewer and water services are commonly considered to have a broad reach, encompassing the provision of clean water and then addressing the conveyance and treatment of dirty water, whether that water is rendered unclean by coming into contact with sewage or by flowing over the built-out human environment and becoming urban runoff.

(i) Numerous sources predating Proposition 218 reject the notion that the term "sewer" applies only to sanitary sewers and sanitary sewerage, including, but not limited to:

(1) Section 230.5 of the Public Utilities Code, added by Chapter 1109 of the Statutes of 1970.

(2) Section 23010.3, added by Chapter 1193 of the Statutes of 1963.

(3) The Street Improvement Act of 1913.

(4) *L.A. County Flood Control Dist. v. Southern Cal. Edison Co.* (1958) 51 Cal.2d 331, where the California Supreme Court stated that "no distinction has been made between sanitary sewers and storm drains or sewers."

(5) Many other cases where the term "sewer" has been used interchangeably to refer to both sanitary and storm sewers include, but are not limited to, *County of Riverside v. Whitlock* (1972) 22 Cal.App.3d 863, *Ramseier v. Oakley Sanitary Dist.* (1961) 197 Cal.App.2d 722, and *Torson v. Fleming* (1928) 91 Cal.App. 168.

(6) Dictionary definitions of sewer, which courts have found to be an objective source for determining common or ordinary meaning, including Webster's (1976), American Heritage (1969), and Oxford English Dictionary (1971).

(j) Prior legislation has affirmed particular interpretations of words in Proposition 218, specifically Assembly Bill 2403 of the 2013–14 Regular Session (Chapter 78 of the Statutes of 2014).

(k) In *Crawley v. Alameda Waste Management Authority* (2015) 243 Cal.App.4th 396, the Court of Appeal relied on the statutory definition of "refuse collection services" to interpret the meaning of that phrase in Proposition 218, and found that this interpretation was further supported by the plain meaning of refuse. Consistent with this decision, in determining the definition of "sewer," the plain meaning rule shall apply in conjunction with the definitions of terms as provided in Section 53750.

(l) The Legislature reaffirms and reiterates that the definition found in Section 230.5 of the Public Utilities Code is the definition of "sewer" or "sewer service" that should be used in the Proposition 218 Omnibus Implementation Act.

(m) Courts have read the Legislature's definition of "water" in the Proposition 218 Omnibus Implementation Act to include related services. In *Griffith v. Pajaro Valley Water Management Agency* (2013) 220 Cal.App.4th 586, the Court of Appeal concurred with the Legislature's view that "water service means more than just supplying water," based upon the definition of water provided by the Proposition 218 Omnibus Implementation Act, and found that actions necessary to provide water can be funded through fees for water service. Consistent with this decision, "sewer" should be interpreted to include services necessary to collect, treat, or dispose of sewage, industrial waste, or surface or storm waters, and any entity that collects, treats, or disposes of any of these necessarily provides sewer service.

ATTACHMENT 17

Barclays Official California Code of Regulations Currentness

Title 23. Waters

Division 3. State Water Resources Control Board and Regional Water Quality Control Boards

Chapter 9. Waste Discharge Reports and Requirements

Article 3. Waste Discharges from Point Sources to Navigable Waters

23 CCR § 2235.2

§ 2235.2. Compliance with Regulations of the U.S. Environmental Protection Agency.

Waste discharge requirements for discharge from point sources to navigable waters shall be issued and administered in accordance with the currently applicable federal regulations for the National Pollutant Discharge Elimination System (NPDES) program.

Note: Authority cited: [Section 1058, Water Code](#). Reference: Chapter 5.5 (commencing with [Section 13370](#)) of [Division 7, Water Code](#).

This database is current through 10/13/17 Register 2017, No. 41

23 CCR § 2235.2, 23 CA ADC § 2235.2

End of Document

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ATTACHMENT 18

Barclays Official California Code of Regulations Currentness

Title 23. Waters

Division 3. State Water Resources Control Board and Regional Water Quality Control Boards

Chapter 9. Waste Discharge Reports and Requirements

Article 3. Waste Discharges from Point Sources to Navigable Waters

23 CCR § 2235.3

§ 2235.3. Additional Requirements.

In addition to the federal regulations, waste discharge requirements prescribed for discharges to navigable water shall be in compliance with applicable state regulations, including, when appropriate, the requirements of Sections 2230(c), 2232 and 2233.

Note: Authority cited: [Sections 185 and 1058, Water Code](#). Reference: [Section 13263, Water Code](#).

HISTORY

1. Amendment filed 4-16-82; effective upon filing pursuant to [Government Code Section 11346.2\(d\)](#) (Register 82, No. 16).

This database is current through 10/13/17 Register 2017, No. 41

23 CCR § 2235.3, 23 CA ADC § 2235.3

ATTACHMENT 19



KeyCite Yellow Flag - Negative Treatment

Declined to Follow by [Conservation Law Foundation v. Hannaford Bros. Co.](#), D.Vt., May 14, 2004

568 F.2d 1369

United States Court of Appeals,
District of Columbia Circuit.

NATURAL RESOURCES DEFENSE COUNCIL, INC. *

v.

Douglas M. COSTLE, Administrator, Environmental Protection
Agency, et al., National Forest Products Association, Appellant.

NATURAL RESOURCES DEFENSE COUNCIL, INC., etc.

v.

Douglas M. COSTLE, Administrator, Environmental Protection
Agency, et al., National Milk Producers Federation, Appellant.

NATURAL RESOURCES DEFENSE COUNCIL, INC., etc.

v.

Douglas M. COSTLE, Administrator, and Environmental Protection Agency, et al., Appellants.

NATURAL RESOURCES DEFENSE COUNCIL, INC.

v.

Douglas M. COSTLE, Administrator, Environmental Protection
Agency, Colorado River Water Conservation District, Appellant.

Nos. 75-2056, 75-2066, 75-2067 and 75-2235.

|

Argued Dec. 3, 1976.

|

Decided Nov. 16, 1977.

The National Resources Defense Council, Inc. challenged authority of the Environmental Protection Agency Administrator to exempt categories of point sources from permit requirements of the Federal Water Pollution Control Act Amendments of 1972. The United States District Court for the District of Columbia, Thomas A. Flannery, J., [396 F.Supp. 1393](#), granted summary judgment to the NRDC and the Administrator and others appealed. The Court of Appeals, Leventhal, Circuit Judge, held that: (1) legislative history shows that National Pollution Discharge Elimination System permit is the only means by which discharger may escape total prohibition of discharges from point sources found in FWPCA; (2) national effluent limitations need not be uniform as precondition for NPDES program to include pollution from agricultural, silvicultural, and storm runoff point sources, and while technological or administrative infeasibility of such limitations may warrant adjustments in permit program it does not authorize Administrator to exclude relevant point sources; (3) where numeric effluent limitations are infeasible, permit conditions may proscribe industry practices that aggravate problems of point source pollution as well as require monitoring and reporting of effluent level; and (4) a number of administrative devices, including general or area permits are available to aid EPA in practical administration of NPDES program, and FWPCA, however tight in some respects, leaves some leeway to EPA in interpretation of that statute and affords agency some means to consider matters of feasibility.

Affirmed in accordance with opinion.

MacKinnon, Circuit Judge, filed a concurring opinion.

West Headnotes (8)

[1] **Environmental Law** 🔑 **Discharge of Pollutants**

Legislative history clearly shows that Congress intended that the national pollution discharge elimination system permit be the only means by which a discharger of pollutant may escape total prohibition of discharges from point sources found in Federal Water Pollution Control Act Amendments. Federal Water Pollution Control Act, §§ 301, 301(a), 402 as amended 33 U.S.C.A. §§ 1311, 1311(a), 1342.

[33 Cases that cite this headnote](#)

[2] **Environmental Law** 🔑 **Discharge of Pollutants**

Use of word “may” in that section of Federal Water Pollution Control Act Amendment providing that the administrator may issue permit for discharge of any pollutant means only that the administrator has the discretion either to issue permit or to leave pollutant discharger subject to total proscription of statute making discharge of any pollutant by any person unlawful except as provided in Act. Federal Water Pollution Control Act, §§ 301(a), 302, 304 as amended 33 U.S.C.A. §§ 1311(a), 1342, 1344.

[17 Cases that cite this headnote](#)

[3] **Environmental Law** 🔑 **Substances, Sources, and Activities Regulated**

Environmental Law 🔑 **Discharge of Pollutants**

Existence of uniform national effluent limitations is not a necessary precondition for incorporating into the national pollutant discharge elimination system program pollution from agricultural, silvicultural, and storm water runoff point sources; technological or administrative infeasibility of such limitations may result in adjustments in permit programs but does not authorize administrator to exclude relevant point sources from program. Federal Water Pollution Control Act, §§ 301, 402, 404, 1362(12, 14), as amended 33 U.S.C.A. §§ 1311, 1342, 1344, 502(12, 14).

[63 Cases that cite this headnote](#)

[4] **Environmental Law** 🔑 **Conditions and Limitations**

Where numeric effluent limitations are infeasible, point of discharge permits may proscribe industry practices which aggravate problems of point source pollution as well as require monitoring and reporting of effluent levels contrary to claim that any limitations must be issued in terms of a numerical effluent standard. Federal Water Pollution Control Act, §§ 302(a), 402, 402(a) as amended 33 U.S.C.A. §§ 1312(a), 1342, 1342(a).

[25 Cases that cite this headnote](#)

[5] **Environmental Law** 🔑 **Discharge of Pollutants**

Federal Water Pollution Control Act Amendments merely require that point of discharge permits be in compliance with limitations section of Act and as a result the use of area or general permits is allowed. Federal Water Pollution Control Act, § 402 as amended 33 U.S.C.A. § 1342.

[5 Cases that cite this headnote](#)

[6] **Environmental Law** 🔑 **Water Pollution**

Power to define point and nonpoint sources of pollution is vested in Environmental Protection Agency under the Federal Water Pollution Control Act Amendments, and exercise of that power should be reviewed by court only after opportunity for full agency review and examination. Federal Water Pollution Control Act, § 402 as amended [33 U.S.C.A. § 1342](#).

[8 Cases that cite this headnote](#)

[7] **Environmental Law** 🔑 **Administrative Agencies and Proceedings**

Federal Water Pollution Control Act Amendments, however tight in some respects, leave some leeway to Environmental Protection Agency in interpretation and affords agency some means to consider matter of feasibility. Federal Water Pollution Control Act, §§ 1-26, 101-517 as amended [33 U.S.C.A. §§ 1151-1175, 1251-1376](#).

[Cases that cite this headnote](#)

[8] **Administrative Law and Procedure** 🔑 **Statutory Basis and Limitation**

It is not what court thinks that is generally appropriate to regulatory process, but what Congress intended.

[2 Cases that cite this headnote](#)

***1370 **148** *Syllabus by the Court*

The National Resources Defense Council, Inc. (NRDC) challenged the authority of the EPA Administrator to exempt categories of point sources from the permit requirements of s 402 of the Federal Water Pollution Control Act Amendments of 1972, [33 U.S.C. s 1342 \(Supp. V 1975\)](#). On appeal from a grant of summary judgment to NRDC, held:

1. The legislative history makes clear that Congress intended the National Pollution Discharge Elimination System (NPDES) permit to be the only means by which a discharger may escape the total prohibition of discharges from point sources found in FWPCA s 301(a), [33 U.S.C. s 1311\(a\)](#) (Supp. V 1975).
2. It is not necessary that national effluent limitations be uniform as a precondition for the NPDES program to include pollution from agricultural, silvicultural, and storm water runoff point sources. The technological or administrative infeasibility ***1371 **149** of such limitations may warrant adjustments in the permit program, but it does not authorize the Administrator to exclude the relevant point source from the NPDES program.
3. Where numeric effluent limitations are infeasible, permit conditions may proscribe industry practices that aggravate the problems of point source pollution as well as require monitoring and reporting of effluent levels.
4. A number of administrative devices, including general or area permits, are available to aid EPA in the practical administration of the NPDES program. The FWPCA, however tight in some respects, leaves some leeway to EPA in the interpretation of that statute and, in that regard, affords the agency some means to consider matters of feasibility.

Appeals from the United States District Court for the District of Columbia (D.C. Civil 1629-73).

Attorneys and Law Firms

Irvin B. Nathan, Washington, D. C., with whom Burton J. Mallinger, Washington, D. C., was on the brief, for appellant in No. 75-2056.

Charles W. Bills, Washington, D. C., with whom James R. Murphy, Washington, D. C., was on the brief for appellant in No. 75-2066.

G. William Frick, Atty., Dept. of Justice, Kansas City, Mo., of the bar of the Supreme Court of Missouri, pro hac vice by special leave of court for appellants in No. 75-2067. Peter R. Taft, Asst. Atty. Gen., Robert V. Zener, Gen. Counsel, Environmental Protection Agency, Edmund B. Clark, Lloyd S. Guerci, Larry A. Boggs, Attys., Dept. of Justice and Pamela P. Quinn, Atty., Environmental Protection Agency, Washington, D. C., were on the brief for appellants in No. 75-2067.

Christopher D. Williams, Washington D. C., with whom Kenneth Balcomb and Robert L. McCarty, Washington, D. C., were on the brief for appellant in No. 75-2235.

J. G. Speth, Washington, D. C., for appellee.

Theodore O. Torve, Asst. Atty. Gen., State of Washington, Olympia, Wash., filed a brief on behalf of the State of Washington as amicus curiae urging reversal in No. 75-2056.

Richard E. Schwartz, Jefferson City, Mo., filed a brief on behalf of Iron and Steel Institute, as amicus curiae urging reversal in No. 75-2067.

John L. Hill, Atty. Gen., State of Texas, and David M. Kendall, Jr., First Asst. Atty. Gen., State of Texas, Austin, Tex., filed a brief on behalf of State of Texas as amicus curiae urging reversal in No. 75-2067.

Before BAZELON, Chief Judge, and LEVENTHAL and MacKINNON, Circuit Judges.

Opinion

Opinion for the Court filed by LEVENTHAL, Circuit Judge.

Concurring Opinion filed by MacKINNON, Circuit Judge.

LEVENTHAL, Circuit Judge:

In 1972 Congress passed the Federal Water Pollution Control Act Amendments (hereafter referred to as the "FWPCA" or the "Act"¹). It was a dramatic response to accelerating environmental degradation of rivers, lakes and streams in this country. The Act's stated goal is to eliminate the discharge of pollutants into the Nation's waters by 1985. This goal is to be achieved through the enforcement of the strict timetables and technology-based effluent limitations established by the Act.

The FWPCA sets up a permit program, the National Pollutant Discharge Elimination System (NPDES), as the primary means of enforcing the Act's effluent limitations.² At issue in this case is the authority *1372 **150 of the Administrator of the Environmental Protection Agency to make exemptions from this permit component of the FWPCA.

Section 402 of the FWPCA, 33 U.S.C. s 1342 (Supp. V 1975), provides that under certain circumstances the EPA Administrator "may . . . issue a permit for the discharge of any pollutant" notwithstanding the general proscription of pollutant discharges found in s 301 of the Act. 33 U.S.C. s 1311 (Supp. V 1975). The discharge of a pollutant is defined in the FWPCA as "any addition of any pollutant to navigable waters from any point source" or "any addition of any

pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or floating craft.” 33 U.S.C. s 1362(12) (Supp. V 1975). In 1973 the EPA Administrator issued regulations that exempted certain categories of “point sources” of pollution from the permit requirements of s 402.³ The Administrator's purported authority to make such exemptions turns on the proper interpretation of s 402.

A “point source” is defined in s 502(14) as “any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.”⁴

The 1973 regulations exempted discharges from a number of classes of point sources from the permit requirements of s 402, including all silvicultural point sources; all confined animal feeding operations below a certain size; all irrigation return flows from areas of less than 3,000 contiguous acres or 3,000 noncontiguous acres that use the same drainage system; all nonfeedlot, nonirrigation agricultural point sources; and separate storm sewers containing only storm runoff uncontaminated by any industrial or commercial activity.⁵ The EPA's *1373 **151 rationale for these exemptions is that in order to conserve the Agency's enforcement resources for more significant point sources of pollution, it is necessary to exclude these smaller sources of pollutant discharges from the permit program.

The National Resources Defense Council, Inc. (NRDC) sought a declaratory judgment that the regulations are unlawful under the FWPCA. Specifically, NRDC contended that the Administrator does not have authority to exempt any class of point source from the permit requirements of s 402. It argued that Congress in enacting ss 301, 402 of the FWPCA intended to prohibit the discharge of pollutants from all point sources unless a permit had been issued to the discharger under s 402 or unless the point source was explicitly exempted from the permit requirements by statute. The District Court granted NRDC's motion for summary judgment. It held that the FWPCA does not authorize the Administrator to exclude any class of point sources from the permit program. *NRDC v. Train*, 396 F.Supp. 1393 (D.D.C.1975). The EPA has appealed to this court. It is joined on appeal by a number of defendant-intervenors, National Forest Products Association (NFPA), National Milk Producers Federation (NMPF), and the Colorado River Conservation District.⁶

This case thus presents principally a question of statutory interpretation. EPA also argues that even if Congress intended to include the pertinent categories in the permit program, the regulations exempting them should be upheld on a doctrine of administrative infeasibility, i. e., the regulations should be upheld as a deviation from the literal terms of the FWPCA that is necessary to permit the Agency to realize the principal objectives of the Act.

I. LEGISLATIVE HISTORY

The principal purpose of the FWPCA is “to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.”⁷ The Act's ultimate objective, to eliminate the discharge of pollutants into navigable waters by 1985, is to be achieved by means of two intermediate steps. As of July 1, 1977, all point sources other than publicly owned treatment works were to have achieved effluent limitations that require application of the “best practicable control technology.”⁸ These same point sources must reduce their effluent discharges by July 1, 1983, to meet limitations determined by application of the “best available technology economically achievable” for each category of point source.⁹

The technique for enforcing these effluent limitations is straightforward. Section 301(a) of the FWPCA provides:

Except as in compliance with this section and sections 302, 306, 307, 318, 402, and 404 of this Act, the discharge of any pollutant by any person shall be unlawful.¹⁰

Appellants concede that if the regulations are valid, it must be because they are authorized *1374 **152 by s 402; none of the other sections listed in s 301(a) afford grounds for relieving the exempted point sources from the prohibition of s 301.¹¹

Section 402 provides in relevant part that the Administrator may, after opportunity for public hearing, issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 301(a), upon condition that such discharge will meet either all applicable requirements under sections 301, 302, 306, 307, 308, and 403 of this Act, or prior to the taking of the necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this Act.

The NPDES permit program established by s 402 is central to the enforcement of the FWPCA. It translates general effluent limitations into the specific obligations of a discharger. As this court noted in [NRDC v. Train, 166 U.S.App.D.C. 312, 315, 510 F.2d 692, 695 \(1975\)](#), the Act “relies primarily on a permit program for the achievement of effluent limitations . . . to attain its goals.” The comments in floor debates of Senator Muskie, the leading Congressional sponsor of the Act, makes this clear.¹²

The appellants argue that s 402 not only gives the Administrator the discretion to grant or refuse a permit, but also gives him the authority to exempt classes of point sources from the permit requirements entirely. They argue that this interpretation is supported by the legislative history of s 402 and the fact that unavailability of this exemption power would place unmanageable administrative burdens on the EPA.

[1] Putting aside for the moment the appellants' administrative infeasibility argument, we agree with the District Court that the legislative history makes clear that Congress intended the NPDES permit to be the only means by which a discharger from a point source may escape the total prohibition of s 301(a). This intention is evident in both Committee Reports. In discussing s 301 the House Report stressed:

Any discharge of a pollutant without a permit issued by the Administrator under section 318, or by the Administrator or the State under section 402 or by the Secretary of the Army under section 404 is unlawful. Any discharge of a pollutant not in compliance with the conditions or limitations of such a permit is also unlawful.¹³

The Senate Report echoed this interpretation:

(Section 301) clearly establishes that the discharge of pollutants is unlawful. Unlike its predecessor program which permitted the discharge of certain amounts of pollutants under the conditions described above, this legislation would clearly establish that no one has the right *1375 **153 to pollute that pollution continues because of technological limits, not because of any inherent rights to use the nation's waterways for the purpose of disposing of wastes.

The program proposed by this Section will be implemented through permits issued in Section 402. The Administrator will have the capability and the mandate to press technology and economics to achieve those levels of effluent reduction which he believes to be practicable in the first instance and attainable in the second.¹⁴

[2] The EPA argues that since s 402 provides that “the Administrator may . . . issue a permit for the discharge of any pollutant” (emphasis added), he is given the discretion to exempt point sources from the permit requirements altogether. This argument, as to what Congress meant by the word “may” in s 402, is insufficient to rebut the plain language of the statute and the committee reports. We say this with due awareness of the deference normally due “the construction of a new statute by its implementing agency.” [NRDC v. Train, 166 U.S.App.D.C. at 326, 510 F.2d at 706](#); see [Zuber v. Allen, 396 U.S. 168, 192, 90 S.Ct. 314, 24 L.Ed.2d 345 \(1969\)](#); [Udall v. Tallman, 380 U.S. 1, 16, 85 S.Ct. 792, 13 L.Ed.2d 616 \(1965\)](#). The use of the word “may” in s 402 means only that the Administrator has discretion either to issue a permit or to leave the discharger subject to the total proscription of s 301. This is the natural reading, and the one that retains the fundamental logic of the statute.

Under the EPA's interpretation the Administrator would have broad discretion to exempt large classes of point sources from any or all requirements of the FWPCA. This is a result that the legislators did not intend. Rather they stressed that the FWPCA was a tough law that relied on explicit mandates to a degree uncommon in legislation of this type. A statement of Senator Jennings Randolph of West Virginia, Chairman of the Senate Committee responsible for the Act, is illustrative.

I stress very strongly that Congress has become very specific on the steps it wants taken with regard to environmental protection. We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives for administrators to follow. . . .

In the past, too many of our environmental laws have contained vague generalities. What we are attempting to do now is provide laws that can be administered with certainty and precision. I think that is what the American people expect that we do. ¹⁵

There are innumerable references in the legislative history to the effect that the Act is founded on the “basic premise that a discharge of pollutants without a permit is unlawful and that discharges not in compliance with the limitations and conditions for a permit are unlawful.” ¹⁶ Even when infeasibility arguments were squarely raised, *1376 **154 the legislature declined to abandon the permit requirement. ¹⁷ We stand by our previous interpretation of the Act's scheme for the enforcement of effluent limitations:

After dates set forth in (s 301(b)), a person must obtain a permit and comply with its terms in order to discharge any pollutant. The conditions of the permit must assure that any discharge complies with the applicable requirements of numerous sections including the effluent limitations of section 301(b).

[NRDC v. Train, 166 U.S.App.D.C. at 316, 510 F.2d at 696](#) (emphasis added; footnotes omitted).

We also note that all the Supreme Court decisions referring to s 402 view the permit as the only means by which a point source polluter can avoid the ban on discharges found in s 301. Strictly speaking these expressions may be dicta, for they do not touch directly on the interpretation of s 402. But they are at least a considered reading of what the Act appears to mean.

In [Train v. Colorado Public Interest Research Group, Inc., 426 U.S. 1, 96 S.Ct. 1938, 48 L.Ed.2d 434 \(1976\)](#), Justice Marshall characterized the enforcement scheme of the FWPCA as follows:

(E)ffluent limitations are enforced through a permit program. The discharge of “pollutants” into water is unlawful without a permit issued by the Administrator of the EPA or, if a State has developed a program that complies with the FWPCA, by the State. . . .

[Id. at 7, 96 S.Ct. at 1941](#) (footnote omitted).

In [EPA v. State Water Resources Control Board, 426 U.S. 200, 96 S.Ct. 2022, 48 L.Ed.2d 578 \(1976\)](#), the issue was whether federal installations were subject to state NPDES programs. Justice White's majority opinion describes NPDES at 205, [96 S.Ct. at 2025](#) (footnote omitted):

Under NPDES, it is unlawful for any person to discharge a pollutant without obtaining a permit and complying with its terms. An NPDES permit serves to transform generally applicable effluent limitations and other standards including those based on water quality into the obligations (including a timetable for compliance) of the individual discharger, and the Amendments provide for direct administrative and judicial enforcement of permits.

In *E. I. du Pont de Nemours v. Train*, 430 U.S. 112, 97 S.Ct. 965, 51 L.Ed.2d 204 (1977), the Court held that under FWPCA the EPA can set uniform effluent limitations through industry-wide regulations rather than develop them on an individual basis during the permit issuance process. But the Court, per Justice Stevens, clearly indicated *1377 **155 that those limitations were translated into obligations of the discharger through their inclusion in an NPDES permit. *Id.* at 119-20, 97 S.Ct. 965.

The wording of the statute, legislative history, and precedents are clear: the EPA Administrator does not have authority to exempt categories of point sources from the permit requirements of s 402. Courts may not manufacture for an agency a revisory power inconsistent with the clear intent of the relevant statute. In holding that the FPC does not have authority to exempt the rates of small producers from regulation under the Natural Gas Act, the Supreme Court observed:

It is not the Court's role . . . to overturn congressional assumptions embedded into the framework of regulation established by the Act. This is a proper task for the Legislature where the public interest may be considered from the multifaceted points of view of the representational process.

FPC v. Texaco, Inc., 417 U.S. 380, 400, 94 S.Ct. 2315, 2327, 41 L.Ed.2d 141 (1974).

II. ADMINISTRATIVE INFEASIBILITY

The appellants have stressed in briefs and at oral argument the extraordinary burden on the EPA that will be imposed by the above interpretation of the scope of the NPDES program. The spectre of millions of applications for permits is evoked both as part of appellants' legislative history argument that Congress could not have intended to impose such burdens on the EPA and as an invitation to this court to uphold the regulations as deviations from the literal terms of the FWPCA necessary to permit the agency to realize the general objectives of that act. During oral argument we asked for supplemental briefs so that the appellants could expand on their infeasibility arguments. We consider EPA's infeasibility contentions in turn.

A. Uniform National Effluent Limitations

EPA argues that the regulatory scheme intended under Titles III and IV of the FWPCA requires, first, that the Administrator establish national effluent limitations¹⁸ and, second, that these limitations be incorporated in the individual permits of dischargers. EPA argues that the establishment of such limitations is simply not possible with the type of point sources involved in the 1973 regulations, which essentially involve the discharge of runoff i. e., wastewaters generated by rainfall that drain over terrain into navigable waters, picking up pollutants along the way.

There is an initial question, to what extent point sources are involved in agricultural, silvicultural, and storm sewer runoff. The definition of point source in s 502(14), including the concept of a "discrete conveyance", suggests that there is room here for some exclusion by interpretation. We discuss this issue subsequently. Meanwhile, we assume that even taking into account what are clearly point sources, there is a problem of infeasibility which the EPA properly opens for discussion.

EPA contends that certain characteristics of runoff pollution make it difficult to promulgate effluent limitations for most of the point sources exempted by the 1973 regulations:

The major characteristic of the pollution problem which is generated by runoff . . . is that the owner of the discharge point . . . has no control over the quantity of the flow or the nature and amounts of the pollutants picked up by the runoff. The amount of flow obviously is unpredictable because it results from the duration and intensity of the rainfall event, the topography, the type of ground cover and the saturation point of the land due to any previous *1378 **156 rainfall. Similar factors affect the types of pollutants which will be picked up by that runoff, including the type of farming practices employed, the rate and type of pesticide and fertilizer application, and the conservation practices employed . . .

An effluent limitation must be a precise number in order for it to be an effective regulatory tool; both the discharger and the regulatory agency need to have an identifiable standard upon which to determine whether the facility is in compliance. That was the principal of the passage of the 1972 Amendments.

Federal Appellants' Memorandum on "Impossibility" at 7-8 (footnote omitted). Implicit in EPA's contentions is the premise that there must be a uniform effluent limitation prior to issuing a permit. That is not our understanding of the law.

In *NRDC v. Train*, we described the interrelationship of the effluent limitations and the NPDES permit program, [166 U.S.App.D.C. at 327, 510 F.2d at 707](#) (footnotes omitted):

The Act relies on effluent limitations on individual point sources as the "basis of pollution prevention and elimination." . . . Section 301(b) contains a broad description of phase one and phase two effluent limitations, to be achieved by July 1, 1977 and July 1, 1983, respectively. The limitations established under section 301(b) are to be imposed upon individual point sources through permits issued under the National Pollutant Discharge Elimination System (NPDES) established by section 402. Those permits are to contain schedules which will assure phased compliance with the effluent limitations no later than the final dates set forth in section 301(b). Section 304(b) calls for the publication of regulations containing guidelines for effluent limitations for classes and categories of point sources. These guidelines are intended to assist in the establishment of section 301(b) limitations that will provide uniformity in the permit conditions imposed on similar sources within the same category by diverse state and federal permit authorities.

As noted in *NRDC v. Train*, the primary purpose of the effluent limitations and guidelines was to provide uniformity among the federal and state jurisdictions enforcing the NPDES program and prevent the "Tragedy of the Commons"¹⁹ that might result if jurisdictions can compete for industry and development by providing more liberal limitations than their neighboring states. [166 U.S.App.D.C. at 329, 510 F.2d at 709](#). The effluent limitations were intended to create floors that had to be respected by state permit programs.

But in *NRDC v. Train* it was also recognized that permits could be issued before national effluent limitations were promulgated and that permits issued subsequent to promulgation of uniform effluent limitations could be modified to take account of special characteristics of subcategories of point sources.

Prior to the promulgation of effluent limitations under section 301, the director of a state program is instructed merely to impose such terms and conditions in each permit as he determines are necessary to carry out the provisions of the Act. Once ***1379 **157** an effluent limitation is established, however, the state director and the regional EPA Administrator are required to apply the specified, uniform effluent limitations, modified only as necessary to take account of fundamentally different factors pertaining to particular point sources within a given class or category. Any variation in the uniform limitations adopted for specific dischargers must be approved by the Administrator.

[166 U.S.App.D.C. at 330, 510 F.2d at 710](#) (footnotes omitted).

Another passage in *NRDC v. Train* touches on the infeasibility problem. We noted that "(t)he statutory framework is not so tightly drawn as to require guidelines for each and every class and category of point source regardless of the need for uniform guidelines or to mandate that all guidelines be published prior to December 31 (1974) regardless of their quality or the burden that task would place upon the agency." *Id.* at 320-21, [510 F.2d at 710-11](#). In that case this court fully appreciated that technological and administrative constraints might prevent the Administrator from developing guidelines and corresponding uniform numeric effluent limitations for certain point sources anytime in the near future. The Administrator was deemed to have the burden of demonstrating that the failure to develop the guidelines on schedule

was due to administrative or technological infeasibility. 166 U.S.App.D.C. at 333, 510 F.2d at 713. Yet the underlying teaching was that technological or administrative infeasibility was a reason for adjusting court mandates to the minimum extent necessary to realize the general objectives of the Act.²⁰ It is a number of steps again to suggest that these problems afford the Administrator the authority to exempt categories of point sources from the NPDES program entirely.

With time, experience, and technological development, more point sources in the categories that EPA has now classed as exempt may be amenable to national effluent limitations achieved through end-of-pipe technology or other means of pollution control. EPA has noted its own success with runoff from mining operations:

EPA has found that in the area of runoff from mining operations, there is sufficient predictability because of a longer history of regulation and the relatively confined nature of the operations that numerical limitations can be established. Thus, consistent with EPA's position stated earlier that it will expand the permit program where its capability of establishing effluent limitations allows, appropriate limitations have been created and the permit program expanded.

Federal Appellants' Memorandum on "Impossibility" at 8.

[3] In sum, we conclude that the existence of uniform national effluent limitations is not a necessary precondition for incorporating into the NPDES program pollution from agricultural, silvicultural, and storm water runoff point sources. The technological or administrative infeasibility of such limitations may result in adjustments in the permit programs, as will be seen, but it does not authorize the Administrator to exclude the relevant point source from the NPDES program.

B. Alternative Permit Conditions under s 402(a)

EPA contends that even if it is possible to issue permits without national effluent limitations, *1380 **158 the special characteristics of point sources of runoff pollution make it infeasible to develop restrictions on a case-by-case basis. EPA's implicit premise is that whether limitations are promulgated on a class or individual source basis, it is still necessary to articulate any limitation in terms of a numerical effluent standard. That is not our understanding.

[4] Section 402 provides that a permit may be issued upon condition "that such discharge will meet either all applicable requirements under sections 301, 302, 306, 307, 308 and 403 of this Act, or prior to taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this Act." 33 U.S.C. s 1342(a) (Supp. V 1975) (emphasis added). This provision gives EPA considerable flexibility in framing the permit to achieve a desired reduction in pollutant discharges. The permit may proscribe industry practices that aggravate the problem of point source pollution.²¹

EPA's counsel caricatures the matter by stating that recognition of any such authority would give EPA the power "to instruct each individual farmer on his farming practices." Federal Appellants Memorandum on "Impossibility" at 12. Any limitation on a polluter forces him to modify his conduct and operations. For example, an air polluter may have a choice of installing scrubbers, burning different fuels or reducing output. Indeed, the authority to prescribe limits consistent with the best practicable technology may be tantamount to prescribing that technology. Of course, when alternative techniques are available, Congress intended to give the discharger as much flexibility as possible in choosing his mode of compliance. See, e. g., H.Rep.No.92-911, 92d Cong., 2d Sess. 107, reprinted in Legislative History at 794. We only indicate here that when numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels. This may well mean opting for a gross reduction in pollutant discharge rather than the fine-tuning suggested by numerical limitations. But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.

It may be appropriate in certain circumstances for the EPA to require a permittee simply to monitor and report effluent levels; EPA manifestly has this authority.²² Such permit conditions might be desirable where the full extent of the pollution problem is not known.

C. General Permits

Finally, EPA argues that the number of permits involved in the absence of an exemption authority will simply overwhelm the Agency. Affidavits filed with the District Court indicate, for example, that the number of silviculture point sources may be over 300,000 and that there are approximately 100,000 separate storm sewer point sources.²³ We are and must be sensitive to *1381 **159 EPA's concerns of an intolerable permit load. But the District Court and the various parties have suggested devices to mitigate the burden to accommodate within a practical regulatory scheme Congress's clear mandate that all point sources have permits. All that is required is that EPA makes full use of its interpretational authority. The existence of a variety of options belies EPA's infeasibility arguments.

[5] Section 402 does not explicitly describe the necessary scope of a NPDES permit. The most significant requirement is that the permit be in compliance with limitation sections of the Act described above. As a result NRDC and the District Court have suggested the use of area or general permits. The Act allows such techniques. Area-wide regulation is one well-established means of coping with administrative exigency. An instance is area pricing for natural gas producers, which the Supreme Court upheld in *Permian Basin Area Rate Cases*, 390 U.S. 747, 88 S.Ct. 1344, 20 L.Ed.2d 312 (1968).²⁴ A more dramatic example is the administrative search warrant, which may be issued on an area basis despite the normal Fourth Amendment requirement of probable cause for searching specific premises. *Camara v. Municipal Court*, 387 U.S. 523, 87 S.Ct. 1727, 18 L.Ed.2d 930 (1967).

In response to the District Court's order, EPA promulgated regulations that make use of the general permit device. 42 Fed.Reg. 6846-53 (Feb. 4, 1977). The general permit is addressed to a class of point source dischargers, subject to notice and opportunity for public hearing in the geographical area covered by the permit. Although we do not pass on the validity of the February, 1977, regulations, they serve to dilute an objection of wholesale infeasibility.²⁵

Our approach is not fairly subject to the criticism that it elevates form over substance that the end result will look very much like EPA's categorical exemption. It is the function of the courts to require agencies to comply with legislative intent when that intent is clear, and to leave it to the legislature to make adjustments when the result is counterproductive.²⁶ At the same time, where intent on an issue is unclear, *1382 **160 we are instructed to afford the administering agency the flexibility necessary to achieve the general objectives of the Act. *Weinberger v. Bentex Pharmaceuticals, Inc.*, 412 U.S. 645, 653, 93 S.Ct. 2448, 37 L.Ed.2d 235 (1973); *United States v. Southwestern Cable Co.*, 392 U.S. 157, 177-78, 88 S.Ct. 1994, 20 L.Ed.2d 1001 (1968); *Permian Basin Area Rate Cases*, 390 U.S. 747, 780, 88 S.Ct. 1344, 20 L.Ed.2d 312 (1968). These lines of authority conjoin in our approach. We insist, as the Act insists, that a permit is necessary; the Administrator has no authority to exempt point sources from the NPDES program. But we concede necessary flexibility in the shaping of the permits that is not inconsistent with the clear terms of the Act.

There is also a very practical difference between a general permit and an exemption. An exemption tends to become indefinite: the problem drops out of sight, into a pool of inertia, unlikely to be recalled in the absence of crisis or a strong political protagonist. In contrast, the general or area permit approach forces the Agency to focus on the problems of specific regions and requires that the problems of the region be reconsidered at least every five years, the maximum duration of a permit.²⁷

D. Other Interpretational Powers

[6] Many of the intervenor-appellants appear to argue that the District Court should be reversed because the categories exempted by EPA are nonpoint sources and are not, in fact, point sources.²⁸ We agree with the District Court "that the

power to define point and nonpoint sources is vested in EPA and should be reviewed by the court only after opportunity for full agency review and examination.” 396 F.Supp. at 1396. The only issue precisely confronted by all the parties and properly framed for our consideration is whether the Administrator has authority to exempt point sources from the NPDES program. We also think that we should, for similar reasons, not consider at this time the appropriate definition of “discharge of any pollutant” as used in s 402. The American Iron and Steel Institute as amicus curiae has pressed upon us the argument that the term “discharge” as used in s 402 was intended to encompass only “volitional flows” that add pollutants to navigable waters. Most forms of runoff, it is argued, do not involve volitional flows.

[7] We assume that FWPCA, however tight in some respects, leaves some leeway to EPA in the interpretation of that statute, and in that regard affords the Agency some means to consider matters of feasibility. However, for reasons already noted, we do not consider these particular contentions as to interpretation on the merits.

III. CONCLUSION

[8] As the Supreme Court recently stated in a FWPCA case, “(t)he question . . . is ****161 *1383** not what a court thinks is generally appropriate to the regulatory process, it is what Congress intended . . .” *E. I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 138, 97 S.Ct. 965, 980, 51 L.Ed.2d 204 (1977). We find a plain Congressional intent to require permits in any situation of pollution from point sources. We also discern an intent to give EPA flexibility in the structure of the permits, in the form of general or area permits. We are aware that Congress hoped that more of the NPDES permit program would be administered by the states at this point.²⁹ But it also made provision for continuing EPA administration. Imagination conjoined with determination will likely give EPA a capability for practicable administration. If not, the remedy lies with Congress.

So ordered.

MacKINNON, Circuit Judge, concurring:

I concur in the very sound and practical construction set forth in the foregoing opinion. Any person concerned with the actual application and enforcement of laws would necessarily be concerned by the application of the relevant legislation to all point sources in agriculture and particularly to irrigated agriculture. Concern would also lie in the congressional admission that present technology is inadequate to enable our citizens to meet the standards and deadlines the Act imposes; in passing the law, Congress was relying on the future “invention (of) new and imaginative developments that will allow us to meet the objectives of our bill.”¹ In gambling parlance, Congress in enacting the law was “betting on the come.” It is relying on our citizens in the near future to develop the complex technology to meet all the law's standards and objectives on time. The difficulty with that approach is that the hopes of Congress in this respect, like that of any gambler, might not be realized. The agency in this case, however, has shown that it takes a realistic view of both the situation and the task of meeting the difficult requirements and objectives of the Act. I sincerely hope that the ability of the agency to issue section 402 permits including general area permits² will permit it to meet the present and future compliance problems posed by the Act in a practical way.

All Citations

568 F.2d 1369, 10 ERC 2025, 186 U.S.App.D.C. 147, 8 Env'tl. L. Rep. 20,028

Footnotes

* For convenience the court will refer to this case hereafter as NRDC v. Costle (Runoff Point Sources).

- 1 33 U.S.C. ss 1251-1376 (Supp. V 1975). Although characterized in the official title as “amendments”, the 1972 FWPCA actually
substitutes its provisions for those of the pre-1972 Federal Water Pollution Control Act as amended, id. ss 1151-1175 (1970).
- 2 This case deals with s 402 of the FWPCA, 33 U.S.C. s 1342 (Supp. V 1975), which sets out the permitting authority of the
EPA Administrator as well as that of the states under EPA-approved state permit programs. The Secretary of the Army also
has a permitting authority in certain circumstances. Under s 404 of the FWPCA, 33 U.S.C. s 1344 (Supp. V 1975), he may
issue permits for the discharge of dredged or fill material into navigable waters.
- 3 40 C.F.R. s 125.4 (1975). See 38 Fed.Reg. 18000-04 (1973).
- 4 33 U.S.C. s 1362(14) (Supp. V 1975).
- 5 40 C.F.R. s 125.4 (1975):
The following do not require an NPDES permit:
(f) Uncontrolled discharges composed entirely of storm runoff when these discharges are uncontaminated by any industrial
or commercial activity, unless the particular storm runoff discharge has been identified by the Regional Administrator, the
State water pollution control agency or an interstate agency as a significant contributor of pollution. (It is anticipated that
significant contributors of pollution will be identified in connection with the development of plans pursuant to section 303(e)
of the Act. This exclusion applies only to separate storm sewers. Discharges from combined sewers and bypass sewers are
not excluded.)
(j) Discharges of pollutants from agricultural and silvicultural activities, including irrigation return flow and runoff from
orchards, cultivated crops, pastures, rangelands, and forest lands, except that this exclusion shall not apply to the following:
(1) Discharges from animal confinement facilities, if such facility or facilities contain, or at any time during the previous 12
months contained, for a total of 30 days or more, any of the following types of animals at or in excess of the number listed
for each type of animal:
(i) 1,000 slaughter and feeder cattle;
(ii) 700 mature dairy cattle (whether milkers or dry cows);
(iii) 2,500 swine weighing over 55 pounds;
(iv) 10,000 sheep;
(v) 55,000 turkeys;
(vi) If the animal confinement facility has continuous overflow watering, 100,000 laying hens and broilers;
(vii) If the animal confinement facility has liquid manure handling systems, 30,000 laying hens and broilers;
(viii) 5,000 ducks;
(2) Discharges from animal confinement facilities, if such facility or facilities contain, or any time during the previous 12
months contained for a total of 30 days or more, a combination of animals such that the sum of the following numbers is
1,000 or greater: the number of slaughter and feeder cattle multiplied by 1.0, plus the number of mature dairy cattle multiplied
by 1.4, plus the number of swine weighing over 55 pounds multiplied by 0.4, plus the number of sheep multiplied by 0.1;
(3) Discharges from aquatic animal production facilities;
(4) Discharges of irrigation return flow (such as tailwater, tile drainage, surfaced ground water flow or bypass water), operated
by public or private organizations or individuals, if: (1) There is a point source of discharge (e. g., a pipe, ditch, or other defined
or discrete conveyance, whether natural or artificial) and; (2) the return flow is from land areas of more than 3,000 contiguous
acres, or 3,000 non-contiguous acres which use the same drainage system; and
(5) Discharges from any agricultural or silvicultural activity which have been identified by the Regional Administrator or the
Director of the State water pollution control agency or interstate agency as a significant contributor of pollution.
- 6 Briefs as amicus curiae were filed by the American Iron and Steel Institute, the State of Texas, and the State of Washington,
Department of Natural Resources.
- 7 33 U.S.C. s 1251(a) (Supp. V 1975).
- 8 33 U.S.C. s 1311(b)(1)(A) (Supp. V 1975).
- 9 Id. s 1311(b)(2)(A).
- 10 Id. s 1311(a).
- 11 Section 302, 33 U.S.C. s 1312 (Supp. V 1975), permits the Administrator to set water quality related effluent limitations or
control strategies where technology-based limitations are inadequate. Section 306, 33 U.S.C. s 1316 (Supp. V 1975), instructs
the EPA Administrator to promulgate standards of performance for new sources of pollution constructed after those standards
are proposed. Section 307, 33 U.S.C. s 1317 (Supp. V 1975), gives the EPA Administrator the authority to issue generally
applicable effluent standards with respect to toxic substances and to require pretreatment of some pollutants before their
introduction into treatment works. By virtue of s 318, 33 U.S.C. s 1328 (Supp. V 1975), the Administrator may “permit the
discharge of a specific pollutant or pollutants under controlled conditions associated with an approved aquaculture project

under Federal or State supervision.” Section 404, [33 U.S.C. s 1344 \(Supp. V 1975\)](#), gives the Secretary of the Army authority to issue permits for the discharge of dredged or fill material into the navigable waters at specified disposal sites.

12 “The Administrator of the Environmental Protection Agency is authorized to regulate discharge of pollutants through the use of an expanded permit program.” 117 Cong.Rec. 38800 (1971) (Senator Muskie) (emphasis added), reprinted in 2 Environmental Policy Div., Congressional Reference Serv., A Legislative History of the Water Pollution Control Act Amendments of 1972, at 1259 (Senate Public Works Comm. Print 1973) (hereinafter cited as Legislative History).

13 H.Rep.No.92-911, 92d Cong., 2d Sess. 100 (1972), reprinted in Legislative History at 787.

14 [S.Rep.No.92-414](#), 92d Cong., 1st Sess. 42 (1971), reprinted in Legislative History at 1460; U.S.Code Cong. & Admin.News 1972, pp. 3668, 3709.

15 117 Cong.Rec. 38805 (1971), reprinted in Legislative History at 1272. See also the comments of Senator Montoya on the original Senate bill.

Your committee has placed before you a tough bill. This body and this Nation would not have it be otherwise. Our legislation contains an important principle of psychology: Men seldom draw the best from themselves unless pressed by circumstances and deadlines. This bill contains deadlines and it imposes rather tough standards on industry, municipalities, and all other sources of pollution. Only under such conditions are we likely to press the technological threshold of invention into new and imaginative developments that will allow us to meet the objectives stated in our bill.

117 Cong.Rec. 38808 (1971), reprinted in Legislative History at 1278.

16 118 Cong.Rec. 10215 (1972) (Rep. Clausen), reprinted in Legislative History at 378. See, e. g., H.R.Rep.No.92-911 92d Cong., 2d Sess. 100 (1972), reprinted in Legislative History at 787; [S.Rep.No.92-414](#); 92d Cong., 1st Sess. 42-43 (1971), reprinted in Legislative History at 1460-61; 118 Cong.Rec. 10661 (1972) (Rep. Podell), reprinted in Legislative History at 574.

17 The House rejected an amendment designed to avoid the problems of including irrigation return flows in the permit program. Congressman Teno Roncalio of Wyoming offered an amendment on the floor of the House that would have explicitly exempted irrigated agriculture from the NPDES permit program.

Mr. RONCALIO. . . .

I offer my amendment so that a serious omission to H.R. 11896 can be corrected before we end up with a law that would be virtually impossible to enforce. My amendment would specifically exempt irrigated agriculture from sections 301(a), 302 and 304 of the Federal Water Pollution Control Act.

I think my colleagues will agree that the type of salinity problems created by irrigation runoff are simply not as alarming as the more common pollutants discharged by industrial and municipal facilities. Substantial salinity concentrations have little effect on recreational use of water or its suitability for the propagation of fish.

My amendment is necessary, Mr. Chairman, because at the present time we could not enforce pollution control on irrigation systems. It is virtually impossible to trace pollutants to specific irrigation lands, making these pollutants a nonpoint source in most cases. Second, we do not have the technology to deal with irrigation runoff (as contrasted to industrial pollution) and if we begin making laws to control something that cannot be handled with our given technological knowledge, we will be doing many thousand farmers and ranchers a great disservice. In fact, we will be doing the Federal Government a great disservice if we actually pass a Federal water pollution control bill that cannot be fully enforced.

118 Cong.Rec. 10764-65 (1972), reprinted in Legislative History at 651. The amendment was rejected.

18 See FWPCA [s 502\(11\)](#), [33 U.S.C. s 1362\(11\)](#) (Supp. V 1975):

The term “effluent limitation” means any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance.

19 As one commentator has recently written:

The Tragedy of the Commons arises in noncentralized decisionmaking under conditions in which the rational but independent pursuit by each decisionmaker of its own self-interest leads to results that leave all decisionmakers worse off than they would have had they been able to agree collectively on a different set of policies.

Stewart, [Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy](#), 86 *Yale L.J.* 1196, 1211 (1977). The classic account of the Tragedy of the Commons can be found in Hardin, *The Tragedy of the Commons*, 162 *Science* 1243 (1968). Hardin makes the point in the context of sheep-grazing. Put simply, even over-simply, Hardin shows that if no one is authorized to set limits to preserve open pasture land as a whole, allowing sheep to graze on that land may lead to serious overgrazing, as each herdsman thinks only of his own advantage. The solution lies in some mandate, from above or by agreement, with sanctions to compel conformance.

20 In *NRDC v. Train*, this court stated:

A federal equity court may exercise its discretion to give or withhold its mandate in furtherance of the public interest, including specifically the interest in effectuating the congressional objective incorporated in regulatory legislation. We think the court may forebear the issuance of an order in those cases where it is convinced by the official involved that he has in good faith employed the utmost diligence in discharging his statutory responsibilities. The sound discretion of an equity court does not embrace enforcement through contempt of a party's duty to comply with an order that calls him "to do an impossibility."

166 U.S.App.D.C. at 333, 510 F.2d at 713 (footnotes omitted). For reasons stated in this opinion, we conclude that to require the EPA Administrator to include silvicultural, agricultural, and storm sewer point sources in the NPDES program is not to require him "to do an impossibility."

21 That Congress did not regard numeric effluent limitations as the only permissible limitation on a discharger is supported by s 302(a) of the Act, 33 U.S.C. s 1312(a) (Supp. V 1975):

Whenever, in the judgment of the Administrator, discharges of pollutants from a point source or group of point sources, with the application of effluent limitations required under (s 301(b) of the Act), would interfere with the attainment or maintenance of that water quality in a specific portion of the navigable waters which shall assure protection of public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water, effluent limitations (including alternative effluent control strategies) for such point source or sources shall be established which can reasonably be expected to contribute to the attainment or maintenance of such water quality.

The emphasis has been added.

22 FWPCA s 402(a)(3), (b)(2)(B), 33 U.S.C. s 1342(a)(3), (b)(2)(B) (Supp. V 1975). EPA concedes that it has this authority. Federal Appellants' Memorandum on "Impossibility" at 14.

23 Affidavit of William H. McCredie, Director, Industrial Forestry, of the NFPA; Affidavit of Walter G. Gilbert, Chief of the Municipal Operations Branch, Municipal Waste Water Systems Div., EPA Office of Air and Water Programs.

24 In Permian Basin the Supreme Court observed:

The Commission has asserted, and the history of producer regulation has confirmed, that the ultimate achievement of the Commission's regulatory purposes may easily depend upon the contrivance of more expeditious administrative methods. The Commission believes that the elements of such methods may be found in area proceedings. "(C)onsiderations of feasibility and practicality are certainly germane" to the issues before us. . . . We cannot, in these circumstances, conclude that Congress has given authority inadequate to achieve with reasonable effectiveness the purposes for which it has acted.

390 U.S. at 777, 88 S.Ct. at 1365.

25 It is also of some, albeit limited, significance that the House Committee on Government Operations found EPA's administrative problems with applying the permit program to animal feedlots "grossly exaggerated." It was of the opinion that the Administrator did not have authority to exempt point sources from the NPDES program. H.Rep.No.93-1012, 93d Cong., 2d Sess. 15-30 (1974).

26 The Supreme Court recently reiterated this instruction in [Union Electric Co. v. EPA](#), 427 U.S. 246, 96 S.Ct. 2518, 49 L.Ed.2d 474 (1976). There the Court held that the EPA Administrator could not consider claims of technological or economic infeasibility when approving state implementation plans under the Clean Air Act Amendments of 1970, 42 U.S.C. ss 1857a-1857I (1970). Such claims were held only to be cognizable by the states in the plan design stage or by the Administrator when drawing up compliance orders. Justice Marshall, writing for the Court, emphasized that federal courts are not to ignore clear expressions of Congressional intent in order to accommodate claims of technological or economic infeasibility.

Allowing such claims to be raised by appealing the Administrator's approval of an implementation plan . . . would frustrate congressional intent. It would permit a proposed plan to be struck down as infeasible before it is given a chance to work, even though Congress clearly contemplated that some plans would be infeasible when proposed. And it would permit the Administrator or a federal court to reject a State's legislative choices in regulating air pollution, even though Congress plainly left with the States, so long as the national standards were met, the power to determine which sources would be burdened by regulation and to what extent. Technology forcing is a concept somewhat new to our national experience and it necessarily entails certain risks. But Congress considered those risks in passing the 1970 Amendments and decided that the dangers posed by uncontrolled air pollution made them worth taking. Petitioner's theory would render that considered legislative judgment a nullity, and that is a result we refuse to reach.

427 U.S. at 268-69, 96 S.Ct. at 2531 (footnote omitted). See also [Wilderness Society v. Morton](#), 156 U.S.App.D.C. 121, 171, 479 F.2d 842, 892 (1973), cert. denied, 411 U.S. 917, 93 S.Ct. 1550, 36 L.Ed.2d 309 (quoting [United States v. City and County of San Francisco](#), 310 U.S. 16, 31-32, 60 S.Ct. 749, 84 L.Ed. 1050 (1940): "We cannot accept the contention that administrative rulings such as those relied on can thwart the plain purpose of a valid law.' ")

27 33 U.S.C. s 1342(a)(3), (b)(1)(B) (Supp. V 1975).

- 28 This appears to be the position of the Colorado River Water Conservation District and the NFPA with respect to silvicultural activities, and NMPF, less obviously, with respect to small dairy farms.
We would put in the same category EPA's contention that the exempt categories are best handled under the areawide waste treatment management planning process of s 208 of the FWPCA, 33 U.S.C. s 1288 (Supp. V 1975). By its terms that section is concerned with areawide waste treatment plans that identify and control "agriculturally and silviculturally related non-point sources of pollution." *Id.* s 1288(b)(2)(F).
- 29 See, e. g., 118 Cong.Rec. 10235 (1972) (Rep. Ichord) reprinted in Legislative History at 428.
- 1 Comments of Senator Montoya, 117 Cong.Rec. 38808 (1971), quoted in court's opinion at 12, reprinted in Legislative History at 1278.
- 2 As an example, an area permit with appropriate conditions and modifications could issue for the agricultural point sources within the Grand River Irrigation District, or the watershed of the Roaring Fork River and tributaries, etc.

ATTACHMENT 20

 KeyCite Yellow Flag - Negative Treatment

Distinguished by [Northwest Environmental Advocates v. U.S. E.P.A.](#), N.D.Cal., March 30, 2005

966 F.2d 1292

United States Court of Appeals,
Ninth Circuit.

NATURAL RESOURCES DEFENSE COUNCIL, INC., Petitioner,

v.

[UNITED STATES ENVIRONMENTAL PROTECTION AGENCY](#), Respondent,
[Battery Council International](#), et al., Respondents–Intervenors.

Nos. 90–70671, 91–70200.

|
Argued and Submitted Oct. 9, 1991.

|
Decided June 4, 1992.

Environmental group sought review of Environmental Protection Agency's (EPA's) Clean Water Act storm water discharge rule. The Court of Appeals, [Ferguson](#), Senior Circuit Judge, held that: (1) the EPA's failure to include deadlines for permit approval or denial and compliance consistent with Clean Water Act was arbitrary and capricious, although injunctive relief was not warranted; (2) EPA's definition of municipal separate storm sewer serving a population was not arbitrary and capricious; and (3) EPA rule excluding various types of light industry and construction sites of less than five acres from application of rule was arbitrary and capricious.

Petition for review granted in part and denied in part.

[O'Scannlain](#), Circuit Judge, filed an opinion concurring in part and dissenting in part.

West Headnotes (15)

[1] Declaratory Judgment  Federal officers and boards

Question of whether Environmental Protection Agency (EPA) is bound by statutory scheme set by Congress is legal one, and, thus, request for declaratory relief from EPA's failure to issue storm water permitting regulations by particular date was ripe for consideration by court. Federal Water Pollution Control Act Amendments of 1972, §§ 101–606, 101(a), 402(l, p), 502(14), as amended, 33 U.S.C.A. §§ 1251–1387, 1251(a), 1342(l, p), 1362(14).

[8 Cases that cite this headnote](#)

[2] Declaratory Judgment  Necessity, utility and propriety

Declaratory Judgment  Termination or settlement of controversy

For purposes of granting declaratory relief, court considers whether judgment will clarify and settle legal relations at issue and whether it will afford relief from uncertainty and controversy giving rise to proceedings.

[19 Cases that cite this headnote](#)

[3] Environmental Law 🔑 Regulations and rulemaking in general

Environmental Protection Agency (EPA) lacks authority to ignore unambiguous deadlines set by Congress for issuing regulations.

[1 Cases that cite this headnote](#)

[4] Injunction 🔑 Ease or difficulty of enforcement

Injunctive relief may be inappropriate if it requires constant supervision by the court.

[16 Cases that cite this headnote](#)

[5] Environmental Law 🔑 Injunction

Court of Appeals would not enjoin Environmental Protection Agency (EPA) from further extensions of deadline for permit applications for municipal and industrial discharges as to do so would require extensive supervision of EPA by Court; Court would operate on assumption that EPA would follow dictates of Congress and Court.

[3 Cases that cite this headnote](#)

[6] Environmental Law 🔑 Discharge of pollutants

Environmental Protection Agency's (EPA's) failure to include final approval and compliance deadlines for permit applications for storm water discharges associated with industrial activities in large municipalities was arbitrary and capricious exercise of its responsibility to issue regulations pursuant to Clean Water Act. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(4)(A, B), as amended, [33 U.S.C.A. § 1342\(p\)\(4\)\(A, B\)](#).

[6 Cases that cite this headnote](#)

[7] Environmental Law 🔑 Discharge of pollutants

Even if Environmental Protection Agency (EPA) was failing to proceed so that regulations for approval and compliance with permit applications for storm water discharges would be in place for small systems by deadline in Clean Water Act, small systems could not be put on same schedule as medium ones, as Clean Water Act did not require regulation of small systems prior to expiration of moratorium. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(1), (p)(4)(A, B), (p)(6), as amended, [33 U.S.C.A. § 1342\(p\)\(1\), \(p\)\(4\)\(A, B\), \(p\)\(6\)](#).

[Cases that cite this headnote](#)

[8] Environmental Law 🔑 Discharge of pollutants

Despite Environmental Protection Agency's (EPA's) unlawful delay in establishing comprehensive program for permit approval and compliance with Clean Water Act storm water discharge rule, EPA's schedule calling for immediate municipal system applications due six months after applications for large municipal systems was within statutory scheme in its relation to schedule for large systems and was not unreasonable. Federal Water Pollution Control Act Amendments of 1972, § 402(p), (p)(2)(C, D), (p)(4)(B), as amended, [33 U.S.C.A. § 1342\(p\), \(p\)\(2\)\(C, D\), \(p\)\(4\)\(B\)](#).

[Cases that cite this headnote](#)

[9] [Environmental Law](#) 🔑 [Sewage and sewers](#)

Environmental Protection Agency's (EPA's) definition of phrase “municipal separate store sewer system serving a population” in regulations for implementing the Clean Water Act storm water discharge rule, while complex and possibly convoluted, was not arbitrary and capricious; EPA defined phrase by considering factors such as its own workload, the incorporation status of municipalities, and urban density. Federal Water Pollution Control Act Amendments of 1972, §§ 402(p)(2), 502, 502(4), as amended, 33 U.S.C.A. §§ 1342(p)(2), 1362, 1362(4).

[15 Cases that cite this headnote](#)

[10] [Environmental Law](#) 🔑 [Substances, Sources, and Activities Regulated](#)

Environmental Protection Agency's (EPA's) rules excluding various types of light industry and construction sites of less than five acres from application of Clean Water Act storm water discharge rule were arbitrary and capricious absent support in record for assumption that industrial activity or light industry would take place indoors and generate minimal amounts of particles and emissions. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(2)(B), as amended, 33 U.S.C.A. § 1342(p)(2)(B).

[7 Cases that cite this headnote](#)

[11] [Environmental Law](#) 🔑 [Substances, Sources, and Activities Regulated](#)

Environmental Protection Agency's (EPA's) exemption from Clean Water Act storm water discharge rule for construction sites of less than five acres, as increased from original proposal of exemption for sites of less than one acre, was arbitrary and capricious absent support in record for EPA's perception that construction activities on less than five acres were nonindustrial in nature. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(2)(B), as amended, 33 U.S.C.A. § 1342(p)(2)(B).

[8 Cases that cite this headnote](#)

[12] [Environmental Law](#) 🔑 [Substances, Sources, and Activities Regulated](#)

For purposes of setting rules for application of storm water discharge regulations in Clean Water Act, EPA lacked agency power to make categorical exemptions where result was de minimis. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(2)(B), as amended, 33 U.S.C.A. § 1342(p)(2)(B).

[7 Cases that cite this headnote](#)

[13] [Environmental Law](#) 🔑 [Sewage and sewers](#)

Environmental Protection Agency's (EPA's) exemption from permit requirements under Clean Water Act storm water discharge rule for uncontaminated runoff from mining, oil, and gas facilities was not arbitrary and capricious; conference report gave administrator discretion to determine when contamination had occurred with respect to overburden, raw materials, waste products, and other items. Federal Water Pollution Control Act Amendments of 1972, § 402(l)(2), as amended, 33 U.S.C.A. § 1342(l)(2).

[12 Cases that cite this headnote](#)

[14] [Environmental Law](#) 🔑 [Substances, Sources, and Activities Regulated](#)

Environmental Protection Agency (EPA) established substantive controls for municipal storm water discharges required by amendments to Clean Water Act as result of administrator's discretion to determine which controls were necessary. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(3)(A, B), as amended, [33 U.S.C.A. § 1342\(p\)\(3\)\(A, B\)](#).

[5 Cases that cite this headnote](#)

[15] Administrative Law and Procedure 🔑 Notice and comment, necessity

Environmental Law 🔑 Discharge of pollutants

Environmental Protection Agency's (EPA's) group permit application process for industrial dischargers under Clean Water Act storm sewage discharge rules was not invalid despite its failure to provide for notice and comment, as approval of part 1 application was essentially factual determination. [5 U.S.C.A. §§ 551\(4\), 553](#).

[11 Cases that cite this headnote](#)

Attorneys and Law Firms

***1294** [Robert W. Adler](#), Natural Resources Defense Council, Washington, D.C., for petitioner.

[Daniel S. Goodman](#), U.S. Dept. of Justice, Washington, D.C., for respondent.

***1295** Petition for Review of a Rule Promulgated by the Environmental Protection Agency.

Before [PREGERSON](#), [FERGUSON](#), and [O'SCANNLAIN](#), Circuit Judges.

Opinion

[FERGUSON](#), Senior Circuit Judge:

The Natural Resources Defense Council (“NRDC”) challenges aspects of the Environmental Protection Agency's (“EPA”) recent Clean Water Act storm water discharge rule.¹ NRDC argues that the deadlines contained in the rule and the scope of its coverage are unlawful under section 402(l), (p) of the Clean Water Act, [33 U.S.C. § 1342\(l\), \(p\)](#). We grant partial relief.

I. BACKGROUND

In 1972 Congress enacted significant amendments to the Clean Water Act (“CWA”),² [33 U.S.C. §§ 1251–1387 \(1988\)](#), “to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.” [33 U.S.C. § 1251\(a\)](#). One major focus of the CWA is the control of “point source” pollution. A “point source” is “any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel ... from which pollutants are or may be discharged.” [33 U.S.C. § 1362\(14\)](#). The CWA also established the National Pollutant Discharge Elimination System (“NPDES”), requiring permits for any discharge of pollutants from a point source pursuant to section 402 of the CWA, [33 U.S.C. § 1342](#). The CWA empowers EPA or an authorized state to conduct an NPDES permitting program. [33 U.S.C. § 1342\(a\)–\(b\)](#). Under the program, as long as the permit issued contains conditions that implement the requirements of the CWA, the EPA may issue a permit for discharge of any pollutant. [33 U.S.C. § 1342\(a\)\(1\)](#).

This case involves runoff from diffuse sources that eventually passes through storm sewer systems and is thus subject to the NPDES permit program. *See National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Application Deadlines*, 56 Fed.Reg. 56,548 (1991). One recent study concluded that pollution from such sources, including runoff from urban areas, construction sites, and agricultural land, is now a leading cause of water quality impairment. 55 Fed.Reg. at 47,991.³

A. Efforts to Regulate Storm Water Discharge.

Following the enactment of the CWA amendments in 1972, EPA promulgated NPDES permit regulations exempting a number of classes of point sources, including uncontaminated storm water discharge, on the basis of “administrative infeasibility,” i.e., the extraordinary administrative burden imposed on EPA should it have to issue permits for possibly millions of point sources of runoff. *Natural Resources Defense Council v. Costle*, 568 F.2d 1369, 1372 & n. 5, 1377 (D.C.Cir.1977). NRDC *1296 challenged the exemptions. Relying on the language of the statute, its legislative history and precedent, the D.C. Circuit held that the EPA Administrator did not have the authority to create categorical exemptions from regulation. *Id.* at 1379. However, the court acknowledged the agency's discretion to shape permits in ways “not inconsistent with the clear terms of the Act.” *Id.* at 1382.

Following this litigation, EPA promulgated regulations covering storm water discharges in 1979, 1980 and 1984. 56 Fed.Reg. 56,548. NRDC challenged various aspects of these rules both at the administrative level as well as in the courts.

Recognizing both the environmental threat posed by storm water runoff⁴ and EPA's problems in implementing regulations,⁵ Congress passed the Water Quality Act of 1987⁶ containing amendments to the CWA (“the 1987 amendments”), portions of which set up a new scheme for regulation of storm water runoff. Section 402(p), as amended, established deadlines by which certain storm water dischargers must apply for permits, the EPA or states must act on permits and dischargers must implement their permits. *See* Appendix A. The Act also set up a moratorium on permitting requirements for most storm water discharges, which ends on October 1, 1992. There are five exceptions that are required to obtain permits before that date:

- (A) A discharge with respect to which a permit has been issued under this section before February 4, 1987.
- (B) A discharge associated with industrial activity.
- (C) A discharge from a municipal separate storm sewer system serving a population of 250,000 or more.
- (D) A discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000.
- (E) A discharge for which the Administrator or the State, ... determines that the storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States.

CWA § 402(p)(2); 33 U.S.C. § 1342(p)(2).

Section 402(p) also outlines an incremental or “phase-in” approach to issuance of storm water discharge permits. The purpose of this approach was to allow EPA and the states to focus their attention on the most serious problems first. 133 Cong.Rec. 991 (1987). Section 402(p) requires EPA to promulgate rules regulating permit application procedures in a staggered fashion.

Responding to the 1987 amendments requiring the EPA to issue permit application requirements for storm water discharges associated with industrial activities and large municipalities, the EPA issued final rules on November 16, 1990,

almost two years after its deadline (“the November 1990 rule”). 55 Fed.Reg. at 47,990. EPA issued amended rules on March 21, 1991 (“the March 1991 rule”). 56 Fed.Reg. at 12,098. It is to portions of these rules that NRDC objects.

B. Jurisdiction.

We have jurisdiction pursuant to CWA § 509(b)(1), 33 U.S.C. § 1369(b)(1). Section 509(b)(1) describes six types of actions by the EPA administrator that are subject to review in the court of appeals. Although the parties do not specify the section upon which they rely, § 509(b)(1)(F), 33 U.S.C. § 1369(b)(1)(F) allows the court to review *1297 the issuance or denial of a permit under CWA § 402, 33 U.S.C. § 1342. The court also has the power to review rules that regulate the underlying permit procedures. *NRDC v. EPA*, 656 F.2d 768, 775 (D.C.Cir.1981); cf. *E.I. DuPont de Nemours & Co. v. Train*, 430 U.S. 112, 136, 97 S.Ct. 965, 979, 51 L.Ed.2d 204 (1977). NRDC filed timely petitions for review of the final rules at issue here pursuant to CWA § 509(b)(1), 33 U.S.C. 1369(b)(1).

C. Standing.

Any “interested person” may seek review of designated actions of the EPA Administrator. 33 U.S.C. § 1369(b)(1). This court has held that the injury-in-fact rule for standing of *Sierra Club v. Morton*, 405 U.S. 727, 733, 92 S.Ct. 1361, 1365, 31 L.Ed.2d 636 (1972) covers the “interested person” language. *Trustees for Alaska v. EPA*, 749 F.2d 549, 554 (9th Cir.1984) (adopting the analysis in *Montgomery Environmental Coalition v. Costle*, 646 F.2d 568, 578 (D.C.Cir.1980)). A petitioner under *Sierra Club* must suffer adverse affects to her economic interests or “[a]esthetic and environmental well-being.” *Sierra Club*, 405 U.S. at 734, 92 S.Ct. at 1366. Intervenors are various industry and trade groups subject to regulation under the rules at issue. NRDC claims, inter alia, that EPA has delayed unlawfully promulgation of storm water regulations and that its regulations, as published, inadequately control storm water contaminants. NRDC's allegations and the potential economic impact of the rules on the intervenors satisfy the broad standing requirement applicable here.

II. DISCUSSION

A. Standard of Review.

5 U.S.C. § 706(2)(A) (1988) authorizes the court to “set aside agency action ... found to be ... arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” Under this standard a court must find a “rational connection between the facts found and the choice made.” *Sierra Pacific Indus.*, 866 F.2d 1099, 1105 (9th Cir.1989) (citing *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 103 S.Ct. 2856, 2866, 77 L.Ed.2d 443 (1983)). The court must decide whether the agency considered the relevant factors and whether there has been a clear error of judgment. *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416, 91 S.Ct. 814, 823, 28 L.Ed.2d 136 (1971).

On questions of statutory construction, courts must carry out the unambiguously expressed intent of Congress. If a statute is “silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute.” *Chevron U.S.A. Inc. v. Natural Resources Defense Council Inc.*, 467 U.S. 837, 843, 104 S.Ct. 2778, 2782, 81 L.Ed.2d 694 (1984). Congress may leave an explicit gap, thus delegating legislative authority to an agency subject to the arbitrary and capricious standard. *Id.* at 843–44, 104 S.Ct. at 2781–82. If legislative delegation is implicit, courts must defer to an agency's statutory interpretation as long as it is reasonable. *Id.* at 844, 104 S.Ct. at 2782. This is because an agency has technical expertise as well as the authority to reconcile conflicting policies. *See id.* Nevertheless, questions of congressional intent that can be answered with “traditional tools of statutory construction” are still firmly within the province of the courts. *INS v. Cardoza-Fonseca*, 480 U.S. 421, 447–48, 107 S.Ct. 1207, 1221, 94 L.Ed.2d 434 (1987).

B. EPA's Extension of Statutory Deadlines.

1. *Background.*

NRDC challenges EPA's extension of certain statutory deadlines in the November 1990 and March 1991 rules. The statutory scheme calls for EPA to consider permit applications from the most serious sources of pollutants first: industrial dischargers and large municipal separate storm sewer systems ("large systems").⁷ The statute required EPA to establish regulations *1298 for permit application requirements for these two groups by February 4, 1989; to receive applications for permits one year later, February 4, 1990; and to approve or deny the permits by February 4, 1991. Permittees may be given up to three years to comply with their permits. CWA § 402(p)(4)(A), 33 U.S.C. § 1342(p)(4)(A). Medium sized municipal separate storm sewer systems ("medium systems") (those serving a population of 100,000 or more but less than 250,000) are on a similar schedule, except that the deadlines are two years later. CWA § 402(p)(4)(B), 33 U.S.C. § 1342(p)(4)(B). The temporary statutory exemption for all storm water sources expires on October 1, 1992. CWA § 402(p)(1), 33 U.S.C. § 1342(p)(1). EPA states that discharges from municipal separate storm sewer systems serving a population of under 100,000 are to be regulated after that date.

The EPA rules at issue changed the statutory deadlines as follows:

Deadlines pursuant to			EPA
CWA § 402(p) ⁸			Deadlines ⁹
Discharge type	Deadline to issue rules	Deadline for application and approval of permits	Application deadlines
Industrial	2/4/89	2/4/90—applications due 2/4/91—approval due	See below
Large municipal systems	2/4/89	2/4/90—applications due 2/4/91—approval	Part 1— 11/18/91 Part 2— 11/16/92
Medium municipal systems	2/4/91	2/4/92—applications due 2/4/93—approval due	Part 1— 5/18/92 Part 2— 5/17/93

EPA Application Deadlines for "Industrial Activity" Dischargers

<i>Individual</i>	<i>Group</i>
due 11/18/91	Part 1—9/30/91; Part 2—10/1/92

As the chart illustrates, EPA made other elaborations on the statutory scheme in addition to extending the deadlines. Medium and large municipal systems and industrial dischargers are now subject to a two-part application process. [55 Fed.Reg. at 48,072](#). The November 1990 rules allow industrial dischargers to apply for either individual or group permits. *Id.* at 48,066– *1299 67. The March 1991 rules further extended the deadline for part 1 of the group industrial discharger permits to September 30, 1991. ¹⁰ [56 Fed.Reg. at 12,098](#). A final rule published on April 2, 1992 extended the deadline for the part 2 group application for industrial dischargers from May 18, 1992 to October 1, 1992. [57 Fed.Reg. at 11,394](#). The EPA rules at issue contain neither deadlines for final EPA or state approval of permits nor deadlines for compliance with the permit terms.

Seeking to compel the EPA to conform to the statutory scheme, NRDC asks this court:

- a) to declare unlawful EPA's failure to issue certain of the storm water permitting regulations by February 4, 1989 and EPA's extension of certain statutory deadlines;
- b) to enjoin EPA from granting future extensions of the deadlines;
- c) to compel EPA to include deadlines for permit approval or denial and permit compliance consistent with the statute; and
- d) to compel EPA to require that medium and small municipal systems meet the same deadlines as large systems.

2. Discussion.

a. Request for Declaratory Relief.

NRDC asks the court to (1) declare unlawful EPA's failure to issue storm water permitting regulations by February 4, 1989; and (2) declare unlawful EPA's extension of deadlines for submission of permit applications by large and medium systems and individual industrial dischargers.

[1] A request for declaratory relief in a challenge to an agency action is ripe for review if the action at issue is final and the questions involved are legal ones. *Public Util. Dist. No. 1 v. Bonneville Power Admin.*, 947 F.2d 386, 390 n. 1 (9th Cir.1991) (citations omitted), *cert. denied*, 503 U.S. 1004, 112 S.Ct. 1759, 118 L.Ed.2d 422 (1992). Here, the agency regulations are final. *See* [55 Fed.Reg. at 47,990](#), [56 Fed.Reg. at 12,096](#). The question of whether the EPA is bound by the statutory scheme set by Congress is a legal one. The request for declaratory relief is therefore ripe for consideration by this court.

[2] The granting of declaratory relief “rests in the sound discretion of the [] court exercised in the public interest.” 10A Charles A. Wright, Arthur R. Miller & Mary K. Kane, *Federal Practice & Civil Procedure* § 2759, at 645 (1983). The guiding principles are whether a judgment will clarify and settle the legal relations at issue and whether it will afford relief from the uncertainty and controversy giving rise to the proceedings. *McGraw-Edison Co. v. Preformed Line Products Co.*, 362 F.2d 339, 342 (9th Cir.) (citing Borchard, *Declaratory Judgments* 299 (2d ed. 1941)), *cert. denied*, 385 U.S. 919, 87 S.Ct. 229, 17 L.Ed.2d 143 (1966). A court declaration delineates important rights and responsibilities and can be “a message not only to the parties but also to the public and has significant educational and lasting importance.” *Bilbrey by Bilbrey v. Brown*, 738 F.2d 1462, 1471 (9th Cir.1984). Because of the importance of the interests and the principles at stake, we grant declaratory relief.

[3] EPA does not have the authority to ignore unambiguous deadlines set by Congress. *Delaney v. EPA*, 898 F.2d 687, 691 (9th Cir.), *cert. denied*, 498 U.S. 998, 111 S.Ct. 556, 112 L.Ed.2d 563 (1990). In arguing against injunctive relief, EPA points to cases recognizing factors indicating that equitable relief may be inappropriate. *See, e.g., In re*

Barr Laboratories, Inc., 930 F.2d 72, 74 (D.C.Cir.) (agency's choice of priorities is an important factor in considering whether to grant equitable relief), *cert. denied*, 502 U.S. 906, 112 S.Ct. 297, 116 L.Ed.2d 241 (1991); *Natural Resources Defense Council v. Train*, 510 F.2d 692, 712 (D.C.Cir.1975) (court may need to give *1300 agency some leeway due to budgetary commitments or technological problems); *Environmental Defense Fund v. Thomas*, 627 F.Supp. 566, 569–70 (D.D.C.1986) (EPA's good faith is a factor). None of these factors militates against an award of declaratory relief. They do not grant an executive agency the authority to bypass explicit congressional deadlines. The deadlines are not aspirational—Congress set them and expected compliance. *See* 132 Cong.Rec. 32,381–82 (remarks of Senator Stafford, commenting on EPA delay and the establishment of statutory deadlines as “outside dates.”) This court must uphold adherence to the law, and cannot condone the failure of an executive agency to conform to express statutory requirements. For these reasons, we grant NRDC's request for declaratory relief. EPA's failure to abide by the statutory deadlines is unlawful.

b. Request for Injunction.

NRDC asks the Court to enjoin the EPA from further extensions for permit applications from municipal and industrial dischargers. Injunctions are an extraordinary remedy issued at a court's discretion when there is a compelling need. 11 Charles A. Wright & Arthur R. Miller, *Federal Practice & Procedure* § 2942, at 365, 368–69 (1973). We decline to enjoin the EPA on discretionary grounds.

[4] Injunctive relief could involve extraordinary supervision by this court. Injunctive relief may be inappropriate where it requires constant supervision. *Id.* at 376. At issue are deadlines for the three major categories of dischargers, each of which has a two-part application. The permitting process will go on for several years. While recognizing the importance of the interests involved, we nevertheless decline to engage in the active management of such a remedy.

[5] In this situation, we must operate on the assumption that an agency will follow the dictates of Congress and the court. As noted above, the EPA does not have the authority to predicate future rules or deadlines in disagreement with this opinion. *See Allegheny General Hosp. v. NLRB*, 608 F.2d 965, 970 (3rd Cir.1979). We presume that the EPA will duly perform its statutory duties. *See Upholstered Furniture Action Council v. California Bureau of Home Furnishing*, 442 F.Supp. 565, 568 (E.D.Cal.1977) (three judge court). Because we decline to take on potentially extensive supervision of the EPA, Congress may need to find other ways to ensure compliance if the agency is recalcitrant.

c. Deadlines for Permit Approval and Compliance.

NRDC requests that the court compel EPA to revise the rules to include deadlines for permit approval or denial and permit compliance consistent with the statute. Section 402(p)(4)(A) calls for the EPA to issue or deny permits for industrial and large municipalities by February 4, 1991, which is one year after the applications are submitted, and states that “[a]ny such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of the issuance of such permit.” CWA § 402(p)(4)(A), 33 U.S.C. § 1342(p)(4)(A). The statute sets out a similar schedule for medium municipalities, except that the deadlines are two years later. CWA § 402(p)(4)(B), 33 U.S.C. § 1342(p)(4)(B).

[6] The regulations promulgated by the EPA contain neither final approval deadlines nor compliance deadlines for industrial dischargers or medium and large municipalities. 55 Fed.Reg. at 48,072. By failing to regulate final approval and compliance, EPA has omitted a key component of the statutory scheme. To ensure adherence to the statutory time frame, especially in the face of deadlines already missed, the regulated community must be informed of these deadlines. EPA's failure to include these important deadlines is an arbitrary and capricious exercise of its responsibility to issue regulations pursuant to the statute.

We see no need for additional delay while supplemental regulations are issued. Given the extraordinary delays already encountered, EPA must avoid further delay. *1301 The regulations should inform the regulated community of the statute's outside dates for compliance.¹¹ See CWA § 402(p)(4)(A)–(B), 33 U.S.C. § 1342(p)(4)(A)–(B).

d. Timeline for Small and Medium Systems.

[7] The parties disagree on when small systems (those serving a population of less than 100,000) should be regulated. As noted above, the temporary statutory exemption for all storm water sources expires on October 1, 1992. The statute requires EPA to establish a comprehensive program to regulate point sources subject to the moratorium, such as small municipalities, by that date. CWA § 401(p)(1), (6), 33 U.S.C. § 1342(p)(1), (6).

Pointing to a perceived statutory gap, NRDC argues that small systems should be subject to the same permitting schedule applicable to medium systems, to assure that they are regulated when the permitting moratorium ends on October 1, 1992. However, the plain language of the statute prohibits this. Section 402(p)(1) forbids requiring a permit for entities not listed as exceptions (such as small municipalities) before October 1, 1992. Yet the deadline for part 1 of the application for medium systems is currently May 18, 1992. 55 Fed.Reg. at 48,072.

Even if NRDC is correct that EPA is not proceeding so that regulations will be in place on October 1, 1992, we cannot ignore the plain language of the statute by adopting NRDC's solution. The CWA does not require regulation of such systems prior to expiration of the moratorium. We therefore reject NRDC's proposal that small systems be put on the same schedule as medium ones.

[8] NRDC asks the court to put the medium systems on the same schedule as the large systems, in order to achieve closer compliance with the timeline set out in § 402(p)(4)(B). However, EPA's current schedule for medium systems, although delayed, is still within the statutory scheme in its relation to the schedule for large systems. That is, Congress placed the medium systems on a staggered permitting schedule to start two years after the large systems and industrial users. The EPA schedule now has medium municipal system applications due six months after the applications for the large municipal systems. 55 Fed.Reg. at 48,072. For this reason, the current deadline for medium municipalities does not appear to be unreasonable despite the unlawful delay.

C. Exclusion of Certain Sources from Regulation.

1. Definition of "Municipal Separate Storm Sewer System."

Section 402(p) refers to "municipal separate storm sewer system[s] serving a population" of a specified size. CWA § 402(p)(2)(C), (D), 33 U.S.C. § 1342(p)(2)(C), (D). NRDC contends that EPA's definition of this term violates the plain language of the statute, fails to take into account the statutory definition of the word "municipality" and is arbitrary and capricious because the agency considered improper factors when it defined the term. All of this, according to NRDC, results in an impermissible narrowing of the municipalities covered by the first two rounds of permitting.

The 1987 amendments to the CWA did not contain definitions of "municipal" or "separate storm sewer system," but the CWA amendments enacted in 1972 defined "municipality" as follows:

[e]xcept as otherwise specifically provided, when used in this chapter: ... (4) The term "municipality" means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved *1302 management agency under section 1288 of this title [33 U.S.C. § 1288].

[33 U.S.C. § 1362.](#)

In the November 1990 regulations, the EPA defined “municipal separate storm sewer” as: “a conveyance or system of conveyances ... [o]wned or operated by a State, city, town, borough, county, parish, district, association or other public body...” [55 Fed.Reg. at 48,065](#) (to be codified at [40 C.F.R. § 122.26\(b\)\(8\)](#)). This definition echoes the language of [33 U.S.C. § 1362\(4\)](#). However, when defining large and medium municipal separate storm sewer *systems serving a population* of a specified size, EPA brought in other factors. [55 Fed.Reg. at 48,064](#) (to be codified at [40 C.F.R. § 122.26\(b\)\(4\), \(7\)](#)). EPA defines medium and large separate storm sewer systems using two main categories:

- 1) separate storm sewer systems located in an incorporated place with the requisite population, and
- 2) separate storm sewer systems located in unincorporated, urbanized portions of counties containing the requisite population (as listed in Appendices H and I to the rule), excluding those municipal separate sewers located in incorporated places, townships or towns within such counties.¹² [55 Fed.Reg. at 48,064](#). NRDC opposes this definition for municipal separate storm sewer systems for the reasons explained below.

First, NRDC argues that according to the definitional section cited above and principles of statutory construction, general definitions apply wherever the defined term appears elsewhere in the law. See [33 U.S.C. § 1362](#) (“[e]xcept as otherwise specifically provided” the definitions apply throughout the act); *Sierra Club v. Clark*, [755 F.2d 608, 613 \(8th Cir.1985\)](#). NRDC argues that the scope of the statutory definition of “municipality” in [33 U.S.C. § 1362\(4\)](#) and the scope of the phrase “municipal separate storm sewer system serving a population” are the same. NRDC thus proposes that the correct definition is a system of conveyances owned or operated by the full range of entities described at [33 U.S.C. § 1362\(4\)](#), (cities, towns, etc.) with populations within the ranges designated at § 402(p)(2), i.e., 250,000 or more for large systems and between 100,000 and 250,000 for medium systems.

However, we do not believe that the entire phrase used in the act, “municipal separate storm sewer system serving a population of [a specified size]” can be equated with the term “municipality” in the manner that NRDC proposes. The act contains no definition of either “system” or “serving a population.” The word “system” is particularly ambiguous in the context of storm sewers.¹³ We therefore agree with EPA that there is no single, plain meaning for the disputed words.

Because the term is ambiguous, we must look first to whether Congress addressed the issue in another way. See *Abourezk v. Reagan*, [785 F.2d 1043, 1053 \(D.C.Cir.1986\)](#) (“ [i]f the court finds that Congress had a specific intent ..., the court stops there and enforces that intent regardless of the agency's interpretation”) (citing *Chevron U.S.A. Inc. v. Natural Resources Defense Council Inc.*, [467 U.S. 837, 842–43 & n. 9, 104 S.Ct. 2778, 2781 & n. 9, 81 L.Ed.2d 694 \(1984\)](#)), *aff'd by an equally divided court*, [484 U.S. 1, 108 S.Ct. 252, 98 L.Ed.2d 1 \(1987\)](#). The legislative history is not illuminating. Although it explains that a purpose of the permitting scheme was to attack the most serious sources of discharge first,¹⁴ this general goal is not helpful in discerning the specific meaning of “municipal separate storm sewer system serving a population.” Without clear guidance from Congress, we turn to the agency's justifications ***1303** for its choices in the face of NRDC's objections.

NRDC claims that EPA's definition is arbitrary and capricious because EPA considered improper factors, including its own work load, the incorporation status of municipalities, and urban density. “[A]n agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.” *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto Ins.*, [463 U.S. 29, 43, 103 S.Ct. 2856, 2866, 77 L.Ed.2d 443 \(1983\)](#).

EPA's final definition took into account many issues and concerns of the regulated community. *See* 55 Fed.Reg. at 48,039. EPA considered eight different options for defining large and medium municipal separate storm sewer systems. 55 Fed.Reg. at 48,038–43. EPA considered focusing on ownership or operation of a system by an incorporated place, but found that this approach did not take into account systems operated by flood control districts, state transportation systems, or concerns relating to watershed management. It instead fashioned a multi-faceted approach. This choice of approach is not unreasonable.

NRDC challenges EPA's consideration of incorporation as a factor. It claims that limiting regulation to incorporated places of the appropriate size excludes portions of 378 counties that contain over 100,000 people. NRDC essentially contends that because counties are a type of municipality, storm water conveyances in all counties with populations over 100,000 should come within the definition of either medium or large municipal separate storm sewer systems. We have already rejected NRDC's claim that the definition of regulated “systems” must include conveyances in all “municipalities.”

EPA's use of incorporation as a factor is not arbitrary and capricious or inconsistent with the statute. The agency proceeded on the reasonable assumption that cities possess the police powers needed effectively to control land use within their borders. *See* 55 Fed.Reg. at 48,039, 48,043. The first major category within the definition of regulated “systems,” municipal separate storm sewers located within incorporated places having the requisite population, is reasonable.

NRDC questions EPA's second major category, which covers storm sewers located in unincorporated urbanized areas of counties with the designated population, but excludes conveyances located in incorporated places with populations under 100,000 within those counties. The exclusion, however, has a legitimate statutory basis. The statute prohibits EPA from requiring permits for systems serving under 100,000 persons prior to October 1, 1992. CWA § 402(p)(1), 33 U.S.C. § 1342(p)(1). EPA reasonably concluded that conveyances within small incorporated places should be considered parts of small systems limited to those incorporated places, rather than parts of larger systems serving whole counties. EPA's definition attempts to capture population centers of over 100,000 (by including urbanized, unincorporated areas) without violating the congressional stricture against regulation of areas with populations under 100,000 (thus excluding incorporated areas of less than 100,000 within a county).

In arriving at its definition of “municipal separate storm sewer systems serving” a designated population, EPA investigated numerous options and considered comments from a range of viewpoints. We find “a rational connection between the facts found and the choices made.” *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43, 103 S.Ct. at 2866.

NRDC objects to EPA's use of 1980 census data and EPA's definition of urban density. While it appears that NRDC has solid arguments as to why it would be preferable to use 1990 census figures and adopt its method of determining urban density, our role is not to determine whether EPA has chosen the best among all possible *1304 methods. We can only determine if its choices are rational. EPA chose the 1980 census data because it was the most widely available decennial census data at the time of rule formulation and promulgation. Neither this choice nor its use of the Census Bureau's definition of urbanized area is arbitrary and capricious.

EPA took agency work load into account in arriving at its definition. 55 Fed.Reg. at 48,039. NRDC objects on the basis that Congress considered the issue of work load when it developed the “phase-in” approach and allowed permit applications on a system- or jurisdiction-wide basis. However, this broad congressional scheme does not prohibit further consideration of EPA's work load as one among many factors in its attempt to fashion a workable program.

[9] In summary, NRDC's argument that the phrase “municipal separate storm sewer system serving a population” has the plain meaning NRDC proposes is not persuasive. Although EPA's definition in the face of the statute's ambiguity is complex, if not convoluted, it is not arbitrary and capricious, and we therefore reject NRDC's request that the definition be declared invalid.

2. EPA Exemption for Light Industry.

[10] NRDC challenges the portion of the EPA rule excluding various types of “light industry” from the definition of “discharge associated with industrial activity.”

Under CWA § 402(p)(2)(B), a “discharge associated with industrial activity” is an exception to the permit moratorium. In the November rule, EPA modified the statutory scheme by drawing distinctions among light and heavy industry and considering actual exposure to industrial materials. Although the statute does not define “associated with industrial activity,” the EPA definition excludes industries it considers more comparable to retail, commercial or service industries. The excluded categories are manufacturers of pharmaceuticals, paints, varnishes, lacquers, enamels, machinery, computers, electrical equipment, transportation equipment, glass products, fabrics, furniture, paper board, food processors, printers, jewelry, toys and tobacco products. *55 Fed.Reg. at 48,008*. These types of facilities need apply for permits only if certain work areas or actual materials are exposed to storm water. *Id.* EPA justifies these exemptions on the assumption that most of the activity at these types of manufacturers takes place indoors, and that emissions from stacks, use of unhooded manufacturing equipment, outside material storage or disposal, and generation of large amounts of dust and particles will all be minimal. *55 Fed.Reg. at 48,008*.

Thus, EPA considers actual exposure to certain materials or stormwater for the light industry categories, but does not consider actual exposure for the other industrial categories. After careful review of the statutory language and the record, we conclude that this distinction is impermissible.

We note that the language “discharges associated with industrial activity” is very broad. The operative word is “associated.” It is not necessary that storm water be contaminated or come into direct contact with pollutants; only association with any type of industrial activity is necessary.

There is a brief discussion of the issue in the legislative history: “[a] discharge is associated with industrial activity if it is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. Discharges which do not meet this definition include those discharges associated with parking lots and administrative and employee buildings.” 133 Cong.Rec. 985 (1987); *see also* 132 Cong.Rec. 31,968 (1986) (same). EPA argues that the words “directly related” indicate Congress's intent to require permits for only those materials that come in contact with industrial materials. *See 55 Fed.Reg. at 48,007*. However, the examples given—parking lots and administrative buildings—indicate that the intent was to exclude only those facilities or parts of a facility that are completely non-industrial.

EPA's definition follows the language quoted above: “Storm water discharge associated with industrial activity means the *1305 discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant.” *40 C.F.R. § 122.26(b)(14)*. EPA applies this definition differently depending on type of industry. EPA bases its regulation of industrial activity on Standard Industrial Classification (“SIC”) categories. For most of the industrial SIC categories (identified at *40 C.F.R. § 122.26(b)(i-x)*), the EPA definition includes all stormwater discharges from plant yards, access roads and rail lines, material handling sites, storage and disposal sites, shipping and receiving areas, and manufacturing buildings. *40 C.F.R. § 122.26(b)(14)*. However, for the “light industry” categories identified in *40 C.F.R. § 122.26(b)(14)(xi)*, stormwater must be actually exposed to raw materials, by-products, waste, etc., before permitting is required.

EPA justifies this difference on the ground that for “light industry,” industrial activity will take place indoors, and that generation of large amounts of particles and emissions will be minimal. There is nothing in the record submitted to the Court however, which supports this assumption. *See, e.g., 55 Fed.Reg. at 48,008*. Without supportable facts, we are unable to rely on our usual assumption that the EPA has rationally exercised the duties delegated to it by Congress. To exempt these industries from the normal permitting process based on an unsubstantiated assumption about the this group of facilities is arbitrary and capricious.

In addition, by designating these light industries as a group that need only apply for permits if actual exposure occurs, EPA impermissibly alters the statutory scheme. The statute did set up a similar approach for oil, gas, and mining industries. However, no other classes of industrial activities are subject to the more lenient “actual exposure” test. To require actual exposure entirely shifts the burden in the permitting scheme. Most industrial facilities will have to apply for permits and show the EPA or state that they are in compliance. Light industries will be relieved from applying for permits unless actual exposure occurs. The permitting scheme then will work only if these facilities self-report, or the EPA searches out the sources and shows that exposure is occurring. We do not know the likelihood of either self-reporting or EPA inspection and monitoring of light industries, and the regulations appear to contemplate neither for these industries. For this reason, the proposed regulation is also arbitrary and capricious.

In conclusion, we hold that the rule for light industries is arbitrary and capricious, vacate the rule, and remand for further proceedings.

3. Exclusion of Construction Sites of Less than Five Acres.

[11] NRDC challenges the exemption for construction sites of less than five acres. EPA concedes that the construction industry should be subject to storm water permitting because at a high level of intensity, construction is equivalent to other regulated industrial activities. [55 Fed.Reg. at 48,033](#). Construction sites can pollute with soil sediments, phosphorus, nitrogen, nutrients from fertilizers, pesticides, petroleum products, construction chemicals and solid wastes. *Id.* EPA states that such substances can be toxic to aquatic organisms, and affect water used for drinking and recreation. *Id.*

Following its characterization of construction sites as suitable for regulation, EPA defined its task as determining “an acreage limit [] appropriate for identifying sites that amount are (sic) to industrial activity.” [55 Fed.Reg. at 48,036](#). EPA originally proposed regulations that exempted operations that disturb less than one acre of land and are not part of a common plan of development or sale. [55 Fed.Reg. at 48,035–36](#). In response to comments by the regulated community about the administrative burden presented by the regulation, EPA increased the exemption to five acres. [55 Fed.Reg. at 48,036](#). EPA also noted that larger sites will involve heavier equipment for removing vegetation and bedrock than smaller sites. *Id.* at 48,036.

***1306** We find that EPA's rationale for increasing the limit from one to five acres inadequate and therefore arbitrary and capricious. EPA cites no information to support its perception that construction activities on less than five acres are non-industrial in nature.

[12] EPA also claims agency power, inherent in statutory schemes, to make categorical exemptions when the result is *de minimis*. *Alabama Power Co. v. Costle*, 636 F.2d 323, 360 (D.C.Cir.1979). However, if construction activity is industrial in nature, and EPA concedes that it is, EPA is not free to create exemptions from permitting requirements for such activity. See *Natural Resources Defense Council, Inc. v. Costle*, 568 F.2d 1369, 1377 (D.C.Cir.1977) (once Congress has delineated an area that requires permits, EPA is not free to create exemptions).

Further, we find the *de minimis* principle inapplicable here. The *de minimis* exemption is only available where a regulation would “yield a gain of trivial or no value.” *Alabama Power Co.*, *supra*, at 361. Because of the lack of data, we cannot know whether exempting sites of less than five acres will indeed have only a *de minimis* effect.

The *de minimis* concept is based on the principle that the law does not concern itself with trifling matters. *Id.* at 360. We question its applicability in a situation such as this where the gains from application of the statute are being weighed against administrative burdens to the regulated community. See *id.* at 360–361 (implied authority to make cost-benefit decisions must derive from statute, and not general *de minimis* doctrine).

Further, EPA's claim that the five-acre exemption is *de minimis* is contradicted by the admission that even small construction sites can have a significant impact on local water quality. The EPA acknowledges that “[o]ver a short period of time, construction sites can contribute more sediment to streams than was previously deposited over several decades.” 55 Fed.Reg. at 48,033. Without data supporting the expanded exemption, we owe no deference to EPA's line-drawing. We thus hold that EPA's choice of a five-acre limit is arbitrary and capricious, invalidate that portion of the rule exempting construction sites of five acres or less from permitting requirements, and remand for further proceedings.

4. Exemption for oil and gas activities.

The 1987 amendments created an exemption from the permit requirement for uncontaminated runoff from mining, oil and gas facilities. See Appendix, CWA § 402(l)(2), 33 U.S.C. §§ 1342(l)(2). Section 402(l)(2) states that a permit is not required for discharges of storm water runoff from mining, oil or gas operations composed entirely of flows from conveyance systems used for collecting precipitation runoff and “which are not contaminated by contact with, or do not come into contact with any overburden, raw material, intermediate products, finished product, byproduct, or waste products”. NRDC claims that the November 1990 rule sets up an impermissible standard for determining contamination at oil and gas facilities. The relevant portion of the rule states that at these facilities, an operator is not required to submit a permit application unless the facility has had a discharge of a reportable quantity¹⁵ since November 1987, or contributes to a violation of a water quality standard. 55 Fed.Reg. 48,067 (to be codified at 40 C.F.R. § 122.26(c)(1)(iii)). A facility which has had a release of oil or a hazardous substance in excess of RQs since *1307 1987 must submit a permit application. *Id.*; 55 Fed.Reg. at 48,029–30.

NRDC claims that oil and gas operations should be subject to the stricter standards which apply to mining operations.¹⁶ It also objects to EPA's use of RQs as the only test for contamination of runoff from oil and gas storm water dischargers, claiming it is inconsistent with the legislative history. We conclude that the legislative history does not support NRDC's position.

The conference report states:

[P]ermits are not required where stormwater runoff is diverted around mining operations or oil and gas operations and does not come in contact with overburden, raw material, product, or process wastes. In addition, where stormwater runoff is not contaminated by contact with such materials, *as determined by the administrator*, permits are also not required. With respect to oil or grease or hazardous substances, the determination of whether stormwater is “contaminated by contact with” such materials, *as established by the Administrator*, shall take into consideration whether these materials are present in such stormwater runoff in excess of reportable quantities under section 311 of the Clean Water Act ..., or in the case of mining operations, above natural background levels.

H.R.Rep. No. 1004, 99th Cong., 2d Sess., at 151 (emphasis added).

[13] Thus, the EPA Administrator has discretion to determine whether or not storm water runoff at an oil, gas or mining operation is contaminated with two types of materials: (1) overburden, raw material, product, or process wastes and (2) oil, grease or hazardous substances. The report sets out factors for the Administrator to consider in determining contamination for the latter group of pollutants.

NRDC first claims that because section 402(l)(2) treats oil, gas and mining together, the EPA rule must do the same. NRDC's second objection is based on its interpretation of the language in the conference report. Because the conference report lists RQs as only one factor to be taken into consideration, NRDC insists EPA cannot make it the only factor to measure contamination for oil and gas facilities.

Both of these arguments must fail in light of the conference report, which gives the Administrator discretion to determine when contamination has occurred with respect to the substances listed in the statute, i.e., overburden, raw materials, waste products, etc. *See* CWA § 402(l)(2). The conference report states that the Administrator shall take certain factors into account, but the report is clear that the determination of whether storm water is contaminated is within the Administrator's discretion.

NRDC argues that the remarks of certain congressmen during congressional debate show that the mining, oil, and gas exemptions were to apply only if the discharges were entirely free of contaminants. We find these examples less persuasive than the clear language of the conference report. Moreover, in light of the discretion granted the Administrator in the conference report, we cannot say that the rule as promulgated is an arbitrary and capricious exercise of that discretion.

NRDC also contends that Congress intended that EPA consider reportable quantities only in determining if a discharge is contaminated with oil, grease, or hazardous substances. Other pollutants, according to NRDC, must be found to contaminate the discharge if they exceed background levels.

EPA did not, in fact, limit itself to reportable quantities in determining which oil or gas facilities must apply for a permit. The rule requires a permit for any facility which “[c]ontributes to a violation of a water quality standard.” 40 C.F.R. § 122.26(c)(1)(iii)(C). This requirement addresses contamination with substances other than oil and hazardous substances. We find no support in the statute or the legislative history for NRDC's claim that, with respect to these substances, levels above background must be considered “contamination.” The conference report quoted above requires consideration of background levels of any pollutant only with respect to mining operations.

D. Lack of Controls for Municipal Storm Water Discharge.

[14] NRDC contends that EPA has failed to establish substantive controls for municipal storm water discharges as required by the 1987 amendments. Because Congress gave the administrator discretion to determine what controls are necessary, NRDC's argument fails.

Prior to 1987, municipal storm water dischargers were subject to the same substantive control requirements as industrial and other types of storm water. In the 1987 amendments, Congress retained the existing, stricter controls for industrial storm water dischargers but prescribed new controls for municipal storm water discharge. CWA § 402(p)(3)(A), (B), 33 U.S.C. § 1342(p)(3)(A)–(B). The Act states that permits for discharges from municipal storm sewers:

(i) may be issued on a system- or jurisdiction-wide basis;

(ii) shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers; and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, *and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*

Section 402(p)(3)(B), 33 U.S.C. § 1342(p)(3)(B) (emphasis added).

NRDC charges that the EPA regulations accomplish neither of the goals above, i.e., they do not effectively prohibit non-storm water discharges nor do they require the controls described in ¶ (iii), above. NRDC argues that Congress granted the moratorium precisely to give EPA the opportunity to develop new, substantive standards for storm water control of municipal sources and instead EPA wrote vague regulations containing no minimum criteria or performance standards.¹⁷ However, the language in ¶ (iii), above, requires the Administrator or a state to design controls. Congress did not mandate a minimum standards approach or specify that EPA develop minimal performance requirements. NRDC also claims that the testing requirements are inadequate because there is only limited sampling at a limited number

of sites. However, we must defer to EPA on matters such as this, where EPA has supplied a reasoned explanation of its choices. *See* 55 Fed.Reg. at 48,049.

NRDC's argument that the EPA rule is inadequate cannot prevail in the face of the clear statutory language and our standard of review. Congress could have written a statute requiring stricter standards, and it did not. We therefore reject NRDC's argument that EPA's storm water control regulations fail to comply with the statute.¹⁸

E. Lack of Notice and Comment on the Approval of Part 1 of Industrial Group Storm Water Applications.

NRDC objects to the lack of opportunity for notice and comment before EPA approval of part 1 of group applications for industrial dischargers. Each member of a proposed group must submit part 1 of the application.¹⁹ If EPA approves part 1, only *1309 a small subset of the member facilities need submit part 2 of the application. 55 Fed.Reg. at 48,072 (to be codified at 40 C.F.R. 122.26(e)(2)). NRDC claims that because approval of part 1 waives the requirement of filing part 2 for most members of a group, EPA's decision on part 1 is equivalent to a "rule" requiring notice and comment from the public. The issue thus presented is whether EPA's decision on a part 1 group permit application is a "rule" as defined in 5 U.S.C. § 551(4) (1988)²⁰ requiring public notice and opportunity to comment under 5 U.S.C. § 553 (1988), or is otherwise subject to the notice and comment requirement.

[15] NRDC argues that approval or disapproval of a part 1 application requires public comment because it has "general applicability" pursuant to 5 U.S.C. § 551(4) and because it will have a "palpable effect" in that it will relieve the majority of entities in the group from submitting data in part 2 of the application. NRDC cites *NRDC v. EPA*, 683 F.2d 752 (3rd Cir.1982) and *Council of Southern Mountains, Inc. v. Donovan*, 653 F.2d 573 (D.C.Cir.1981) in support of its argument. Both cases involved the postponement of regulations. *See NRDC*, 683 F.2d at 753–54, 764 (indefinite postponement of effective date of final amendments to regulations dealing with the discharge of toxic pollutants requires notice and comment because it has a substantial impact on the public and the industry); *Council of Southern Mountains, Inc.*, 653 F.2d at 575, 580 n. 28 (deferral of implementation of regulations requiring coal operators to supply life-saving equipment ordinarily would require notice and comment because it has a "palpable effect" upon the industry and the public).

We find these cases to be distinguishable. Both involve the postponement of rules of general applicability to an entire industry, or to a large class of pollutants. In contrast, although the part 1 application process will relieve some entities from the need to furnish further data, the decision is specific to a particular permit application and approval of a preliminary application will not implement, interpret or prescribe any general law or policy pursuant to 5 U.S.C. § 551(4). Rulemaking ordinarily involves "broad judgments, legislative in nature rather than the resolution of a particular dispute of facts." *Washington Utilities & Transportation Com'n v. Federal Communication Commission*, 513 F.2d 1142, 1160 (9th Cir.1975), *cert. denied*, 423 U.S. 836, 96 S.Ct. 62, 46 L.Ed.2d 54 (1975). The decision to approve a part 1 permit application, although it may affect a large number of applicants, is nevertheless focused on a specific factual question: whether the application adequately designates a representative smaller group subject to the more extensive data gathering requirements in part 2 of the application. *See* 55 Fed.Reg. at 48,028. Because the decision involves a discrete, factual issue, the better view is that it is neither a rule nor otherwise subject to the notice and comment requirement.

Because approval of a part 1 application is essentially a factual determination, we hold that EPA's group permit application process for industrial dischargers is not invalid by its failure to provide for notice and comment.

III. CONCLUSION

In summary, we grant and deny relief as follows:

1. *“Deadlines” issue.* We grant the request for declaratory relief and deny the request for injunctive relief. We deny the request to place small, medium and large municipalities on the same permitting schedule. We hold that EPA's failure to include deadlines for permit approval or denial and compliance consistent with CWA § 402(p) is arbitrary and capricious.

2. *Exclusion of Sources from Regulation.* We uphold the definition of “municipal *1310 separate storm sewers serving a population.” We hold that the exemption for construction sites of less than five acres is arbitrary and capricious and remand for further proceedings. Based on the record before us, we vacate that portion of the rule regulating “light industry” and remand for further proceedings.

3. *Other issues.* We uphold the rule as to oil and gas operations and storm water control. We further hold that EPA approval of part 1 of a group application for an industrial discharger is not a rule requiring notice and comment from the public.

Petition for Review GRANTED IN PART and DENIED IN PART.

APPENDIX A

CWA § 402, 33 USCA § 1342

(l) Limitation on permit requirement

....

(2) Stormwater runoff from oil, gas, and mining operations

The Administrator shall not require a permit under this section, nor shall the Administrator directly or indirectly require any State to require a permit, for discharges of stormwater runoff from mining operations or oil and gas exploration, production, processing, or treatment operations or transmission facilities, composed entirely of flows which are from conveyances or systems of conveyances (including but not limited to pipes, conduits, ditches, and channels) used for collecting and conveying precipitation runoff and which are not contaminated by contact with, or do not come into contact with, any overburden, raw material, intermediate products, finished product, byproduct, or waste products located on the site of such operations.

....

(p) Municipal and industrial stormwater discharges

(1) General rule

Prior to October 1, 1992, the Administrator or the State (in the case of a permit program approved under this section) shall not require a permit under this section for discharges composed entirely of stormwater.

(2) Exceptions

Paragraph (1) shall not apply with respect to the following stormwater discharges:

(A) A discharge with respect to which a permit has been issued under this section before February 4, 1987.

(B) A discharge associated with industrial activity.

(C) A discharge from a municipal separate storm sewer system serving a population of 250,000 or more.

(D) A discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000 .

(E) A discharge for which the Administrator or the State, as the case may be, determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

(3) Permit requirements

(A) Industrial discharges

Permits for discharges associated with industrial activity shall meet all applicable provisions of this section and section 1311 of this title.

(B) Municipal discharge

Permits for discharges from municipal storm sewers—

(i) may be issued on a system- or jurisdiction-wide basis;

(ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or *1311 the State determines appropriate for the control of such pollutants.

(4) Permit application requirements

(A) Industrial and large municipal discharges

Not later than 2 years after February 4, 1987, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraphs (2)(B) and (2)(C). Applications for permits for such discharges shall be filed no later than 3 years after February 4, 1987. Not later than 4 years after February 4, 1987, the Administrator or the State, as the case may be, shall issue or deny each such permit. Any such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit.

(B) Other municipal discharges

Not later than 4 years after February 4, 1987, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraph (2)(D). Applications for permits for such discharges shall be filed no later than 5 years after February 4, 1987. Not later than 6 years after February 4, 1987, the Administrator or the State, as the case may be, shall issue or deny each such permit. Any such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit.

(5) Studies

The Administrator, in consultation with the States, shall conduct a study for the purposes of—

(A) identifying those stormwater discharges or classes of stormwater discharges for which permits are not required pursuant to paragraphs (1) and (2) of this subsection;

(B) determining, to the maximum extent practicable, the nature and extent of pollutants in such discharges; and

(C) establishing procedures and methods to control stormwater discharges to the extent necessary to mitigate impacts on water quality.

Not later than October 1, 1988, the Administrator shall submit to Congress a report on the results of the study described in subparagraphs (A) and (B). Not later than October 1, 1989, the Administrator shall submit to Congress a report on the results of the study described in subparagraph (C).

(6) Regulations

Not later than October 1, 1992, the Administrator, in consultation with State and local officials, shall issue regulations (based on the results of the studies conducted under paragraph (5)) which designate stormwater discharges, other than those discharges described in paragraph (2), to be regulated to protect water quality and shall establish a comprehensive program to regulate such designated sources. The program shall, at a minimum, (A) establish priorities, (B) establish requirements for State stormwater management programs, and (C) establish expeditious deadlines. The program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate.

[O'SCANNLAIN](#), Circuit Judge, concurring in part and dissenting in part:

I concur in Parts I, II.A, II.C.1, II.C.4, II.E, and much of Part II.B of the majority opinion. I dissent from Part II.B.2.c, directing EPA to issue supplemental regulations. I dissent also from Parts II.C.2 and II.C.3, in which the court invalidates EPA's exclusion of storm water discharges from certain light industrial and small construction sites from the definition of "discharges associated with industrial activity." Finally, I concur in the result, but not the reasoning, of Part II.D, holding that EPA has not acted unlawfully by failing to include specific control requirements in the permit application regulations.

***1312 I**

The majority holds that EPA has violated statutory requirements by failing to set dates for approval of, and compliance with, permits as part of its permit application program. *Ante* at 1300. Despite the holding in Part II.B.2.b that injunctive relief is inappropriate (with which I agree), the majority in Part II.B.2.c orders EPA to issue supplemental regulations setting such deadlines immediately.

I am not convinced that the statute requires EPA to set these deadlines as part of the permit application process. The provision at issue reads, in relevant part:

(4) Permit application requirements

(A) Industrial and large municipal discharges

Not later than 2 years after February 4, 1987, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraphs (2)(B) and (2)(C). Applications for permits for such discharges shall be filed no later than 3 years after February 4, 1987. Not later than 4 years after February 4, 1987, the Administrator or the State, as the case may be, shall issue or deny each such permit. Any such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit.

(B) Other municipal discharges

Not later than 4 years after February 4, 1987, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraph (2)(D). Applications for permits for such discharges shall be filed no later than 5 years after February 4, 1987. Not later than 6 years after February 4, 1987, the Administrator or the State, as the case may be, shall issue or deny each such permit. Any such permit shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit.

CWA § 402(p)(4); 33 U.S.C. § 1342(p)(4) (1988).

While the statute establishes a time line EPA must follow, it does not, in my view, require that EPA include the deadline for permit approval in the permit application regulations. I agree that, given EPA's past delays and the fact that the statutory dates for issuance or denial of permits are now long past, it is appropriate for this court to declare that the statute requires EPA to issue or deny permits within one year of the application deadline. I do not, however, see that any purpose is served by requiring EPA to issue supplemental regulations setting out these deadlines, and I doubt our authority to do so.

With respect to compliance deadlines, the statute contemplates that such deadlines will be set in individual permits as they are issued. *See* CWA § 402(p)(4)(A), (B) (“Any such permit shall provide for compliance....”). Each permit must contain a compliance deadline, which may not exceed three years from the date of issuance. Nothing in the statute requires EPA to establish compliance deadlines now, before any permits have been issued. Accordingly, in my view, NRDC's challenge to the lack of compliance deadlines in EPA's current regulations is premature. I therefore dissent from Part II.B.2.c of the majority opinion.

II

I dissent also from Parts II.C.2 and II.C.3. In my view, EPA's definition of “discharge associated with industrial activity” is a reasonable construction of an ambiguous statute, entitled to deference. While my colleagues acknowledge that we may not overturn an agency rule that represents a “permissible construction” of a statute, *ante* at 1297 (quoting *Chevron, U.S.A., Inc. v. NRDC*, 467 U.S. 837, 843, 104 S.Ct. 2778, 2781, 81 L.Ed.2d 694 (1984)), they fail to apply that axiom.

A

EPA's rule excludes from the permitting requirement certain light industry facilities at which “areas where material handling equipment or activities, raw materials, intermediate *1313 products, final products, waste materials, byproducts, or industrial machinery” are not exposed to storm water. *See* 40 C.F.R. § 122.26(b)(14). EPA determined that discharges from such facilities do not fall within the definition of “discharges associated with industrial activity.” In my view, this determination was reasonable.

The majority concedes that the statute does not define “discharge associated with industrial activity.” *Ante* at 1304. The operative phrase, as my colleagues note, is “associated with.” *See id.* For purposes of evaluating the light industry exemption, I concede that manufacturing falls within the generally accepted meaning of “industrial activity,” and that many of the facilities exempted by the EPA rule are manufacturers. Nonetheless, that concession does not compel the conclusion that discharges from such facilities are “associated with industrial activity.”

The majority concludes, without explanation, that the phrase “discharges associated with industrial activity” is “very broad.” *Ante* at 1304. Neither the plain meaning of the term “associated” nor the legislative history of the statute support

this conclusion. “Associated with” means closely related to or connected with. *See Webster's Ninth New Collegiate Dictionary* 110 (1986). To the extent it casts any light on the subject, the legislative history supports a narrow reading of the phrase “associated with.” Four members of the House, in the course of floor debates on the measure both before and after President Reagan's veto, explained that:

[a] discharge is associated with industrial activity if it is *directly related to manufacturing, processing or raw materials storage areas* at an industrial plant. Discharges which do not meet this definition include those discharges associated with parking lots and administrative and employee buildings.

133 Cong.Rec. 985 (1987) (statement of Rep. Hammerschmidt) (emphasis added).¹ The underscored language suggests that Congress intended to regulate only discharges directly related to certain activities at industrial facilities. EPA's interpretation, that discharges are “directly related” to these activities only if storm water may reasonably be expected to come into contact with them before its discharge, is eminently logical.

The majority opinion interprets the exclusion of parking lots as an expression of congressional intent “to exclude only those facilities or parts of a facility that are completely nonindustrial.” *Ante* at 1304. My colleagues' reliance on the second sentence of the statement quoted above to establish this intent, however, is misplaced. The sentence relied on cannot assist us in our search for the meaning of “associated with” because it employs that very term. Moreover, it does not pretend to establish an exhaustive list of areas excluded from regulation. Legislators listed discharges from parking lots and administrative and employee buildings as *among those* not directly related to industrial activity; no one suggested that *only* discharges associated with those structures were to be excluded.

EPA's definition is consistent with the plain words of the statute and, to the extent any intent is discernible, the congressional intent. EPA has defined the term “storm water discharge associated with industrial activity” to cover only those discharges reasonably expected to come into contact with industrial activities. A large number of facilities automatically fall within EPA's definition and are required to *1314 apply for permits. Because facilities falling within certain specified classifications under the Standard Industrial Classification manual generally conduct their operations entirely indoors, minimizing the likelihood of contact with storm water, EPA has not automatically included them within the regulations. However, these facilities *are* required to apply for permits if “areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, byproducts, or industrial machinery at these facilities are exposed to storm water.” 40 C.F.R. § 122.26(b)(14). If a storm water discharge is in fact directly related to or associated with the industrial activity carried on at a facility falling within the light industry category, the facility must obtain a permit.²

In my view, the statute's treatment of oil and gas facilities supports EPA's reading of the term “associated with industrial activity.” Congress specifically exempted from the permit requirement discharges from oil and gas facilities and mining operations which have not come in contact with raw materials, finished products, or waste products. CWA § 402(l)(2). This section indicates a congressional intent to exempt uncontaminated discharges which have not come into contact with “industrial activities” from regulation. For oil, gas, and mining operations, Congress in this section supplied a specific, and quite limited, definition of “industrial activities.” For other facilities, that definition was left to the discretion of EPA, which has adopted a much broader definition, encompassing contact with such things as industrial machinery and materials handling equipment. *See* 40 C.F.R. § 122.26(b)(14).

I do not mean to suggest that the majority's construction of the statute is untenable. It may even be preferable to the reading chosen by the agency. Nonetheless, in my view the statute is ambiguous and the legislative history does not demonstrate any clear congressional intent. The question before this court, therefore, is not whether “the agency construction was the only one it permissibly could have adopted” or even whether it is the “reading the court would have reached if the question initially had arisen in a judicial proceeding.” *Chevron, U.S.A. v. NRDC*, 467 U.S. 837, 843 n. 11,

104 S.Ct. 2778, 2782 n. 11, 81 L.Ed.2d 694 (1984). We need only inquire if the agency's construction is a permissible one. *Id.* at 843, 104 S.Ct. at 2781. EPA's definition falls well within permissible bounds, and should be upheld.

B

Although the issue is closer, I also am not persuaded that EPA's exemption for construction sites under five acres should be struck down. EPA has not conceded that "construction activity is industrial in nature." *Ante* at 1306. In the preamble to its final rule, EPA noted that "Construction activity *at a high level of intensity is comparable to other activity that is traditionally viewed as industrial*, such as natural resource extraction."³ 55 Fed.Reg. 48,033 (1990) (emphasis added). EPA explained that it was "attempting to focus [regulation] only on those construction activities *1315 that resemble industrial activity." 55 Fed.Reg. at 48,035 (emphasis added).

Neither NRDC nor the majority point to anything in the statute or the legislative history that would require the agency to define "industrial activity" as including all construction operations. Accordingly, I believe deference is due EPA's definition, provided it is not arbitrary, capricious, or manifestly contrary to the statute. *Chevron, U.S.A., 467 U.S. at 844*, 104 S.Ct. at 2782.

In trying to determine when construction should be treated as industrial activity, EPA considered a number of possible approaches. See 55 Fed.Reg. at 48,035. Exempting construction that would be completed within a certain designated time frame was deemed inappropriate, because the work could be both intensive and expansive but nonetheless take place over a short period of time. Basing the limit on quantity of soil removed was also rejected as not relating to the amount of land surface disturbed. EPA finally settled on the surface area disturbed by the construction project as a feasible and appropriate mechanism for "identifying sites that are [sic] amount to industrial activity." 55 Fed.Reg. at 48,036.

Having determined that not all construction amounts to industrial activity, and that the appropriate basis for differentiation is land area disturbed, EPA then had to determine where to draw the line. Initially, EPA proposed to exempt all construction operations disturbing less than one acre of land, as well as single family residential projects disturbing less than five acres. 53 Fed.Reg. 49,431 (1988). In the final rule, however, EPA adopted a five-acre minimum for all construction projects. 55 Fed.Reg. 48,066 (1990); 40 C.F.R. § 122.26(b)(14)(x).

Admittedly, the final rule contains little in the way of justification for treating two-acre sites differently than five-acre ones, but that does not necessarily make it arbitrary and capricious. Line-drawing is often difficult. NRDC was apparently willing to accept EPA's proposed one-acre/five-acre rule. Although NRDC now challenges the blanket five-acre rule, it offers no evidence that sites excluded from the permitting requirement constitute "industrial activity." In such absence of any evidence in the record undermining EPA's conclusion on an issue squarely within its expertise, I believe the rule must be upheld.⁴

III

Finally, while I concur in the result reached by the majority in Part II.D, rejecting NRDC's claim that EPA has unlawfully failed to require substantive controls on municipal discharges, I disagree with the majority's reasoning. In my view, NRDC's claim is premature, and we should decline to address its merits.

NRDC contends that the 1987 amendments require EPA to establish substantive controls for municipal storm water discharges. In support of this argument, NRDC relies on CWA § 402(p)(3)(B), 33 U.S.C. § 1342(p)(3)(B), which provides:

Permits for discharges from municipal storm sewers—

* * * * *

(ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable....

This section refers only to *permits*, and says nothing about permit applications. Because EPA has yet to issue any permits, NRDC's claim on this point is premature. In the absence of any indication to the contrary, we must assume that any permit issued will comply with all applicable statutory requirements. The statute does not require that EPA detail the substantive controls to be imposed when establishing permit application requirements. Accordingly, I would reject NRDC's claim without *1316 reaching the issue of the Administrator's discretion in selecting those controls.

IV

In sum, I join much of my colleagues' opinion. However, I would not require EPA to issue supplemental regulations detailing the time line for issuance of and compliance with permits, and I would uphold EPA's definition of "discharge associated with industrial activity." Finally, I would reject NRDC's claim that EPA is required to detail control measures in the permit application regulations on the grounds that the statute requires control measures only in the permits themselves.

All Citations

966 F.2d 1292, 34 ERC 2017, 61 USLW 2015, 22 Env'tl. L. Rep. 20,950

Footnotes

- 1 [National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges](#), 55 Fed.Reg. 47,990 (1990) (to be codified at 40 C.F.R. § 122.26); [National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Application Deadline for Group Applications](#), 56 Fed.Reg. 12,098 (1991) (to be codified at 40 C.F.R. § 122.26(e)).
- 2 The Act is popularly known as the Clean Water Act or the Federal Water Pollution Control Act. 33 U.S.C. § 1251. For more background on the CWA, see *EPA v. State Water Resources Control Bd.*, 426 U.S. 200, 202–09, 96 S.Ct. 2022, 2023–26, 48 L.Ed.2d 578 (1976); *Sierra Club v. Union Oil of California*, 813 F.2d 1480, 1483 (9th Cir.1987), *vacated on other grounds*, 485 U.S. 931, 108 S.Ct. 1102, 99 L.Ed.2d 264 (1988); and *Natural Resources Defense Council v. Train*, 510 F.2d 692, 695–97 (D.C. Cir.1975).
- 3 The Nationwide Urban Runoff Program (NURP) conducted from 1978 through 1983 found that urban runoff from residential, commercial and industrial areas produces a quantity of suspended solids and chemical oxygen demand that is equal to or greater than that from secondary treatment sewage plants. 55 Fed.Reg. at 47,991. A significant number of samples tested exceeded water quality criteria for one or more pollutants. *Id.* at 47,992. Urban runoff is adversely affecting 39% to 59% of the harvest-limited shellfish beds in the waters off the East Coast, West Coast and in the Gulf of Mexico. 56 Fed.Reg. at 56,548.
- 4 See 132 Cong. Rec. 32,381 (1986).
- 5 Senator Stafford, speaking in favor of the conference report for the Water Quality Act, noted that "EPA should have developed this program long ago. Unfortunately, it did not. The conference substitute provides a short grace period during which EPA and the States generally may not require permits for municipal separate storm sewers." 132 Cong. Rec. 32,381 (1986). Senator Chafee stated "[t]he Agency has been unable to move forward with a [storm water discharge control] program, because the current law did not give enough guidance to the Agency. This provision provides such guidance, and I expect EPA to move rapidly to implement this control program." 133 Cong. Rec. 1,264 (1987).
- 6 Pub.L. No. 100–4, 101 Stat. 7 (1987) (codified as amended in scattered sections of 33 U.S.C.).
- 7 Large municipal systems are those serving a population of 250,000 or more. § 402(p)(2)(C).

8 Since NRDC filed this action, Congress has passed certain legislation affecting some of the deadlines at issue. Congress ratified the date of September 30, 1991 for part 1 of group applications for industrial dischargers. *See* Dire Emergency Supplemental Appropriations Act of 1991, [Pub.L. No. 102–27, § 307, 105 Stat. 130](#), 152 (1991).

Section 1068 of the Intermodal Surface Transportation Efficiency Act of 1991 (“ISTEA”) clarifies the deadlines for storm water discharges associated with industrial activity from facilities owned or operated by a municipality. [Pub.L. No. 102–240, § 1068, 105 Stat. 1914](#), 2007 (1991). ISTEA deadlines are being reviewed in a separate case. Nothing in this opinion should be viewed as requiring EPA to comply with deadlines that have been altered or superseded by the ISTEA.

9 *See* [55 Fed.Reg. at 48,071–722](#) (to be codified at [40 C.F.R. § 122.26\(e\)](#)); [67 Fed.Reg. at 12,100](#) (to be codified at [40 C.F.R. § 122.26\(e\)\(2\)\(iii\)](#)). EPA changed certain of these deadlines after this case was submitted. These changes are the subject of a separate case.

The EPA rules at issue set no date for final approval or denial of applications from municipal or industrial dischargers, nor for compliance by these regulated entities. *See* [55 Fed.Reg. at 48,072](#).

10 NRDC initially claimed that this extension was unlawful because it was granted without proper notice and comment. However, Congress approved this extended deadline in a supplemental appropriations bill. Dire Emergency Supplemental Appropriations Act of 1991, [Pub.L. No. 102–27 § 307, 105 Stat. 130](#), 152 (1991). This Act moots the procedural and substantive challenge to this extended deadline.

11 In addition, pursuant to the statute, compliance deadlines applicable to each facility shall be contained in its permit.

12 The rule also permits the Administrator to include certain other systems as part of a medium or large system due to the physical interconnections between the systems, their locations, or certain other factors. *See* [40 C.F.R. § 122.26\(b\)\(4\)\(iii\)](#), (iv) and (b)(7)(iii), (iv).

13 Storm sewers located within the boundaries of a city might be part of a state highway system, a flood control district, or a system operated by the state or county. *See* [55 Fed.Reg. at 48,041](#).

14 *See, e.g.*, 133 Cong. Rec. 991 (1987) (statement of Rep. Stangeland).

15 “Reportable Quantities” (RQs) are not effluent guidelines setting up permissible limits for pollutants. Rather, they are quantities the discharge of which “may be harmful to the public health or welfare of the United States.” CWA § 311(b)(4), [33 U.S.C. § 1321\(b\)\(4\)](#). EPA has established RQs for a large number of substances, pursuant to both CWA section 311, [33 U.S.C. § 1321](#), and the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”) section 102, [42 U.S.C. § 9602](#). *See* 40 C.F.R. Parts 110, 117, 302. The operator of any vessel or facility which releases the RQ of any substance must immediately notify the National Response Center. *See, e.g.*, [40 C.F.R. § 110.10](#).

16 Operators of mines must submit permit applications whenever storm water discharges come into contact with overburden, waste products, etc. [40 C.F.R. § 122.26\(c\)\(1\)\(iv\)](#).

17 The requirements for permit applications are set forth at [40 C.F.R. § 122.26\(d\)](#). Individual NPDES permit writers (EPA or state officials) will decide whether application proposals are adequate. Applicants must submit information on source control methods and estimate the annual pollutant load reduction to be achieved from their proposed management programs, but they are not required to achieve any specified level of reduction of any pollutants. *See* [55 Fed.Reg. at 48,070–71](#).

18 We base our holding on NRDC’s challenge to the regulations at issue. Whether a specific permit complies with the requirements of section 402(p)(3)(B) would, of course, be another matter not controlled by this decision.

19 Part I must include the identity of the group’s participants, a description of the participants’ industrial activities, a list of significant materials exposed to precipitation and the identity of the subset of the group’s members who will submit quantitative data in part 2 of the application. [55 Fed.Reg. at 48,067](#).

20 A rule means “the whole or part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of an agency....” [5 U.S.C. § 551\(4\)](#).

1 This statement was repeated verbatim by Reps. Stangeland and Snyder. 133 Cong. Rec. at 991–92; 132 Cong. Rec. at 31,959, 31,964 (1986). Rep. Rowland offered a slight variation on the theme:

One of the discharge categories is “a discharge associated with an industrial activity.” A discharge is not considered to be associated with industrial activity unless it is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. Such discharges include [sic] those from parking lots and administrative areas and employee buildings.

132 Cong. Rec. at 31,968. Rep. Rowland apparently misspoke; he probably meant, like the other legislators who addressed the topic, to say “[s]uch discharges *do not* include” those from parking lots.

- 2 Thus, nothing turns on the assumption, attacked by my colleagues as unsupported by the record, *ante* at 1304, that industrial activities at this category of facilities will take place largely indoors. Where the assumption does not hold true, the permit requirement applies with full force. I also note that NRDC has pointed us to no evidence undermining EPA's assumption. Unlike my colleagues, I decline to assume that EPA will not carry out its responsibility to identify and to require permits of facilities where industrial activities are in fact exposed to storm water, or that such facilities will ignore their statutory duty to apply for permits. Should that occur, a lawsuit challenging EPA's failure to enforce its regulations might well be in order. An unsubstantiated suspicion that EPA may not vigorously enforce its regulations, however, does not make those regulations arbitrary or capricious.
- 3 EPA did admit that “[e]ven small construction sites may have a significant negative impact on water quality in localized areas,” *55 Fed.Reg. at 48,033*. In the absence of any indication of what EPA meant by “small,” however, that statement does not undermine EPA's exemption of sites under five acres.
- 4 Because I conclude that the rule falls within the permissible bounds of the statutory definition of “discharges associated with industrial activity,” I need not consider the applicability of the *de minimis* exception.

ATTACHMENT 21



KeyCite Yellow Flag - Negative Treatment

Opinion Amended on Denial of Rehearing by [Defenders of Wildlife v. Browner](#), 9th Cir., December 7, 1999

191 F.3d 1159
United States Court of Appeals,
Ninth Circuit.

DEFENDERS OF WILDLIFE and The Sierra Club, Petitioners,

v.

Carol M. BROWNER, in her official capacity as Administrator of
the United States Environmental Protection Agency, Respondent.
City of Tempe, Arizona; City of Tucson, Arizona; City of Mesa, Arizona; Pima
County, Arizona; and City of Phoenix, Arizona, Intervenors–Respondents.

No. 98–71080.

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Argued and Submitted Aug. 11, 1999.

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Decided Sept. 15, 1999.

Environmental organizations sought review of Environmental Protection Agency (EPA) decision to issue National Pollution Discharge Elimination System (NPDES) permits to five municipalities, for their separate storm sewers, without requiring numeric limitations to ensure compliance with state water-quality standards. The Court of Appeals, [Graber](#), Circuit Judge, held that: (1) organizations had standing; (2) municipal storm-sewer discharges did not have to strictly comply with state water-quality standards; but (3) EPA had discretion to require that municipal discharges comply with such standards.

Petition denied.

West Headnotes (8)

[1] **Environmental Law** 🔑 Cognizable interests and injuries, in general

For purpose of statute authorizing any interested person to seek judicial review of Environmental Protection Agency (EPA) decision issuing or denying any National Pollution Discharge Elimination System (NPDES) permit, “any interested person” means any person that satisfies the injury-in-fact requirement for Article III standing. [U.S.C.A. Const. Art. 3, § 2, cl. 1](#); Federal Water Pollution Control Act Amendments of 1972, § 509(b)(1)(F), [33 U.S.C.A. § 1369\(b\)\(1\)\(F\)](#).

[2 Cases that cite this headnote](#)

[2] **Environmental Law** 🔑 Organizations, associations, and other groups

Environmental organizations had standing to seek judicial review of Environmental Protection Agency (EPA) decision to issue National Pollution Discharge Elimination System (NPDES) permits for municipalities' storm sewers based on allegation that organizations' members used and enjoyed ecosystems affected by storm water discharges and sources thereof governed by the permits. [U.S.C.A. Const. Art. 3, § 2, cl. 1](#); Federal Water Pollution Control Act Amendments of 1972, § 509(b)(1)(F), [33 U.S.C.A. § 1369\(b\)\(1\)\(F\)](#).

6 Cases that cite this headnote

[3] **Environmental Law** 🔑 Permit and certification proceedings

Although best practicable control technology (BPT) requirement for National Pollution Discharge Elimination System (NPDES) permits takes into account issues of practicability, the Environmental Protection Agency (EPA) also is under a specific obligation to require that level of effluent control which is needed to implement existing water quality standards without regard to the limits of practicability. Federal Water Pollution Control Act Amendments of 1972, §§ 301(b)(1)(A, C), 402(a)(1), 33 U.S.C.A. §§ 1311(b)(1)(A, C), 1342(a)(1).

11 Cases that cite this headnote

[4] **Environmental Law** 🔑 Discharge of pollutants

Water Quality Act amendments to the Clean Water Act do not require municipal storm-sewer discharges to strictly comply with state water-quality standards, in order to obtain National Pollution Discharge Elimination System (NPDES) permit, but instead prescribe separate standard requiring reduction of discharge of pollutants to maximum extent practicable, in view of Act's distinction between municipal and industrial discharges. Federal Water Pollution Control Act Amendments of 1972, §§ 301(b)(1)(C), 402(p)(3)(B)(iii), 33 U.S.C.A. §§ 1311(b)(1)(C), 1342(p)(3)(B)(iii).

15 Cases that cite this headnote

[5] **Administrative Law and Procedure** 🔑 Plain, literal, or clear meaning;ambiguity

Questions of congressional intent that can be answered with traditional tools of statutory construction are still firmly within the province of the courts under *Chevron*, which governs review of an agency's interpretation of a statute.

5 Cases that cite this headnote

[6] **Statutes** 🔑 Language and intent, will, purpose, or policy

Statutes 🔑 Statute as a Whole;Relation of Parts to Whole and to One Another

Using traditional tools of statutory construction when interpreting a statute, courts look first to the words that Congress used, and, rather than focusing just on the word or phrase at issue, courts look to the entire statute to determine Congressional intent.

5 Cases that cite this headnote

[7] **Statutes** 🔑 Express mention and implied exclusion;expressio unius est exclusio alterius

Where Congress includes particular language in one section of a statute but omits it in another section of the same act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.

5 Cases that cite this headnote

[8] **Environmental Law** 🔑 Conditions and limitations

Environmental Protection Agency (EPA) is not prohibited from requiring, under Clean Water Act, that municipal storm-sewer discharges strictly comply with state water-quality standards, but has discretion to

determine appropriate pollution controls. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(3)(B)(iii), 33 U.S.C.A. § 1342(p)(3)(B)(iii).

[13 Cases that cite this headnote](#)

Attorneys and Law Firms

***1160** [Jennifer Anderson](#) and David Baron, Arizona Center for Law in the Public Interest, Phoenix, Arizona, for the petitioners.

[Alan Greenberg](#), Attorney, U.S. Department of Justice, Environment & Natural Resources Division, Denver, Colorado, for the respondent.

[Craig Reece](#), Phoenix City Attorney's Office, Phoenix, Arizona; [Stephen J. Burg](#), Mesa City Attorney's Office, Mesa, Arizona; [Timothy Harrison](#), Tucson City Attorney's Office, Tucson, Arizona; [Harlan C. Agnew](#), Deputy County Attorney, Tucson, Arizona; and [Charlotte Benson](#), Tempe City Attorney's Office, Tempe, Arizona, for the intervenors-respondents.

***1161** [David Burchmore](#), Squire, Sanders & Dempsey, Cleveland, Ohio, for amici curiae.

Petition to Review a Decision of the Environmental Protection Agency. EPA No. 97-3.

Before: [NOONAN](#), [THOMPSON](#), and [GRABER](#), Circuit Judges.

Opinion

[GRABER](#), Circuit Judge:

Petitioners challenge the Environmental Protection Agency's (EPA) decision to issue National Pollution Discharge Elimination System (NPDES) permits to five municipalities, for their separate storm sewers, without requiring numeric limitations to ensure compliance with state water-quality standards. Petitioners sought administrative review of the decision within the EPA, which the Environmental Appeals Board (EAB) denied. This timely petition for review ensued. For the reasons that follow, we deny the petition.

FACTUAL AND PROCEDURAL BACKGROUND

[Title 26 U.S.C. § 1342\(a\)\(1\)](#) authorizes the EPA to issue NPDES permits, thereby allowing entities to discharge some pollutants. In 1992 and 1993, the cities of Tempe, Tucson, Mesa, and Phoenix, Arizona, and Pima County, Arizona (Intervenors), submitted applications for NPDES permits. The EPA prepared draft permits for public comment; those draft permits did not attempt to ensure compliance with Arizona's water-quality standards.

Petitioner Defenders of Wildlife objected to the permits, arguing that they must contain numeric limitations to ensure strict compliance with state water-quality standards. The State of Arizona also objected.

Thereafter, the EPA added new requirements:

To ensure that the permittee's activities achieve timely compliance with applicable water quality standards (Arizona Administrative Code, Title 18, Chapter 11, Article 1), the permittee shall implement the [Storm Water Management Program], monitoring, reporting and other

requirements of this permit in accordance with the time frames established in the [Storm Water Management Program] referenced in Part I.A.2, and elsewhere in the permit. This timely implementation of the requirements of this permit shall constitute a schedule of compliance authorized by [Arizona Administrative Code, section R18-11-121\(C\)](#).

The Storm Water Management Program included a number of structural environmental controls, such as storm-water detention basins, retention basins, and infiltration ponds. It also included programs to remove illegal discharges.

With the inclusion of those “best management practices,” the EPA determined that the permits ensured compliance with state water-quality standards. The Arizona Department of Environmental Quality agreed:

The Department has reviewed the referenced municipal NPDES storm-water permit pursuant to Section 401 of the Federal Clean Water Act to ensure compliance with State water quality standards. We have determined that, based on the information provided in the permit, and the fact sheet, adherence to provisions and requirements set forth in the final municipal permit, will protect the water quality of the receiving water.

On February 14, 1997, the EPA issued final NPDES permits to Intervenor. Within 30 days of that decision, Petitioners requested an evidentiary hearing with the regional administrator. *See* 40 C.F.R. § 124.74. Although Petitioners requested a hearing, they conceded that they raised only a legal issue and that a hearing was, in fact, unnecessary. Specifically, Petitioners raised only the legal question whether the Clean Water Act (CWA) requires numeric limitations to ensure strict compliance with state water-quality standards; they did not raise the factual question whether the management practices that the EPA chose would be effective.

***1162** On June 16, 1997, the regional administrator summarily denied Petitioners' request. Petitioners then filed a petition for review with the EAB. *See* 40 C.F.R. § 124.91(a). On May 21, 1998, the EAB denied the petition, holding that the permits need not contain numeric limitations to ensure strict compliance with state water-quality standards. Petitioners then moved for reconsideration, *see* 40 C.F.R. § 124.91(i), which the EAB denied.

JURISDICTION

[1] [2] [Title 33 U.S.C. § 1369\(b\)\(1\)\(F\)](#) authorizes “any interested person” to seek review in this court of an EPA decision “issuing or denying any permit under [section 1342](#) of this title.” “Any interested person” means any person that satisfies the injury-in-fact requirement for Article III standing. *See* [Natural Resources Defense Council, Inc. v. EPA](#), 966 F.2d 1292, 1297 (9th Cir.1992) [*NRDC II*]. It is undisputed that Petitioners satisfy that requirement. Petitioners allege that “[m]embers of Defenders and the Club use and enjoy ecosystems affected by storm water discharges and sources thereof governed by the above-referenced permits,” and no other party disputes those facts. *See* [Lujan v. Defenders of Wildlife](#), 504 U.S. 555, 565–66, 112 S.Ct. 2130, 119 L.Ed.2d 351 (1992) (“[A] plaintiff claiming injury from environmental damage must use the area affected by the challenged activity.”); *see also* [NRDC II](#), 966 F.2d at 1297 (“NRDC claims, inter alia, that [the] EPA has delayed unlawfully promulgation of storm water regulations and that its regulations, as published, inadequately control storm water contaminants. NRDC's allegations ... satisfy the broad standing requirement applicable here.”).

Intervenors argue, however, that they were not parties when this action was filed and that this court cannot redress Petitioners' injury without them. Their real contention appears to be that they are indispensable parties under [Federal Rule of Civil Procedure 19](#). We need not consider that contention, however, because in fact Intervenor has been permitted to intervene in this action and to present their position fully. In the circumstances, Intervenor has suffered no injury.

DISCUSSION

A. *Standard of Review*

The Administrative Procedures Act (APA), 5 U.S.C. §§ 701–06, provides our standard of review for the EPA's decision to issue a permit. *See American Mining Congress v. EPA*, 965 F.2d 759, 763 (9th Cir.1992). Under the APA, we generally review such a decision to determine whether it was “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A).

On questions of statutory interpretation, we follow the approach from *Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984). *See NRDC II*, 966 F.2d at 1297 (so holding). In *Chevron*, 467 U.S. at 842–44, 104 S.Ct. 2778, the Supreme Court devised a two-step process for reviewing an administrative agency's interpretation of a statute that it administers. *See also Bicycle Trails Council of Marin v. Babbitt*, 82 F.3d 1445, 1452 (9th Cir.1996) (“The Supreme Court has established a two-step process for reviewing an agency's construction of a statute it administers.”). Under the first step, we employ “traditional tools of statutory construction” to determine whether Congress has expressed its intent unambiguously on the question before the court. *Chevron*, 467 U.S. at 843 n. 9, 104 S.Ct. 2778. “If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress.” *Id.* at 842–43, 104 S.Ct. 2778 (footnote omitted). If, instead, Congress has left a gap for the administrative agency to fill, we proceed to step two. *See id.* at 843, 104 S.Ct. 2778. At step two, we must uphold the administrative regulation unless it is “arbitrary, capricious, or manifestly contrary to the statute.” *Id.* at 844, 104 S.Ct. 2778.

*1163 B. *Background*

The CWA generally prohibits the “discharge of any pollutant,” 33 U.S.C. § 1311(a), from a “point source” into the navigable waters of the United States. *See* 33 U.S.C. § 1362(12)(A). An entity can, however, obtain an NPDES permit that allows for the discharge of some pollutants. *See* 33 U.S.C. § 1342(a)(1).

[3] Ordinarily, an NPDES permit imposes effluent limitations on such discharges. *See* 33 U.S.C. § 1342(a)(1) (incorporating effluent limitations found in 33 U.S.C. § 1311). First, a permit-holder “shall ... achiev[e] ... effluent limitations ... which shall require the application of the best practicable control technology [BPT] currently available.” 33 U.S.C. § 1311(b)(1)(A). Second, a permit-holder “shall ... achiev[e] ... any more stringent limitation, including those necessary to meet water quality standards, treatment standards or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title).” 33 U.S.C. § 1311(b)(1)(C) (emphasis added). Thus, although the BPT requirement takes into account issues of practicability, *see Rybachek v. EPA*, 904 F.2d 1276, 1289 (9th Cir.1990), the EPA also “is under a specific obligation to require that level of effluent control which is needed to implement existing water quality standards without regard to the limits of practicability,” *Oklahoma v. EPA*, 908 F.2d 595, 613 (10th Cir.1990) (internal quotation marks omitted), *rev'd on other grounds sub nom. Arkansas v. Oklahoma*, 503 U.S. 91, 112 S.Ct. 1046, 117 L.Ed.2d 239 (1992). *See also Ackels v. EPA*, 7 F.3d 862, 865–66 (9th Cir.1993) (similar).

The EPA's treatment of storm-water discharges has been the subject of much debate. Initially, the EPA determined that such discharges generally were exempt from the requirements of the CWA (at least when they were uncontaminated by any industrial or commercial activity). *See* 40 C.F.R. § 125.4 (1975).

The Court of Appeals for the District of Columbia, however, invalidated that regulation, holding that “the EPA Administrator does not have authority to exempt categories of point sources from the permit requirements of § 402 [33 U.S.C. § 1342].” *Natural Resources Defense Council, Inc. v. Costle*, 568 F.2d 1369, 1377 (D.C.Cir.1977). “Following this

decision, [the] EPA issued proposed and final rules covering storm water discharges in 1980, 1982, 1984, 1985 and 1988. These rules were challenged at the administrative level and in the courts.” *American Mining Congress*, 965 F.2d at 763.

Ultimately, in 1987, Congress enacted the Water Quality Act amendments to the CWA. See *NRDC II*, 966 F.2d at 1296 (“Recognizing both the environmental threat posed by storm water runoff and [the] EPA’s problems in implementing regulations, Congress passed the Water Quality Act of 1987 containing amendments to the CWA.”) (footnotes omitted). Under the Water Quality Act, from 1987 until 1994,¹ most entities discharging storm water did not need to obtain a permit. See 33 U.S.C. § 1342(p).

Although the Water Quality Act generally did not require entities discharging storm water to obtain a permit, it did require such a permit for discharges “with respect to which a permit has been issued under this section before February 4, 1987,” 33 U.S.C. § 1342(p)(2)(A); discharges “associated with industrial activity,” 33 U.S.C. § 1342(p)(2)(B); discharges from a “municipal separate sewer system serving a population of [100,000] or more,” 33 U.S.C. § 1342(p)(2)(C) & (D); and “[a] discharge for which the Administrator ... determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States,” 33 U.S.C. § 1342(p)(2)(E).

***1164** When a permit is required for the discharge of storm water, the Water Quality Act sets two different standards:

(A) Industrial discharges

Permits for discharges associated with industrial activity shall meet all applicable provisions of this section and *section 1311* of this title.

(B) Municipal discharge

Permits for discharges from municipal storm sewers—

(i) may be issued on a system or jurisdiction-wide basis;

(ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator ... determines appropriate for the control of such pollutants.

33 U.S.C. § 1342(p)(3) (emphasis added).

C. Application of Chevron

[4] The EPA and Petitioners argue that the Water Quality Act is ambiguous regarding whether Congress intended for municipalities to comply strictly with state water-quality standards, under 33 U.S.C. § 1311(b)(1)(C). Accordingly, they argue that we must proceed to step two of *Chevron* and defer to the EPA’s interpretation that the statute does require strict compliance. See *Zimmerman v. Oregon Dep’t of Justice*, 170 F.3d 1169, 1173 (9th Cir.1999) (“At step two, we must uphold the administrative regulation unless it is arbitrary, capricious, or manifestly contrary to the statute.”) (citation and internal quotation marks omitted), *cert. denied*, 531 U.S. 1189, 121 S.Ct. 1186, 149 L.Ed.2d 103, 68 USLW 3129 (1999).

Intervenors and *amici*, on the other hand, argue that the Water Quality Act expresses Congress’ intent unambiguously and, thus, that we must stop at step one of *Chevron*. See, e.g., *National Credit Union Admin. v. First Nat’l Bank & Trust Co.*, 522 U.S. 479, 118 S.Ct. 927, 938–39, 140 L.Ed.2d 1 (1998) (“Because we conclude that Congress has made it clear

that the *same* common bond of occupation must unite each member of an occupationally defined federal credit union, we hold that the NCUA's contrary interpretation is impermissible under the first step of *Chevron*.”) (emphasis in original); *Sierra Club v. EPA*, 118 F.3d 1324, 1327 (9th Cir.1997) (“Congress has spoken clearly on the subject and the regulation violates the provisions of the statute. Our inquiry ends at the first prong of *Chevron*.”). We agree with Intervenor and *amici*: For the reasons discussed below, the Water Quality Act unambiguously demonstrates that Congress did not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C). That being so, we end our inquiry at the first step of the *Chevron* analysis.

[5] [6] “[Q]uestions of congressional intent that can be answered with ‘traditional tools of statutory construction’ are still firmly within the province of the courts” under *Chevron*. *NRDC II*, 966 F.2d at 1297 (citation omitted). “Using our ‘traditional tools of statutory construction,’ *Chevron*, 467 U.S. at 843 n. 9, 104 S.Ct. 2778, 81 L.Ed.2d 694, when interpreting a statute, we look first to the words that Congress used.” *Zimmerman*, 170 F.3d at 1173 (alterations, citations, and internal quotation marks omitted). “Rather than focusing just on the word or phrase at issue, we look to the entire statute to determine Congressional intent.” *Id.* (alterations, citations, and internal quotation marks omitted).

As is apparent, Congress expressly required *industrial* storm-water discharges to comply with the requirements of 33 U.S.C. § 1311. See 33 U.S.C. § 1342(p)(3)(A) (“Permits for discharges associated with industrial activity *shall meet all applicable provisions of this section and section 1311 of this title.*”) (emphasis added). By incorporation, then, industrial *1165 storm-water discharges “*shall ... achiev[e] ... any more stringent limitation, including those necessary to meet water quality standards, treatment standards or schedules of compliance, established pursuant to any State law or regulation (under authority preserved by section 1370 of this title).*” 33 U.S.C. § 1311(b)(1)(C) (emphasis added); see also Sally A. Longroy, *The Regulation of Storm Water Runoff and its Impact on Aviation*, 58 J. Air. L. & Com. 555, 565–66 (1993) (“Congress further *singled out* industrial storm water dischargers, all of which are on the high-priority schedule, and requires them to satisfy all provisions of section 301 of the CWA [33 U.S.C. § 1311].... Section 301 further mandates that NPDES permits include requirements that receiving waters meet water quality based standards.”) (emphasis added). In other words, industrial discharges must comply strictly with state water-quality standards.

Congress chose not to include a similar provision for municipal storm-sewer discharges. Instead, Congress required municipal storm-sewer discharges “to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator ... determines appropriate for the control of such pollutants.” 33 U.S.C. § 1342(p)(3)(B)(iii).

[7] The EPA and Petitioners argue that the difference in wording between the two provisions demonstrates ambiguity. That argument ignores precedent respecting the reading of statutes. Ordinarily, “[w]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.” *Russello v. United States*, 464 U.S. 16, 23, 104 S.Ct. 296, 78 L.Ed.2d 17 (1983) (citation and internal quotation marks omitted); see also *United States v. Hanousek*, 176 F.3d 1116, 1121 (9th Cir.1999) (stating the same principle), *petition for cert. filed*, 68 USLW 3138 (Aug. 23, 1999). Applying that familiar and logical principle, we conclude that Congress' choice to require industrial storm-water discharges to comply with 33 U.S.C. § 1311, but not to include the same requirement for municipal discharges, must be given effect. When we read the two related sections together, we conclude that 33 U.S.C. § 1342(p)(3)(B)(iii) does not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C).

Application of that principle is significantly strengthened here, because 33 U.S.C. § 1342(p)(3)(B) is not merely silent regarding whether municipal discharges must comply with 33 U.S.C. § 1311. Instead, § 1342(p)(3)(B)(iii) replaces the requirements of § 1311 with the requirement that municipal storm-sewer dischargers “reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator ... determines appropriate for the control

of such pollutants.” 33 U.S.C. § 1342(p)(3)(B)(iii). In the circumstances, the statute unambiguously demonstrates that Congress did not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C).

Indeed, the EPA's and Petitioners' interpretation of 33 U.S.C. § 1342(p)(3)(B)(iii) would render that provision superfluous, a result that we prefer to avoid so as to give effect to all provisions that Congress has enacted. See *Government of Guam ex rel. Guam Econ. Dev. Auth. v. United States*, 179 F.3d 630, 634 (9th Cir.1999) (“This court generally refuses to interpret a statute in a way that renders a provision superfluous.”), *as amended*, 1999 WL 604218 (9th Cir. Aug.12, 1999). As all parties concede, § 1342(p)(3)(B)(iii) creates a lesser standard than § 1311. Thus, if § 1311 continues to apply to municipal storm-sewer discharges, *1166 the more stringent requirements of that section always would control.

Contextual clues support the plain meaning of § 1342(p)(3)(B)(iii), which we have described above. The Water Quality Act contains other provisions that undeniably exempt certain discharges from the permit requirement altogether (and therefore from § 1311). For example, “[t]he Administrator shall not require a permit under this section for discharges composed entirely of return flows from irrigated agriculture.” 33 U.S.C. § 1342(l)(1). Similarly, a permit is not required for certain storm-water runoff from oil, gas, and mining operations. See 33 U.S.C. § 1342(l)(2). Read in the light of those provisions, Congress' choice to exempt municipal storm-sewer discharges from strict compliance with § 1311 is not so unusual that we should hesitate to give effect to the statutory text, as written.

Finally, our interpretation of § 1342(p)(3)(B)(iii) is supported by this court's decision in *NRDC II*. There, the petitioner had argued that “the EPA has failed to establish substantive controls for municipal storm water discharges as required by the 1987 amendments.” *NRDC II*, 966 F.2d at 1308. This court disagreed with the petitioner's interpretation of the amendments:

Prior to 1987, municipal storm water dischargers were subject to the same substantive control requirements as industrial and other types of storm water. In the 1987 amendments, *Congress retained the existing, stricter controls for industrial storm water dischargers but prescribed new controls for municipal storm water discharge.*

Id. (emphasis added). The court concluded that, under 33 U.S.C. § 1342(p)(3)(B)(iii), “*Congress did not mandate a minimum standards approach.*” *Id.* (emphasis added). The question in *NRDC II* was not whether § 1342(p)(3)(B)(iii) required strict compliance with state water-quality standards, see 33 U.S.C. § 1311(b)(1)(C). Nonetheless, the court's holding applies equally in this action and further supports our reading of 33 U.S.C. § 1342(p).

In conclusion, the text of 33 U.S.C. § 1342(p)(3)(B), the structure of the Water Quality Act as a whole, and this court's precedent all demonstrate that Congress did not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C).

D. Required Compliance with 33 U.S.C. § 1311(b)(1)(C)

[8] We are left with Intervenor's contention that the EPA may not, under the CWA, require strict compliance with state water-quality standards, through numerical limits or otherwise. We disagree.

Although Congress did not require municipal storm-sewer discharges to comply strictly with § 1311(b)(1)(C), § 1342(p)(3)(B)(iii) states that “[p]ermits for discharges from municipal storm sewers ... shall require ... *such other provisions as the Administrator ... determines appropriate for the control of such pollutants.*” (Emphasis added.) That provision gives the EPA discretion to determine what pollution controls are appropriate. As this court stated in *NRDC II*, “Congress gave the administrator discretion to determine what controls are necessary.... NRDC's argument that the EPA rule is inadequate cannot prevail in the face of the clear statutory language.” 966 F.2d at 1308.

Under that discretionary provision, the EPA has the authority to determine that ensuring strict compliance with state water-quality standards is necessary to control pollutants. The EPA also has the authority to require less than strict compliance with state water-quality standards. The EPA has adopted an interim approach, which “uses best management practices (BMPs) in first-round storm water permits ... to provide for the attainment of water quality standards.” The EPA applied that approach to the permits at issue here. Under [33 U.S.C. § 1342\(p\)\(3\)\(B\)\(iii\)](#), the EPA's choice to include *1167 either management practices or numeric limitations in the permits was within its discretion. See [NRDC II, 966 F.2d at 1308](#) (“Congress did not mandate a minimum standards approach or specify that [the] EPA develop minimal performance requirements.”). In the circumstances, the EPA did not act arbitrarily or capriciously by issuing permits to Intervenor.

PETITION DENIED.

All Citations

191 F.3d 1159, 30 Env'tl. L. Rep. 20,116, 99 Cal. Daily Op. Serv. 7618, 1999 Daily Journal D.A.R. 9661, 1999 Daily Journal D.A.R. 12,369

Footnotes

- 1 As enacted, the Water Quality Act extended the exemption to October 1, 1992. Congress later amended the Act to change that date to October 1, 1994. See [Pub.L. No. 102-580](#).

ATTACHMENT 22

 KeyCite Yellow Flag - Negative Treatment

Declined to Follow by [Mrosek v. City of Peachtree City](#), N.D.Ga., December 22, 2014

344 F.3d 832

United States Court of Appeals,
Ninth Circuit.

ENVIRONMENTAL DEFENSE CENTER, INC., Petitioner,
[Natural Resources Defense Council, Inc.](#), Petitioner–Intervenor,

v.

[UNITED STATES ENVIRONMENTAL PROTECTION AGENCY](#), Respondent.

American Forest & Paper Association; National Association of Home Builders, Petitioners,

v.

[United States Environmental Protection Agency](#), Respondent,
[Natural Resources Defense Council, Inc.](#), Applicant–Intervenor.

Texas Cities Coalition on Stormwater; Texas Counties Storm Water Coalition, Petitioners,

v.

[United States Environmental Protection Agency](#), Respondent,
[Natural Resources Defense Council, Inc.](#), Respondent–Intervenor.

Nos. 00–70014, 00–70734, 00–70822.

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Argued and Submitted Dec. 3, 2001.

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Filed Sept. 15, 2003.

Environmental, municipal, and industry groups brought petitions for review of Environmental Protection Agency (EPA) rule mandating that discharges from small municipal storm sewers and construction sites be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements. On denial of rehearing, the Court of Appeals, [James R. Browning](#), Circuit Judge, held that: (1) EPA had authority to impose rule; (2) rule did not violate the Tenth Amendment; (3) rule improperly failed to provide for review of notices of intent and public participation in NPDES permitting process; (4) EPA's failure to designate industrial sources of storm water pollution for permitting requirements was not arbitrary and capricious; (5) challenge to rule's exclusion of forest roads was not time-barred; (6) forestry trade association lacked standing to challenge rule; (7) EPA properly consulted with state and local officials; (8) sites subject to rule were properly designated; and (9) EPA properly retained authority to designate future sources of storm water pollution for regulation.

Petitions for review granted in part and denied in part.

[Tallman](#), Circuit Judge, filed opinion concurring in part and dissenting in part, and would have granted petition for rehearing.

Opinion, [319 F.3d 398](#), vacated.

West Headnotes (33)

[1] **Environmental Law** 🔑 Sewage and sewers

Environmental Law 🔑 Discharge of pollutants

Storm sewers are established “point sources” subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements under Clean Water Act (CWA). Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., 33 U.S.C.A. § 1251 et seq.

[4 Cases that cite this headnote](#)

[2] **Environmental Law** 🔑 Substances, Sources, and Activities Regulated

Diffuse runoff, such as rainwater that is not channeled through point source, is considered “nonpoint source” pollution and is not subject to federal regulation under Clean Water Act (CWA). Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., 33 U.S.C.A. § 1251 et seq.

[3 Cases that cite this headnote](#)

[3] **Constitutional Law** 🔑 Resolution of non-constitutional questions before constitutional questions

Court of Appeals avoids considering constitutionality of a rule if an issue may be resolved on narrower grounds.

[5 Cases that cite this headnote](#)

[4] **Environmental Law** 🔑 Discharge of pollutants

Environmental Protection Agency (EPA) interpretation of rule promulgated under Clean Water Act (CWA), whereby EPA would require that discharges from small municipal storm sewers and construction sites be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements, was reasonable, and thus EPA acted within its statutory mandate in formulating permit program under rule; even though permitting was not included on statutory list of elements for EPA's comprehensive program to regulate small sewer systems, list was non-exclusive, and statutory language requiring imposition of permits for “municipal storm sewers” was reasonably interpreted to extend to small systems. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(6), 33 U.S.C.A. § 1342(p)(6).

[9 Cases that cite this headnote](#)

[5] **Environmental Law** 🔑 Conditions and limitations

Minimum measures set forth by rule as conditions for issuance of stormwater discharge permit to operator of small municipal storm sewers did not exceed authority of Environmental Protection Agency (EPA) under Clean Water Act (CWA), as statute's list of elements for regulatory program was nonexclusive, and rule included at least one alternative to minimum measures. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(6), 33 U.S.C.A. § 1342(p)(6); 40 C.F.R. §§ 122.26(d), 122.26, 122.33(b)(1), 122.34(b), (d)(1)(i).

[4 Cases that cite this headnote](#)

[6] **States** 🔑 Surrender of state sovereignty and coercion of state

Under the Tenth Amendment, the Federal Government may not compel States to implement, by legislation or executive action, federal regulatory programs. [U.S.C.A. Const.Amend. 10](#).

[1 Cases that cite this headnote](#)

[7] States [↔ Surrender of state sovereignty and coercion of state](#)

Under the Tenth Amendment, the federal government may not force the States to regulate third parties in furtherance of a federal program. [U.S.C.A. Const.Amend. 10](#).

[1 Cases that cite this headnote](#)

[8] States [↔ Powers of United States and Infringement on State Powers](#)

Protections of Tenth Amendment, whereby federal government may not compel States to implement federal regulatory programs by legislation or executive action, nor force the States to regulate third parties in furtherance of a federal program, extend to municipalities. [U.S.C.A. Const.Amend. 10](#).

[1 Cases that cite this headnote](#)

[9] United States [↔ State and local governments and agencies](#)

While federal government may not compel them to do so, it may encourage States and municipalities to implement federal regulatory programs; for example, the federal government may make certain federal funds available only to those States or municipalities that enact a given regulatory regime. [U.S.C.A. Const.Amend. 10](#).

[Cases that cite this headnote](#)

[10] States [↔ Surrender of state sovereignty and coercion of state](#)

The crucial proscribed element under the Tenth Amendment, as to federal government's ability to have states implement federal programs, is coercion; the residents of the State or municipality must retain the ultimate decision as to whether or not the State or municipality will comply with the federal regulatory program, but as long as the alternative to implementing a federal regulatory program does not offend the Constitution's guarantees of federalism, the fact that the alternative is difficult, expensive, or otherwise unappealing is insufficient to establish a Tenth Amendment violation. [U.S.C.A. Const.Amend. 10](#).

[1 Cases that cite this headnote](#)

[11] Environmental Law [↔ Validity](#)

States [↔ Surrender of state sovereignty and coercion of state](#)

Environmental Protection Agency (EPA) rule promulgated under Clean Water Act (CWA), whereby discharges from small municipal storm sewers and construction sites were subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements, did not wrongfully compel municipalities to regulate third parties under federal law as condition of receiving permit to operate, as would contravene Tenth Amendment; although one means of obtaining permit would require municipality to adopt various enforcement procedures, permit applicants retained option of applying for Alternative Permit. [U.S.C.A. Const.Amend. 10](#); Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., [33 U.S.C.A. § 1251 et seq.](#); [40 C.F.R. §§ 122.26\(d\), 122.34](#).

[1 Cases that cite this headnote](#)

[12] Constitutional Law  Political speech, beliefs, or activity in general**Environmental Law**  Discharge of pollutants

Environmental Protection Agency (EPA) adoption of “Public Education” and “Illicit Discharge” Minimum Measures within rules governing discharges from small municipal storm sewers and construction sites, whereby such discharges would be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements under Clean Water Act (CWA), did not wrongfully compel municipalities to deliver EPA's political messages, and thus did not violate municipalities' free speech rights under First Amendment; requiring providers of storm sewers that discharged into national waters to educate public about impacts of storm water discharge, and to inform affected parties, including public, about hazards of improper waste disposal fell short of compelling political speech, since they did not dictate specific ideological message. [U.S.C.A. Const.Amend. 1](#); Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., [33 U.S.C.A. § 1251 et seq.](#)

[10 Cases that cite this headnote](#)

[13] Administrative Law and Procedure  Notice and comment, sufficiency

In determining whether notice to interested parties was adequate under informal rulemaking strictures of Administrative Procedure Act (APA) when final regulation has varied from proposal, court must consider whether new round of notice and comment would have provided first opportunity for interested parties to offer comments that could have persuaded agency to modify its ruling. [5 U.S.C.A. § 553](#).

[3 Cases that cite this headnote](#)

[14] Environmental Law  Notice and comment

Environmental Protection Agency (EPA) adoption of Alternative Permit option within rules governing discharges from small municipal storm sewers and construction sites, whereby such discharges would be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements under Clean Water Act (CWA), properly complied with minimum notice and comment procedures required in informal rulemaking under Administrative Procedure Act (APA), since Alternative Permit option was logical outgrowth of comments received by EPA in response to proposed rule, and option contained no elements that were not part of proposed rule, even though it was configured differently. [5 U.S.C.A. § 553](#); Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., [33 U.S.C.A. § 1251 et seq.](#)

[3 Cases that cite this headnote](#)

[15] Environmental Law  Ripeness

Challenge to Environmental Protection Agency (EPA) rule allowing operators of small municipal storm sewers to pursue general permit option to meet National Pollutant Discharge Elimination System (NPDES) requirements under Clean Water Act (CWA) was ripe for review, as issue did not involve merits of any specific permit but was purely one of statutory interpretation that would not benefit from further factual development; issue specifically was whether EPA accomplished the substantive controls for municipal stormwater that Congress mandated in the CWA. Federal Water Pollution Control Act Amendments of 1972, § 402(p), [33 U.S.C.A. § 1342\(p\)](#).

[11 Cases that cite this headnote](#)

[16] Environmental Law  Discharge of pollutants

General permitting scheme of Environmental Protection Agency (EPA) rules governing discharges from small municipal storm sewers and construction sites, whereby such discharges would be subject to National Pollutant Discharge Elimination System (NPDES) requirements under Clean Water Act (CWA), improperly allowed sewer system operators to design storm water pollution control programs without adequate regulatory and public oversight, and thus contravened CWA, since permitting scheme did not require EPA to review content of dischargers' notices of intent, and did not contain express requirements for public participation in NPDES permitting process. Federal Water Pollution Control Act Amendments of 1972, § 402(p)(3), 33 U.S.C.A. § 1342(p)(3); 40 C.F.R. § 122.34.

6 Cases that cite this headnote

[17] **Administrative Law and Procedure** 🔑 Administrative construction

Administrative Law and Procedure 🔑 Theory and grounds of administrative decision

Court of Appeals normally defers to an agency's interpretations of its own regulations, but it may decline to defer to the post hoc rationalizations of appellate counsel.

8 Cases that cite this headnote

[18] **Environmental Law** 🔑 Discharge of pollutants

Failure of Environmental Protection Agency (EPA) to designate industrial sources of storm water pollution for discharge permit program, whereby such discharges would become subject to National Pollutant Discharge Elimination System (NPDES) requirements, was not arbitrary and capricious, and thus did not violate Clean Water Act (CWA); rather than designating industrial discharge sources on nationwide basis under NPDES program, EPA sought to establish local and regional designation authority for such sources. Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., as amended, 33 U.S.C.A. § 1251 et seq.

10 Cases that cite this headnote

[19] **Environmental Law** 🔑 Accrual, computation, and tolling

Petitioners' challenge to failure of Environmental Protection Agency (EPA) to regulate stormwater drainage from forest roads did not have to be raised either when EPA initially promulgated silviculture regulations excluding certain silvicultural activities from National Pollutant Discharge Elimination System (NPDES) permitting requirements, or when EPA considered amending such regulations but chose not to do so, and challenge was thus not time-barred, to extent that present challenge was made to EPA's decision not to address forest roads under later-enacted portion of Clean Water Act (CWA) directed to municipal and industrial stormwater discharges. Federal Water Pollution Control Act Amendments of 1972, §§ 402(p), 509(b)(1), 33 U.S.C.A. §§ 11342(p), 1369(b)(1); 40 C.F.R. § 122.27(b)(1).

11 Cases that cite this headnote

[20] **Environmental Law** 🔑 Water pollution

Petitioners' comments during rulemaking process in connection with Environmental Protection Agency (EPA) rule governing municipal and industrial stormwater discharges pursuant to Clean Water Act (CWA) were not so inadequate as to preclude appellate court jurisdiction to hear petitioners' subsequent challenge to rule's failure to address stormwater drainage from forest roads; comments comprised two paragraphs, with footnotes, stating objections and providing support, EPA was aware of forest road sedimentation problem at time of rulemaking,

and EPA responded to comments without disputing that problem was serious. Federal Water Pollution Control Act Amendments of 1972, § 402(p), [33 U.S.C.A. § 1342\(p\)](#).

[2 Cases that cite this headnote](#)

[21] Environmental Law  [Organizations, associations, and other groups](#)

Forestry and paper association lacked sufficient standing to challenge Environmental Protection Agency (EPA) rule mandating that discharges from small municipal storm sewers and construction sites be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements under Clean Water Act (CWA), since association's interest in avoiding future regulation of forest roads was not actually or imminently affected by rule at issue. Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., [33 U.S.C.A. § 1251 et seq.](#)

[6 Cases that cite this headnote](#)

[22] Environmental Law  [Permit and certification proceedings](#)

Environmental Protection Agency (EPA), in promulgating rule mandating that discharges from small municipal storm sewers and construction sites be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements, properly consulted with state and local officials, and thus did not violate Clean Water Act (CWA); draft of first report pertaining to proposed rule was circulated to states and municipalities, EPA regional offices, professional associations and other stakeholders, and rule was revised based upon comments received. Federal Water Pollution Control Act Amendments of 1972, § 402(p), [33 U.S.C.A. § 1342\(p\)](#).

[2 Cases that cite this headnote](#)

[23] Environmental Law  [Organizations, associations, and other groups](#)

Environmental Law  [Government entities, agencies, and officials](#)

Home builders' association and municipalities possessed sufficient standing to challenge designation by Environmental Protection Agency (EPA) of municipal storm sewers and construction sites for regulation under Clean Water Act (CWA), whereby National Pollutant Discharge Elimination System (NPDES) permits would be required for discharges by such entities, since association and municipalities were able to allege procedural harm from purported lack of notice or from effects of regulation itself. Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., [33 U.S.C.A. § 1251 et seq.](#)

[Cases that cite this headnote](#)

[24] Environmental Law  [Discharge of pollutants](#)

Designation by Environmental Protection Agency (EPA) of municipal storm sewers to be subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements, according to areas defined by Census Bureau as "urbanized," was not arbitrary and capricious, as would violate Clean Water Act (CWA), since EPA articulated reasoned basis for its conclusion that Census Bureau's designation was correlated to actual levels of pollution runoff in storm water; record evidence demonstrated compelling and widespread relationship between urban storm water runoff and deleterious impacts on water quality. Federal Water Pollution Control Act Amendments of 1972, § 402(p), [33 U.S.C.A. § 1342\(p\)](#).

[5 Cases that cite this headnote](#)

[25] Environmental Law  **Discharge of pollutants**

Decision by Environmental Protection Agency (EPA) to subject construction sites disturbing between one and five acres of land to National Pollutant Discharge Elimination System (NPDES) permitting requirements was not arbitrary and capricious, as would violate Clean Water Act (CWA); record evidence included numerous studies of sedimentation from construction sites, which EPA specifically reviewed in promulgating challenged regulation, and EPA's extrapolation of data from studies involving larger sites had reasonable basis. Federal Water Pollution Control Act Amendments of 1972, § 402(p), 33 U.S.C.A. § 1342(p).

[10 Cases that cite this headnote](#)

[26] Environmental Law  **Discharge of pollutants**

Allowance by Environmental Protection Agency (EPA) of regulatory waivers for small construction sites not likely to cause adverse water quality impacts, as would exempt such sites from National Pollutant Discharge Elimination System (NPDES) permit requirements, was not arbitrary and capricious, as would violate Clean Water Act (CWA); EPA's waiver approach promoted fairness and efficiency in permitting process, and did not create presumption applicable to evidentiary hearing. Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., 33 U.S.C.A. § 1251 et seq.

[Cases that cite this headnote](#)

[27] Environmental Law  **Discharge of pollutants**

Decision by Environmental Protection Agency (EPA) to subject small construction sites to National Pollutant Discharge Elimination System (NPDES) permitting requirements was consistent with its decisions to exempt other potential storm water runoff sources from such requirements, notwithstanding alleged lack of quantifiable data regarding runoff, and thus was not arbitrary and capricious, as would violate Clean Water Act (CWA); record evidence demonstrated that construction sites of all sizes had greater erosion rates than almost any other land use, and thus were not similarly situated to potential polluters that EPA chose not to regulate. Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., 33 U.S.C.A. § 1251 et seq.

[4 Cases that cite this headnote](#)

[28] Environmental Law  **Substances, Sources, and Activities Regulated**

Language in Clean Water Act (CWA) conferring authority to Environmental Protection Agency (EPA) to regulate "a discharge" determined to threaten water quality does not preclude EPA from designating entire categories of discharge sources for regulation. Federal Water Pollution Control Act Amendments of 1972, § 402(p), 33 U.S.C.A. § 1342(p).

[4 Cases that cite this headnote](#)

[29] Environmental Law  **Discharge of pollutants**

Residual designation authority retained by Environmental Protection Agency (EPA) for subjecting storm water discharge sites to future regulation under National Pollutant Discharge Elimination System (NPDES) permitting system was not ultra vires as to Clean Water Act (CWA); applicable statutory sections authorized designation of class of discharges to be identified on case-by-case, location-specific bases by NPDES permitting authority, consistent with comprehensive program to protect water quality. Federal Water Pollution Control Act Amendments of 1972, § 402(p), 33 U.S.C.A. § 1342(p).

[3 Cases that cite this headnote](#)

[30] **Constitutional Law** 🔑 Environment and natural resources

Environmental Law 🔑 Discharge of pollutants

Residual designation authority retained by Environmental Protection Agency (EPA) for subjecting storm water discharge sites to future regulation under National Pollutant Discharge Elimination System (NPDES) permitting system under Clean Water Act (CWA) did not effect unconstitutional delegation of legislative power, since such authority manifested statutory directive to restore and maintain chemical, physical and biological integrity of national waters. [U.S.C.A. Const. Art. 1, § 1](#); Federal Water Pollution Control Act Amendments of 1972, § 402(p), [33 U.S.C.A. § 1342\(p\)](#).

[1 Cases that cite this headnote](#)

[31] **Environmental Law** 🔑 Notice and comment

Environmental Protection Agency (EPA) provided proper notice and comment for rule allowing agency to retain residual designation authority subjecting categories of storm water discharge sites to future regulation under National Pollutant Discharge Elimination System (NPDES) permitting system under Clean Water Act (CWA), even though proposed rule would have only allowed such designation on case-by-case basis, since final rule was logical outgrowth of comments received by EPA; elements in proposed rule explicitly envisioned categorical designation of sources at watershed level. Federal Water Pollution Control Act Amendments of 1972, § 402(p), [33 U.S.C.A. § 1342\(p\)](#).

[4 Cases that cite this headnote](#)

[32] **Administrative Law and Procedure** 🔑 Economic or social impact statement

Under Regulatory Flexibility Act (RFA), federal agency must prepare regulatory flexibility analysis and assessment of economic impact of proposed rule on small business entities, unless agency certifies that proposed rule will not have significant economic impact on a substantial number of small entities, and provides a factual basis for that certification. [5 U.S.C.A. § 604](#).

[4 Cases that cite this headnote](#)

[33] **Environmental Law** 🔑 Permit and certification proceedings

Environmental Protection Agency (EPA), in promulgating rule subjecting categories of storm water discharge sites to National Pollutant Discharge Elimination System (NPDES) permitting requirements under Clean Water Act (CWA), reasonably certified that rule would not have significant economic impact on small business entities, as required under Regulatory Flexibility Act (RFA); EPA convened small business advocacy review panel before publishing notice of proposed rule, and included provisions in rule designed to minimize impacts on such entities. [5 U.S.C.A. § 604](#); Federal Water Pollution Control Act Amendments of 1972, § 101 et seq., [33 U.S.C.A. § 1251 et seq.](#)

[3 Cases that cite this headnote](#)

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On Petition for Review of an Order of the Environmental Protection Agency. EPA No. Clean Water 40 CFR.

Before [BROWNING](#), [REINHARDT](#), and [TALLMAN](#), Circuit Judges.

Opinion by Judge [JAMES R. BROWNING](#); Partial Concurrence and Partial Dissent by Judge [TALLMAN](#).

ORDER AND OPINION

ORDER

The opinion and dissent filed in this case on January 14, 2003, and published at 319 F.3d 398 are vacated. They are replaced by the Opinion and Dissent filed today.

With the filing of the new Opinion and Dissent, the panel has voted to deny the petitions for rehearing and the petition for rehearing en banc. (Judge Tallman would grant the petition for rehearing filed by *840 the Environmental Protection Agency.) The full court has been advised of the new Opinion, new Dissent, and petition for rehearing en banc. No judge has requested a vote on the petition for rehearing en banc. [Fed. R.App. P. 35](#).

The petitions for rehearing and the petition for rehearing en banc are DENIED. The clerk is instructed not to accept for filing any new petitions for rehearing or petitions for rehearing en banc in this case.

Each party shall bear its own costs in this appeal.

OPINION

JAMES R. BROWNING, Circuit Judge.

Petitioners challenge a rule issued by the United States Environmental Protection Agency pursuant to the Clean Water Act, 33 U.S.C. §§ 1251–1387, to control pollutants introduced into the nation's waters by storm sewers.

Storm sewers drain rainwater and melted snow from developed areas into water bodies that can handle the excess flow. Draining stormwater picks up a variety of contaminants as it filters through soil and over pavement on its way to sewers. Sewers are also used on occasion as an easy (if illicit) means for the direct discharge of unwanted contaminants. Since storm sewer systems generally channel collected runoff into federally protected water bodies, they are subject to the controls of the Clean Water Act.

In October of 1999, after thirteen years in process, the Environmental Protection Agency (“EPA”) promulgated a final administrative rule (the “Phase II Rule”¹ or “the Rule”) under § 402(p) of the Clean Water Act, 33 U.S.C. § 1342(p), mandating that discharges from small municipal separate storm sewer systems and from construction sites between one and five acres in size be subject to the permitting requirements of the National Pollutant Discharge Elimination System (“NPDES”), 33 U.S.C. §§ 1311(a), 1342. EPA preserved authority to regulate other harmful stormwater discharges in the future.

In the three cases consolidated here, petitioners and intervenors challenge the Phase II Rule on twenty-two constitutional, statutory, and procedural grounds. We remand three aspects of the Rule concerning the issuance of notices of intent under the Rule's general permitting scheme, and a fourth aspect concerning the regulation of forest roads. We affirm the Rule against all other challenges.

I.

BACKGROUND

A. The Problem of Stormwater Runoff

Stormwater runoff is one of the most significant sources of water pollution in the nation, at times “comparable to, if not greater than, contamination from industrial and sewage sources.”² Storm sewer waters carry suspended metals, sediments, algae-promoting nutrients (nitrogen and phosphorus), floatable trash, used motor oil, raw sewage, pesticides, and other toxic contaminants into streams, rivers, lakes, *841 and estuaries across the United States.³ In 1985, three-quarters of the States cited urban stormwater runoff as a major cause of waterbody impairment, and forty percent reported construction site runoff as a major cause of impairment.⁴ Urban runoff has been named as the foremost cause of impairment of surveyed ocean waters.⁵ Among the sources of stormwater contamination are urban development, industrial facilities, construction sites, and illicit discharges and connections to storm sewer systems.⁶

B. Stormwater and the Clean Water Act

Congress enacted the Clean Water Act in 1948 to “restore and maintain the chemical, physical, and biological integrity of the Nation's waters.” 33 U.S.C. § 1251(a) (originally codified as the Federal Water Pollution Control Act, 62 Stat. 1155). The Clean Water Act prohibits the discharge of pollutants from a “point source”⁷ into the waters of the United States without a permit issued under the terms of the National Pollutant Discharge Elimination System, 33 U.S.C. §§ 1311(a),

1342, which requires dischargers to comply with technology-based pollution limitations (generally according to the “best available technology economically achievable,” or “BAT” standard). 33 U.S.C. § 1311(b)(2)(A). NPDES permits are issued by EPA or by States that have been authorized by EPA to act as NPDES permitting authorities. 33 U.S.C. § 1342(a)-(b). The permitting authority must make copies of all NPDES permits and permit applications available to the public, 33 U.S.C. §§ 1342(j), 1342(b)(3); state permitting authorities must provide EPA notice of each permit application, 33 U.S.C. § 1342(b)(4); and a permitting authority must provide an opportunity for a public hearing before issuing any permit, 33 U.S.C. §§ 1342(a)(1), 1342(b)(3); cf. 33 U.S.C. § 1251(e) (requiring public participation).

[1] [2] Storm sewers are established point sources subject to NPDES permitting requirements. *Natural Res. Def. Council v. Costle*, 568 F.2d 1369, 1379 (D.C.Cir.1977) (holding unlawful EPA's exemption of stormwater discharges from NPDES permitting requirements); *Natural Res. Def. Council v. EPA*, 966 F.2d 1292, 1295 (9th Cir.1992).⁸ In 1987, to better regulate pollution conveyed by stormwater runoff, Congress enacted Clean Water Act § 402(p), 33 U.S.C. § 1342(p), “Municipal and Industrial Stormwater Discharges.” Sections 402(p)(2) and 402(p)(3) mandate NPDES permits for stormwater discharges “associated with industrial activity,” discharges from large and medium-sized municipal storm sewer systems, and certain other discharges. Section 402(p)(4) sets out a timetable for promulgation of the first of a *842 two-phase overall program of stormwater regulation. *Id.* at § 1342(p)(2)-(4); *Natural Res. Def. Council*, 966 F.2d at 1296. In 1990, pursuant to § 402(p)(4), EPA issued the Phase I Rule regulating large discharge sources.⁹

C. The Phase II Stormwater Rule

In Clean Water Act § 402(p), Congress also directed a second stage of stormwater regulation by ordering EPA to identify and address sources of pollution not covered by the Phase I Rule. Section 402(p)(1) placed a temporary moratorium (expiring in 1994) on the permitting of other stormwater discharges pending the results of studies mandated in § 402(p)(5) to identify the sources and pollutant content of such discharges and to establish procedures and methods to control them as “necessary to mitigate impacts on water quality.” 33 U.S.C. § 1342(p)(5). Section 402(p)(6) required that EPA establish “a comprehensive program to regulate” these stormwater discharges “to protect water quality,” following the studies mandated in § 402(p)(5) and consultation with state and local officials. *Id.* at § 1342(p)(6).

EPA proposed the Phase II Rule in January of 1998.¹⁰ In October, 1999, Congress passed legislation precluding EPA from promulgating the new Rule until EPA submitted an additional report to Congress supporting certain anticipated aspects of the Rule.¹¹ EPA was also required to publish its report in the Federal Register for public comment. *Pub. L. No. 106-74*, § 431(c), 113 Stat. at 1097. Later that month, EPA submitted the required (“Appropriations Act”) study and promulgated the Rule.¹²

Under the Phase II Rule, NPDES permits are required for discharges from small municipal separate storm sewer systems (“small MS4s”) and stormwater discharges from construction activity disturbing between one and five acres (“small construction sites”). 40 C.F.R. §§ 122.26(a)(9)(i)(A)-(B). Small MS4s may seek permission to discharge by submitting an individualized set of best-management plans in six specified categories, *id.* at § 122.34, either in the form of an individual permit application, or in the form of a notice of intent to comply with a general permit. *Id.* at § 122.33(b). Small MS4s may also seek permission to discharge through an alternative process, under which a permit may be sought without requiring the operator to regulate third parties, *id.* at §§ 122.33(b)(2)(ii), 122.26(d).¹³ Small construction sites may *843 apply for individual NPDES permits or seek coverage under a promulgated general permit. *Id.* at § 122.26(c). EPA also preserved authority to regulate other categories of harmful stormwater discharges on a regional, as-needed basis. *Id.* at § 122.26(a)(9)(i)(C)-(D).

D. Facial Challenges to the Phase II Rule

The Rule was challenged in the Fifth, Ninth, and D.C. Circuits in three separate actions ultimately consolidated before the Ninth Circuit.

The Texas Cities Coalition on Stormwater and the Texas Counties Stormwater Coalition (collectively, “the Municipal Petitioners”) assert that EPA lacked authority to require permitting, that its promulgation of the Rule was procedurally defective, that the Rule establishes categories that are arbitrary and capricious, and that the Rule impermissibly requires municipalities to regulate their own citizens in contravention of the Tenth Amendment and to communicate a federally mandated message in contravention of the First Amendment. The Natural Resources Defense Council (“NRDC”) intervened on behalf of EPA.

Environmental Defense Center, joined by petitioner-intervenor NRDC (“the Environmental Petitioners”), asserts that the regulations fail to meet minimum Clean Water Act statutory requirements because they constitute a program of impermissible self-regulation, fail to provide required avenues of public participation, and neglect to address stormwater runoff associated with forest roads and other significant sources of runoff pollution.

The American Forest & Paper Association (“AF&PA”) and the National Association of Home Builders (“the Industrial Petitioners”) assert that promulgation of the Rule was procedurally defective and violated the Regulatory Flexibility Act, that EPA's retention of authority to regulate future sources of runoff pollution is *ultra vires*, and that the decision to regulate discharge from construction sites one to five acres in size is arbitrary and capricious. NRDC again intervened on behalf of EPA.

We have jurisdiction pursuant to section 509(b)(1) of the Clean Water Act, [33 U.S.C. § 1369\(b\)\(1\)](#) (assigning review of EPA effluent and permitting regulations to the Federal Courts of Appeals).

II.

DISCUSSION

A. The Permit Requirements

[3] The Municipal Petitioners' primary contention is that the Phase II Rule compels small MS4s to regulate citizens as a condition of receiving a permit to operate, and that EPA lacks both statutory and constitutional authority to impose such a requirement. Because we avoid considering constitutionality if an issue may be resolved on narrower grounds, [Greater New Orleans Broadcasting Ass'n v. United States](#), 527 U.S. 173, 184, 119 S.Ct. 1923, 144 L.Ed.2d 161 (1999), we first ask whether the Phase II Rule is supported by statutory authority.

1. Statutory Authority

[4] The Municipal Petitioners assert that the statutory command in Clean Water Act § 402(p)(6) that EPA develop a “comprehensive program to regulate” small MS4s did not authorize a program based on NPDES permits. Petitioners argue that because § 402(p)(6) explicitly indicates elements that the program may *844 contain (performance standards, guidelines, etc.) without mentioning “permits,” Congress must have intended that the program exclude permitting.¹⁴

The fact that “permitting” is not included on a statutory list of elements that the program “may” include is not determinative, because the list is manifestly nonexclusive. The only constraints are that the § 402(p)(6) regulations be based on the § 402(p)(5) studies, that they be issued in consultation with state and local officials, and that—“at a minimum”—they establish priorities, requirements for state stormwater management programs, and expeditious deadlines, and constitute a comprehensive program “to protect water quality.” [33 U.S.C. § 1342\(p\)\(6\)](#). EPA was free to adopt any regulatory program, including a permitting program, that included these elements. *See Chevron, U.S.A.*

v. Natural Res. Def. Council, 467 U.S. 837, 842–43, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984) (deference to an agency's reasonable interpretation is required unless Congress expressed its intent unambiguously). It is more reasonable to interpret congressional silence about permits as an indication of EPA's flexibility not to use them than as an outright prohibition.¹⁵

The Municipal Petitioners further contend that their interpretation is supported by the structure of § 402(p), which expressly requires permits for large and medium sized MS4s in a separate section, § 402(p)(3)(B).¹⁶ However, as EPA counters, the language in § 402(p)(3) requiring permits for municipal storm sewers may be interpreted to apply both to Phase I *and* Phase II MS4s. Moreover, as respondent-intervenor NRDC notes, the mere existence of the § 402(p)(1) permitting moratorium, designed to apply only to Phase II dischargers, necessarily implies that EPA has the authority to require permits from these sources after the 1994 expiration of the moratorium.

Since there would have been no need to establish a permitting moratorium for these sources if the sources could *never* be subject to permitting requirements, petitioners' interpretation violates the bedrock principle that statutes not be interpreted to render any provision superfluous. *See Burrey v. Pacific Gas & Elec. Co.*, 159 F.3d 388, 394 (9th Cir.1998). EPA's interpretation of its mandate under § 402(p)(6) was reasonable and EPA acted within its statutory authority in formulating the Phase II Rule as a permitting program.

2. The Tenth Amendment

The Municipal Petitioners contend that the Phase II Rule on its face compels *845 operators of small MS4s to regulate third parties in contravention of the Tenth Amendment. We conclude that the Rule does not violate the Tenth Amendment, because it directs no unconstitutional coercion.

The Phase II Rule contemplates several avenues through which a small MS4 may obtain permission to discharge. First, if the NPDES Permitting Authority overseeing the small MS4 has issued an applicable general permit, the small MS4 may submit a notice of intent wherein the small MS4 agrees to comply with the terms of the general permit and specifies plans for implementing six “Minimum Measures” designed to protect water quality. 40 C.F.R. §§ 122.33(b)(1), 122.34(d)(1)(i), 122.34(b). Second, the small MS4 may apply for an individual permit under 40 C.F.R. § 122.34, which would again require compliance with the six Minimum Measures. *Id.* at §§ 122.33(b)(2)(i), 122.34(a), 122.34(b). Third, under an “Alternative Permit” option, the small MS4 may apply for an individualized permit under 40 C.F.R. § 122.26(d), the permitting program established by the Phase I Rule for large and medium-sized MS4s. *Id.* at §§ 122.33(b)(2)(ii), 122.26(d).¹⁷

[5] The Minimum Measures mentioned above require small MS4s to implement programs for: (1) conducting public education and outreach on stormwater impacts, *id.* at § 122.34(b)(1); (2) engaging public participation in the development of stormwater management programs, *id.* at § 122.34(b)(2); (3) detecting and eliminating illicit discharges to the MS4, *id.* at § 122.34(b)(3); (4) reducing pollution to the MS4 from construction activities disturbing one acre or more, *id.* at § 122.34(b)(4); (5) minimizing water quality impacts from development and redevelopment activities that disturb one acre or more, *id.* at § 122.34(b)(5); and (6) preventing or reducing pollutant runoff from municipal activities, *id.* at § 122.34(b)(6).¹⁸

*846 The Municipal Petitioners contend that the measures regulating illicit discharges, small construction sites, and development activities unconstitutionally compel small MS4 operators to regulate third parties, *i.e.*, upstream dischargers. The Illicit Discharge Detection and Elimination measure requires that a permit seeker prohibit non-stormwater discharges to the MS4 and implement appropriate enforcement procedures. 40 C.F.R. § 122.34(b)(3)(ii)(B).¹⁹ The Construction Site Stormwater Runoff Control measure requires a permit seeker to implement and enforce a program to reduce stormwater pollutants from small construction sites. *Id.* at §§ 122.34(b)(4)(i)-(ii).²⁰ It mandates

erosion and sedimentation controls, site plan reviews that take account of water quality impacts, site inspections, and the consideration of public comment, and requires that construction site operators implement erosion, sedimentation, and waste management best management practices. *Id.* The Post-Construction/New Development measure requires permit seekers to address post-construction runoff from new development and redevelopment projects disturbing one acre or more. *Id.* at § 122.34(b)(5)(ii)(B).²¹

Noting that most MS4s are operated by municipal governments, and that “[t]he drainage of a city in the interest of the public health and welfare is one of the most important purposes for which the police power can be exercised,” *New Orleans Gaslight Co. v. Drainage Comm'n*, 197 U.S. 453, 460, 25 S.Ct. 471, 49 L.Ed. 831 (1905), the Municipal Petitioners argue that requiring operators of small MS4s to implement “through ordinance or other regulatory mechanism” the regulations required by the Minimum Measures contravenes the Tenth Amendment. *See, e.g., New York v. United States*, 505 U.S. 144, 188, 112 S.Ct. 2408, 120 L.Ed.2d 120 (1992).

EPA counters that the Phase II Rule does not violate the Tenth Amendment because operators of small MS4s may opt to avoid the Minimum Measures by seeking a permit under the Alternative Permit *847 option, 40 C.F.R. § 122.33(b)(2)(ii).²²

[6] [7] [8] Under the Tenth Amendment, “the Federal Government may not compel States to implement, by legislation or executive action, federal regulatory programs.” *Printz v. United States*, 521 U.S. 898, 925, 117 S.Ct. 2365, 138 L.Ed.2d 914 (1997); *see also New York*, 505 U.S. at 188, 112 S.Ct. 2408. Similarly, the federal government may not force the States to regulate third parties in furtherance of a federal program. *See Reno v. Condon*, 528 U.S. 141, 151, 120 S.Ct. 666, 145 L.Ed.2d 587 (2000) (upholding a federal statutory scheme because it “does not require the States in their sovereign capacity to regulate their own citizens”). These protections extend to municipalities. *See, e.g., Printz* 521 U.S. at 931 n. 15, 117 S.Ct. 2365.

[9] [10] However, while the federal government may not *compel* them to do so, it may *encourage* States and municipalities to implement federal regulatory programs. *See New York*, 505 U.S. at 166–68, 112 S.Ct. 2408. For example, the federal government may make certain federal funds available only to those States or municipalities that enact a given regulatory regime. *See, e.g., South Dakota v. Dole*, 483 U.S. 203, 205–08, 107 S.Ct. 2793, 97 L.Ed.2d 171 (1987) (upholding federal statute conditioning state receipt of federal highway funds on state adoption of minimum drinking age of twenty-one). The crucial proscribed element is coercion; the residents of the State or municipality must retain “the ultimate decision” as to whether or not the State or municipality will comply with the federal regulatory program. *New York*, 505 U.S. at 168, 112 S.Ct. 2408. However, as long as “the alternative to implementing a federal regulatory program does not offend the Constitution's guarantees of federalism, the fact that the alternative is difficult, expensive or otherwise unappealing is insufficient to establish a Tenth Amendment violation.” *City of Abilene v. EPA*, 325 F.3d 657, 662 (5th Cir.2003).

[11] With the Phase II Rule, EPA gave the operators of small MS4s a choice: either implement the regulatory program spelled out by the Minimum Measures described at 40 C.F.R. § 122.34(b), or pursue the Alternative Permit option and seek a permit under the Phase I Rule as described at 40 C.F.R. § 122.26(d). Thus, unless § 122.26(d) itself offends the Constitution's guarantees of federalism, the Phase II Rule does not violate the Tenth Amendment.

Pursuing a permit under the Alternative Permit option does require permit seekers, in their application for a permit to discharge, to propose management programs that address substantive concerns similar to those addressed by the Minimum Measures. *See* 40 C.F.R. § 122.26(d). However, § 122.26(d) lists the requirements for an *application* for a permit to discharge, not the requirements of the permit itself. Therefore, nothing in § 122.26(d) requires the operator of an MS4 to implement a federal regulatory program in order to receive a permit to discharge, because nothing in § 122.26(d) specifies the contents of the permit that will result from the application process.

City of Abilene, 325 F.3d 657, provides a helpful illustration. The cities of Abilene and Irving, Texas, have populations between 100,000 and 250,000, and so were *848 required to apply for permits under the Phase I Rule, 40 C.F.R. § 122.26(d). *City of Abilene*, 325 F.3d at 659–60. Under § 122.26(d) the cities were required to submit proposed stormwater management programs. *Id.* at 660. They negotiated the terms of those programs with EPA, and EPA eventually presented the cities with proposed management permits that contained conditions requiring the implementation of stormwater regulatory programs, and potentially requiring the regulation of third parties. *Id.* But, as the Fifth Circuit noted, this did not mean that the cities had no choice but to implement a federal regulatory program. Instead:

The Cities filed comments objecting to those conditions, and negotiations continued until the EPA offered the Cities the option of pursuing numeric end-of-pipe permits, which would have required the Cities to satisfy specific effluent limitations rather than implement management programs. The Cities declined this offer, electing to continue negotiations on the management permits.

Id. The Fifth Circuit rejected the cities' contention that the resulting permits violated the Tenth Amendment by requiring the cities to regulate third parties according to federal standards. *Id.* at 661–63. Because the cities chose to pursue the management permits despite the fact that EPA provided them with an option for obtaining permits that would not have involved implementing a management program or regulating third parties, no unconstitutional coercion occurred. *Id.* at 663. The ultimate decision to implement the federal program remained with the cities.

Any operator of a small MS4 that wishes to avoid the Minimum Measures may seek a permit under § 122.26(d), and, as *City of Abilene* demonstrates, nothing in § 122.26(d) will compel the operator of a small MS4 to implement a federal regulatory program or regulate third parties, because § 122.26(d) specifies application requirements, not permit requirements. Therefore, by presenting the option of seeking a permit under § 122.26(d), the Phase II Rule avoids any unconstitutional coercion. The Municipal Petitioners' claim that the Phase II Rule violates the Tenth Amendment therefore fails.

3. *The First Amendment and the Minimum Measures*

The Municipal Petitioners contend that the Public Education and Illicit Discharge Minimum Measures compel municipalities to deliver EPA's political message in violation of the First Amendment. The Phase II Rule's "Public Education and Outreach" Minimum Measure directs regulated small MS4s to "distribute educational materials to the community ... about the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff." 40 C.F.R. § 122.34(b)(1)(i). The "Illicit Discharge Detection and Elimination" measure requires regulated small MS4s to "[i]nform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste." 40 C.F.R. § 122.34(b)(3)(ii)(D).

[12] The Municipal Petitioners argue that the First Amendment prohibits EPA from compelling small MS4s to communicate messages that they might not otherwise wish to deliver. They further contend that EPA's interpretation of § 402(p) as authorizing these Measures does not warrant *Chevron* deference because it raises serious constitutional issues, but that even if deference were given, the resulting rule is unconstitutional because neither Congress nor EPA may dictate the speech of MS4s. They contend that municipalities are protected by the First Amendment, *849 *Pacific Gas & Elec. v. Public Utilities Comm'n*, 475 U.S. 1, 8, 106 S.Ct. 903, 89 L.Ed.2d 1 (1986) ("Corporations and other associations, like individuals, contribute to the [discourse] that the First Amendment seeks to foster...."), which applies as much to compelled statements of "fact" as to those of "opinion." *Riley v. Nat'l Fed. of the Blind*, 487 U.S. 781, 797–98, 108 S.Ct. 2667, 101 L.Ed.2d 669 (1988).

We conclude that the purpose of the challenged provisions is legitimate and consistent with the regulatory goals of the overall scheme of the Clean Water Act, *cf.* *Glickman v. Wileman Bros. & Elliott, Inc.*, 521 U.S. 457, 476, 117 S.Ct. 2130, 138 L.Ed.2d 585 (1997), and does not offend the First Amendment.²³ The State may not constitutionally require an individual to disseminate an ideological message, *Wooley v. Maynard*, 430 U.S. 705, 713, 97 S.Ct. 1428, 51 L.Ed.2d 752

(1977), but requiring a provider of storm sewers that discharge into national waters to educate the public about the impacts of stormwater discharge on water bodies and to inform affected parties, including the public, about the hazards of improper waste disposal falls short of compelling such speech.²⁴ These broad requirements do not dictate a specific message. They require appropriate educational and public information activities that need not include any specific speech at all. A regulation is facially unconstitutional only when every possible reading compels it, *Meinhold v. U.S. Dep't of Def.*, 34 F.3d 1469, 1476 (9th Cir.1994),²⁵ but this is clearly not the case here.

As in *Zauderer v. Office of Disciplinary Counsel of the Sup. Ct. of Ohio*, 471 U.S. 626, 105 S.Ct. 2265, 85 L.Ed.2d 652 (1985), where the Supreme Court upheld certain disclosure requirements in attorney advertising, “[t]he interests at stake in this case are not of the same order as those discussed in *Wooley* [invalidating a law requiring that drivers display the motto ‘Live Free or Die’ on New Hampshire license plates] ... and *Barnette* [forbidding the requirement that public school students salute the flag because the State may not impose on the individual ‘a ceremony so touching matters of opinion and political attitude’].” *Id.* at 651. EPA has not attempted to “prescribe what shall be orthodox in politics, nationalism, religion, or other matters of opinion or force citizens to confess by word or act their faith therein.” *West Virginia State Bd. of Ed. v. Barnette*, 319 U.S. 624, 642, 63 S.Ct. 1178, 87 L.Ed. 1628 (1943).

***850** Informing the public about safe toxin disposal is non-ideological; it involves no “compelled recitation of a message” and no “affirmation of belief.” *Prune Yard Shopping Ctr. v. Robins*, 447 U.S. 74, 88, 100 S.Ct. 2035, 64 L.Ed.2d 741 (1980) (upholding state law protecting petitioning in malls and noting that “*Barnette* is inapposite because it involved the compelled recitation of a message containing an affirmation of belief”). It does not prohibit the MS4 from stating its own views about the proper means of managing toxic materials, or even about the Phase II Rule itself. Nor is the MS4 prevented from identifying its dissemination of public information as required by federal law, or from making available federally produced informational materials on the subject and identifying them as such.

Even if such a loosely defined public information requirement could be read as compelling speech, the regulation resembles another regulation that the Supreme Court has held permissible. In *Glickman*, 521 U.S. 457, 117 S.Ct. 2130, 138 L.Ed.2d 585, the Court upheld a generic advertising assessment promulgated by the Department of Agriculture on behalf of California tree fruit growers because the order was consistent with an overall regulatory program that did not abridge protected speech:

Three characteristics of the regulatory scheme at issue distinguish it from laws that we have found to abridge the freedom of speech protected by the First Amendment. First, the marketing orders impose no restraint on the freedom of any producer to communicate any message to any audience. Second, they do not compel any person to engage in any actual or symbolic speech. Third, they do not compel the producers to endorse or to finance any political or ideological views. Indeed, since all of the respondents are engaged in the business of marketing California nectarines, plums, and peaches, it is fair to presume that they agree with the central message of the speech that is generated by the generic program.

Id. at 469–70, 117 S.Ct. 2130 (footnotes omitted). Here, as in *Glickman*, the Phase II regulations impose no restraint on the freedom of any MS4 to communicate any message to any audience. They do not compel any specific speech, nor do they compel endorsement of political or ideological views. And since all permittees are engaged in the handling of stormwater runoff that must be conveyed in reasonably unpolluted form to national waters, it is similarly fair to presume that they will agree with the central message of a public safety alert encouraging proper disposal of toxic materials.²⁶ The Phase II regulation departs only from the second element in the *Glickman* analysis, because the public information requirement may compel a ***851** regulated party to engage in some speech at some time; but unlike the offensive messages in *Maynard* and *Barnette* (and even the inoffensive advertising messages at issue in *Glickman*) that speech is not specified by the regulation.²⁷

The public information requirement does not impermissibly compel speech, and nothing else in the Phase II Rule offends the First Amendment.²⁸ The Rule does not compel a recitation of a specific message, let alone an affirmation of belief. To the extent MS4s are regulated by the public information requirement, the regulation is consistent with the overall regulatory program of the Clean Water Act and the responsibilities of point source dischargers.

4. Notice and Comment on the Alternative Permit Option

The Municipal Petitioners contend that, in adopting the Alternative Permit option, EPA did not comply with the minimum notice and comment procedures required in informal rulemaking by the Administrative Procedures Act (“APA”), 5 U.S.C. § 553. The APA requires an agency to publish notice of a proposed rulemaking that includes “either the terms or substance of the proposed rule or a description of the subjects and issues involved.” *Id.* at § 553(b)(3).

[13] We have held that a “final regulation that varies from the proposal, even substantially, will be valid as long as it is ‘in character with the original proposal and a logical outgrowth of the notice and comments.’” *Hodge v. Dalton*, 107 F.3d 705, 712 (9th Cir.1997). In determining whether notice was adequate, we consider whether the complaining party should have anticipated that a particular requirement might be imposed. The test is whether a new round of notice and comment would provide the first opportunity for interested parties to offer comments that could persuade the agency to modify its rule. *Am. Water Works Ass'n v. EPA*, 40 F.3d 1266, 1274 (D.C.Cir.1994).

The Municipal Petitioners argue that the Alternative Permit option is not a logical outgrowth of EPA's proposed rule because, although numerous alternatives were discussed in the Preamble to the proposed rule, 63 Fed. Reg. at 1554–1557, the Alternative Permit option eventually adopted was not. EPA counters that the proposed rule included a supplementary alternative permitting system based on concepts similar to those in the Minimum *852 Measures, including “simplified individual permit application requirements.”²⁹ EPA contends that the Alternative Permit option was a logical outgrowth of the comments it received on the proposal expressing concern that the Minimum Measures might violate the Tenth Amendment. 64 Fed. Reg. at 68,765.

[14] The Alternative Permit option passes the *Hodge* test. The proposed rule suggested an individualized permitting option to be developed in response to comments during the notice and comment period. The Alternative option contains no elements that were not part of the original rule, even if they are configured differently in the final rule. Petitioners had, and took, their opportunity to object to the aspects of the Rule that they did not support in their comments on the Minimum Measures.

B. The General Permit Option and Notices of Intent

The Environmental Petitioners contend that the general permitting scheme of the Phase II Rule allows regulated small MS4s to design stormwater pollution control programs without adequate regulatory and public oversight, and that it contravenes the Clean Water Act because it does not require EPA to review the content of dischargers' notices of intent and does not contain express requirements for public participation in the NPDES permitting process.

In reviewing a federal administrative agency's interpretation of a statute it administers, we first determine whether Congress has expressed its intent unambiguously on the question before the court. *See Chevron*, 467 U.S. 837, 842–44, 104 S.Ct. 2778, 81 L.Ed.2d 694 (“If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress.”). “If, instead, Congress has left a gap for the administrative agency to fill, we proceed to step two. At step two, we must uphold the administrative regulation unless it is arbitrary, capricious, or manifestly contrary to the statute.” *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1162, amended by 197 F.3d 1035 (9th Cir.1999) (citations and internal quotations omitted).

[15] We conclude that the Phase II General Permit option violates the Clean Water Act's requirement that permits for discharges “require controls to reduce the discharge of pollutants to the maximum extent practicable,” 33 U.S.C. § 1342(p)(3)(B)(iii). We also conclude that the Phase II General Permit option violates the Clean Water Act because it does not contain express requirements for public participation in the NPDES permitting process. We remand these aspects of the Phase II Rule.³⁰

***853 1. Phase II General Permits and Notices of Intent**

Primary responsibility for enforcement of the requirements of the Clean Water Act is vested in the Administrator of the EPA. 33 U.S.C. § 1251(d); see also 33 U.S.C. § 1361(a) (“The Administrator [of EPA] is authorized to prescribe such regulations as are necessary to carry out his functions under this chapter.”). The Clean Water Act renders illegal any discharge of pollutants not specifically authorized by a permit. 33 U.S.C. § 1311(a) (“Except in compliance with this section and [other sections detailing permitting requirements] of this title, the discharge of any pollutant by any person shall be unlawful.”). Under the Phase II Rule, dischargers may apply for an individualized permit with the relevant permitting authority, or may file a “Notice of Intent” (“NOI”) to seek coverage under a “general permit.” 40 C.F.R. § 122.33(b).

A general permit is a tool by which EPA regulates a large number of similar dischargers. Under the traditional general permitting model, each general permit identifies the output limitations and technology-based requirements necessary to adequately protect water quality from a class of dischargers. Those dischargers may then acquire permission to discharge under the Clean Water Act by filing NOIs, which embody each discharger's agreement to abide by the terms of the general permit. Because the NOI represents no more than a formal acceptance of terms elaborated elsewhere, EPA's approach does not require that permitting authorities review an NOI before the party who submitted the NOI is allowed to discharge. General permitting has long been recognized as a lawful means of authorizing discharges. *Natural Res. Def. Council v. Costle*, 568 F.2d 1369 (D.C.Cir.1977).

The Phase II general permitting scheme differs from the traditional general permitting model. The Clean Water Act requires EPA to ensure that operators of small MS4s “reduce the discharge of pollutants to the maximum extent practicable.” 33 U.S.C. § 1342(p)(3)(B). To ensure that operators of small MS4s achieve this “maximum extent practicable” standard, the Phase II Rule requires that each NOI contain information on an individualized pollution control program that addresses each of the six general criteria specified in the Minimum Measures; thus, according to the Phase II Rule, submitting an NOI and implementing the Minimum Measures it contains “constitutes compliance with the standard of reducing pollutants to the ‘maximum extent practicable.’ ” 40 C.F.R. § 122.34(a).

Because a Phase II NOI establishes what the discharger will do to reduce discharges to the “maximum extent practicable,” the Phase II NOI crosses the threshold from being an item of procedural correspondence to being a substantive component of a regulatory regime. The text of the Rule itself acknowledges that a Phase II NOI is a permit application that is, at least in some regards, functionally equivalent to a detailed application for an individualized permit. See, e.g., 40 C.F.R. § 122.34(d)(1) (“In your permit application (either a notice of intent for coverage under a general permit or an individual permit application), you must identify and submit to your NPDES permitting authority the following information....”). For this reason, EPA rejected the possibility of providing a “form NOI” to Phase II permittees, explaining that “[w]hat will be required on an MS4's NOI ... is more extensive than what is usually required on *854 an NOI, so a ‘form’ NOI for MS4s may be impractical.” 64 Fed. Reg. at 68,764.

2. Failure to Regulate

The Environmental Petitioners argue that, by allowing NPDES authorities to grant dischargers permits based on unreviewed NOIs, the Rule creates an impermissible self-regulatory system.³¹ Petitioners contend the Rule impermissibly fails to require that the permitting authority review an NOI to assure compliance with Clean Water Act

standards, including the standard that municipal stormwater pollution be reduced to “the maximum extent practicable.” 33 U.S.C. § 1342(p)(3)(B)(iii). See 40 C.F.R. § 123.35 (setting out requirements for permitting authorities, but not requiring review of NOI); 64 Fed. Reg. at 68,764 (“EPA disagrees that formal approval or disapproval by the permitting authority is needed”).

EPA maintains that the Phase II permit system is fully consistent with the authorizing statute. It contends that § 402(p)(6) granted EPA flexibility in designing the Phase II “comprehensive program,” and notes that while the statute does not require general permits, neither does it preclude them. EPA contends that Congress delegated the task of designing the program to EPA, and that EPA reasonably adopted a “flexible version” of the NPDES permit program to suit the unique needs of the Phase II program. It disputes that the general permit program creates “paper tigers,” especially since EPA, States, and citizens may initiate enforcement actions. Finally, EPA argues that the Rule does not create a self-regulatory program, but that even if it did, nothing in § 402(p)(6) precludes such a program.

Reviewing the Phase II Rule under the first step of *Chevron*, we note that the plain language of § 402(p) of the Clean Water Act, 33 U.S.C. § 1342(p), expresses unambiguously Congress's intent that EPA issue no permits to discharge from municipal storm sewers unless those permits “require controls to reduce the discharge of pollutants to the maximum extent practicable.”

Phase II general permits will likely impose requirements that ensure that operators of small MS4s comply with many of the standards of the Clean Water Act. Thus, general permits issued under Phase II will ordinarily contain numerous substantive requirements, just as did the permits issued under Phase I. See 40 C.F.R. §§ 123.35 & 123.35(a) (“§ 123.35 As the NPDES Permitting Authority for regulated small MS4s, what is my role? (a) You must comply with the requirements for all NPDES permitting authorities under Parts 122, 123, 124 and 125 of this chapter.”); see also 40 C.F.R. § 122.28 (outlining requirements for NPDES authorities issuing general permits). And every operator of a small MS4 who files an NOI under Phase II “must comply with other applicable NPDES permit requirements, standards, and conditions established in *855 the ... general permit.” See 40 C.F.R. §§ 122.34 & 122.34(f).

[16] However, while each Phase II general permit will likely ensure that operators of small MS4s comply with certain standards of the Clean Water Act, they will not “require controls to reduce the discharge of pollutants to the maximum extent practicable.” According to the Phase II Rule, the operator of a small MS4 has complied with the requirement of reducing discharges to the “maximum extent practicable” when it implements its stormwater management program, *i.e.*, when it implements its Minimum Measures. 40 C.F.R. § 122.34(a); see also 64 Fed. Reg. at 68753 (stating EPA's anticipation that limitations more stringent than the minimum control measures “will be unnecessary”). Nothing in the Phase II regulations requires that NPDES permitting authorities review these Minimum Measures to ensure that the measures that any given operator of a small MS4 has decided to undertake will *in fact* reduce discharges to the maximum extent practicable.³²

See 40 C.F.R. § 123.35 (“As the NPDES Permitting Authority for regulated small MS4s, what is my role?”). Therefore, under the Phase II Rule, nothing prevents the operator of a small MS4 from misunderstanding or misrepresenting its own stormwater situation and proposing a set of minimum measures for itself that would reduce discharges by far less than the maximum extent practicable.

In fact, under the Phase II Rule, in order to receive the protection of a general permit, the operator of a small MS4 needs to do nothing more than decide for itself what reduction in discharges would be the maximum practical reduction. No one will review that operator's decision to make sure that it was reasonable, or even good faith.³³ Therefore, as the Phase II Rule stands, EPA would allow permits to issue that would do less than *require* controls to reduce the discharge of pollutants to the maximum extent practicable.³⁴ See *856 64 Fed. Reg. at 68753 (explaining that the minimum control measures will protect water quality if they are “properly implemented”). We therefore must reject this aspect of

the Phase II Rule as contrary to the clear intent of Congress. *Cf. Natural Res. Def. Council*, 966 F.2d at 1305 (rejecting as arbitrary and capricious a permitting system that allowed regulated industrial stormwater dischargers to “self-report” whether they needed permit coverage).

Involving regulated parties in the development of individualized stormwater pollution control programs is a laudable step consistent with the directive to consult with state and local authorities in the development of the § 402(p)(6) comprehensive program. But EPA is still required to ensure that the individual programs adopted are consistent with the law. Our holding should not prevent the Phase II general permitting program from proceeding mostly as planned. Our holding does not preclude regulated parties from designing aspects of their own stormwater management programs, as contemplated under the Phase II Rule. However, stormwater management programs that are designed by regulated parties must, in every instance, be subject to meaningful review by an appropriate regulating entity to ensure that each such program reduces the discharge of pollutants to the maximum extent practicable. We therefore remand this aspect of the Rule.

3. Public Participation

The Environmental Petitioners contend that the Phase II Rule fails to provide for public participation as required by the Clean Water Act, because the public receives neither notice nor opportunity for hearing regarding an NOI. The EPA replies on the one hand by arguing that NOIs are not “permits” and therefore are not subject to the public availability and public hearing requirements of the Clean Water Act, and on the other hand by arguing that the combination of the public involvement minimum measure, 40 C.F.R. § 122.34(b)(2), the Federal Freedom of Information Act, 5 U.S.C. § 552, and state freedom of information acts would fulfill any such requirements if NOIs were permits.

Reviewing the Phase II Rule under *Chevron* step one, we conclude that clear Congressional intent requires that NOIs be subject to the Clean Water Act's public availability and public hearings requirements. The Clean Water Act requires that “[a] copy of each permit application and each permit issued under [the NPDES permitting program] shall be available to the public,” 33 U.S.C. § 1342(j), and that the public shall have an opportunity for a hearing before an permit application is approved, 33 U.S.C. § 1342(a)(1). Congress identified public participation rights as a critical means of advancing the goals of the Clean Water Act in its primary statement of the Act's approach and philosophy. *See* 33 U.S.C. § 1251(e); *see also Costle v. Pacific Legal Found.*, 445 U.S. 198, 216, 100 S.Ct. 1095, 63 L.Ed.2d 329 (1980) (noting the “general policy of encouraging public participation is applicable to the administration of the NPDES permit program”). EPA has acknowledged that technical issues relating to the issuance of NPDES permits should be decided in “the most open, accessible forum possible, *857 and at a stage where the [permitting authority] has the greatest flexibility to make appropriate modifications to the permit.” 44 Fed. Reg. 32,854, 32,885 (June 7, 1979).

As we noted above, under the Phase II Rule it is the NOIs, and not the general permits, that contain the substantive information about how the operator of a small MS4 will reduce discharges to the maximum extent practicable. Under the Phase II Rule, NOIs are functionally equivalent to the permit applications Congress envisioned when it created the Clean Water Act's public availability and public hearing requirements. Thus, if the Phase II Rule does not make NOIs “available to the public,” and does not provide for public hearings on NOIs, the Phase II Rule violates the clear intent of Congress. EPA's first argument—that NOIs are not subject to the public availability and public hearings requirements of the Clean Water Act—therefore fails.

We therefore reject the Phase II Rule as contrary to the clear intent of Congress insofar as it does not provide for public hearings on NOIs as required by 33 U.S.C. § 1342(a)(1). However, Congress has not directly addressed the question of what would constitute an NOI being “available to the public” as required by 33 U.S.C. § 1342(j). Under *Chevron* step two, we must defer to EPA's interpretation of “available to the public” unless it is arbitrary, capricious, or manifestly contrary to the statute.

[17] EPA argues that the NOIs are “available to the public” as a result of the combined effects of the public participation minimum measures, and of federal and state freedom of information acts. This argument is unconvincing. First, the public participation Minimum Measure only requires dischargers to design a program minimally consistent with State, Tribal, and local requirements. 40 C.F.R. § 122.34(b)(2). Second, the federal Freedom of Information Act only applies to documents that are actually in EPA's possession, not to documents that are in the possession of state or tribal NPDES authorities, *see* 40 C.F.R. § 2 (providing EPA's policy for releasing documents under the federal Freedom of Information Act), and nothing in the Phase II Rule provides that EPA obtain possession of every NOI that is submitted to a NPDES permitting authority. *See* 40 C.F.R. § 123.41(a) (making information provided to state NPDES authorities available to EPA only *upon request*). Thus, under the Phase II Rule, NOIs will only “be available to the public” subject to the vagaries of state and local freedom of information acts. We conclude that EPA's interpretation of 33 U.S.C. § 1342(j), as embodied in the provisions of the Phase II Rule providing for the public availability of NOIs, is manifestly contrary to the Clean Water Act, which contemplates greater scope, greater certainty, and greater uniformity of public availability than the Phase II Rule provides. We therefore reject this aspect of the Phase II Rule.³⁵

*858 In sum, we conclude that EPA's failure to require review of NOIs, which are the functional equivalents of permits under the Phase II General Permit option, and EPA's failure to make NOIs available to the public or subject to public hearings contravene the express requirements of the Clean Water Act. We therefore vacate those portions of the Phase II Rule that address these procedural issues relating to the issuance of NOIs under the Small MS4 General Permit option, and remand so that EPA may take appropriate action to comply with the Clean Water Act.

C. Failure to Designate

We reject the Environmental Petitioners' contention that EPA's failure to designate for Phase II regulation serious sources of stormwater pollution, including certain industrial (“Group A”) sources and forest roads, was arbitrary and capricious. *See Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 378, 109 S.Ct. 1851, 104 L.Ed.2d 377 (1989).³⁶

1. “Group A” Facilities

In addition to the small MS4s and construction sites ultimately designated for regulation under the Phase II Rule, EPA evaluated a variety of other point-source discharge categories for potential Phase II regulation. One group of dischargers (referred to as the “Group A” facilities) included sources that “are very similar, or identical” to regulated stormwater discharges associated with industrial activity that were not designated for Phase I regulation for administrative reasons unrelated to their environmental impacts.³⁷ 64 Fed. Reg. at 68,779. EPA estimates that Group A includes approximately 100,000 facilities, including auxiliary facilities and secondary activities (“*e.g.*, maintenance of construction equipment and vehicles, local trucking for an unregulated facility such as a grocery store,” *id.*) and facilities intentionally omitted from Phase I designation (“*e.g.*, publicly owned treatment works with a design flow of less than 1 million gallons per day, landfills that have not received industrial waste,” *id.*).

*859 The Environmental Petitioners contend that EPA should have designated the Group A facilities for categorical Phase II regulation after finding (1) that stormwater discharges from these facilities are the same as those from the industrial sources regulated under Phase I, and (2) that such discharges may cause “adverse water quality impacts.” *Id.* Petitioners argue that these findings, and EPA's failure to provide individualized analysis regarding whether any specific source category within Group A requires regulation, render EPA's decision not to regulate any of these sources under the Rule arbitrary and capricious. They maintain that EPA's “line-drawing,” which regulates some pollution sources but leaves nearly identical sources unregulated without any persuasive rationale, is necessarily arbitrary and capricious. *See Natural Res. Def. Council*, 966 F.2d at 1306 (EPA's decision not to regulate construction sites smaller than five acres was arbitrary when EPA provided no data to justify the five-acre threshold and admitted that unregulated sites could have significant water quality impacts).

Petitioners argue that § 402(p)(6) at least required EPA to make findings with respect to individual Group A categories, and that data collected from Phase I permit applications could be used to evaluate the pollutant potential of the identical Group A sources. They contend that these findings should have sufficed as a basis for designating at least some Group A sources, and that EPA's conclusion that it lacked adequate nationwide data upon which to designate any of these sources is not supported by the record evidence. Comparing EPA's identification of the serious polluting potential of some of these sources with its statutory mandate under § 402(p)(6) "to protect water quality," they argue that EPA fails even the forgiving standard of arbitrary and capricious review in that it has "offered an explanation for its decision that runs counter to the evidence before [it]" and "is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." See *Motor Vehicle Mfrs.*, 463 U.S. at 43, 103 S.Ct. 2856.

EPA maintains that it considered Group A facilities' similarity to already regulated sources as only one of several criteria that it used in designating sources for regulation under Phase II, 64 Fed. Reg. at 68,780, and that sources that appear "similarly situated" under one criterion are not necessarily similarly situated under all. EPA asserts that nothing in § 402(p)(6) implied a responsibility to make individualized findings regarding each Group A subcategory, and it maintains that it simply lacked sufficient data to support nationwide designation of the Group A facilities. EPA notes that, after failing to receive requested comment providing such data, it proposed instead "to protect water quality" by allowing regional regulation of problem Group A facilities under the residual designation authority. EPA contends that agencies must be afforded deference in determining the data necessary to support regulatory decisionmaking and that it reasonably determined the quantum of data it would need to support the designation of additional sources on a nationwide basis. See *Sierra Club v. EPA*, 167 F.3d 658, 662 (D.C.Cir.1999).

[18] We conclude that sufficient evidence supports EPA's decision not to designate Group A sources on a nationwide basis, and instead to establish local and regional designation authority to account for these sources and protect water quality. Although we are troubled by the purely administrative basis for the distinction between facilities regulated under the Phase I Rule and the Group A facilities *860 that remain unregulated under Phase II,³⁸ EPA's choice of the Phase I standard for designation is not the issue before us. Before us is whether EPA acted arbitrarily in declining to designate the Group A sources on a nationwide basis under the Phase II Rule, and we cannot say that it did.

EPA has articulated a rational connection between record facts indicating insufficient data to categorically regulate Group A facilities and its corresponding conclusion not to do so, and we defer to that decision. See *Washington v. Daley*, 173 F.3d 1158, 1169 (9th Cir.1999). In the text of the Rule, EPA explains that the process behind its decision not to nationally designate Group A sources for Phase II regulation focused not only on the likelihood of contamination from a source category, but also on the sufficiency of national data about each category and whether pollution concerns were adequately addressed by existing environmental regulations.³⁹ We cannot say that EPA relied on factors Congress had not intended it to consider, that it failed to consider an important aspect of the problem, or that its rationale is implausible. See *Motor Vehicle Mfrs.*, 463 U.S. at 43, 103 S.Ct. 2856. Nor did EPA's decision run counter to the evidence before it. *Id.* The Environmental Petitioners allege that its decision not to regulate Group A facilities runs counter to evidence that similar sources are highly polluting, but as EPA considered evidence beyond those similarities that persuaded it not to regulate, we cannot say that EPA's decision is unsupported by the record. Nothing in § 402(p)(6) unambiguously requires EPA to evaluate the Group A source categories individually, and we defer to EPA's interpretation of the statute it is charged with administering. See *Royal Foods Co. v. RJR Holdings*, 252 F.3d 1102, 1106 (9th Cir.2001).

2. Forest Roads

The Environmental Petitioners also contend that EPA arbitrarily failed to regulate forest roads under the Rule despite clear evidence in the record documenting the need for stormwater pollution control *861 of drainage from these roads. Petitioners again contend that this agency action is arbitrary, because EPA has offered an explanation for its decision that runs counter to the evidence before it.

Petitioners point to EPA's own conclusion that forest roads "are considered to be the major source of erosion from forested lands, contributing up to 90 percent of the total sediment production from forestry operations."⁴⁰ They note that both unimproved forest roads and construction sites create large expanses of non-vegetated soil subject to stormwater erosion, and argue that construction site data thus also support regulation of forest roads. Petitioners observe that EPA has cited no contrary evidence indicating that forest roads are not sources of stormwater pollutant discharges to U.S. waters, and they argue that Phase II regulation is necessary "to protect water quality," because proper planning and road design can minimize erosion and prevent stream sedimentation. Petitioners note that this court has previously held that, in the absence of such "supportable facts," EPA is not entitled to the usual assumption that it has "rationally exercised the duties delegated to it by Congress." *Natural Res. Def. Council*, 966 F.2d at 1305.

[19] EPA's response is that we have no jurisdiction to hear this challenge, chiefly because, it believes, the challenge is time-barred by Clean Water Act § 509(b)(1), 33 U.S.C. § 1369(b)(1) (providing that "application for review shall be made within 120 days from the date of [agency action]"). EPA promulgated silviculture regulations in 1976 that exclude from NPDES permit requirements certain silvicultural activities that EPA determined constitute non-point source activities, including "surface drainage, or road construction and maintenance from which there is natural runoff." 40 C.F.R. § 122.27(b)(1).⁴¹ EPA asserts that the exclusion applies to forest roads in general, not only to "construction" and "maintenance"—an assertion disputed by Petitioners—and that any challenge to the decision not to regulate forest roads should have been brought within 120 days of the promulgation of that rule. *See* 33 U.S.C. § 1369(b)(1).

EPA's argument might be more persuasive if Petitioners' contention could be understood essentially as a direct challenge to the 1976 silviculture regulations, but this is not the case. Even were we to assume that EPA exempted forest roads from NPDES permit requirements in 1976 under 40 C.F.R. § 122.27(b)(1), that would not resolve the question whether EPA should have addressed forest roads in its "comprehensive program ... to protect *862 water quality" under § 402(p)(6), because § 402(p)(6) was not enacted until 1987. Petitioners challenge EPA's decision not to regulate under the new portion of the statute, not the decision not to regulate under other provisions that were in effect earlier.

EPA argues in the alternative that Petitioners should have sought judicial review when EPA considered amending § 122.27(b)(1)—to delete the language that it asserts renders forest roads non-point sources—but then determined not to make the amendment. However, we are aware of no statute or legal doctrine providing that a party's failure to challenge an agency's decision *not* to amend its rules in one proceeding deprives the party of the right to challenge, in a contemporaneous proceeding, the promulgation of an entire new rule which could have, but did not, provide the full relief the party seeks. Assuming that EPA is correct that § 122.27(b)(1) defines forest roads as non-point sources, both the Phase II Rule proceedings and the proceedings in which the proposed amendment to § 122.27(b)(1) was considered and rejected were proper proceedings in which to raise the issue whether discharges from forest roads should be regulated. Petitioners chose to raise the issue in their comments to the proposed Phase II Rule, because they believed that Clean Water Act § 402(p)(6) mandates the regulation of forest roads. They did not lose their right to challenge the final Phase II Rule's failure to regulate forest roads simply because they did not also raise a challenge to EPA's failure to adopt an amendment to § 122.27(b)(1) that the agency initially proposed. (We note, incidentally, that it appears that even a successful challenge to § 122.27(b)(1) would likely not have achieved the objective the Environmental Petitioners sought: it would only have allowed case-by-case coverage for forest roads, and not for overall coverage.)

[20] Finally, EPA suggests that Petitioners' comments during the Phase II rulemaking process were too short to create jurisdiction in this court to hear this challenge. However, EPA exaggerates the slightness of those comments, which comprised two paragraphs, with footnotes, stating objections and providing support. We also agree with Petitioners that EPA was aware of the forest road sedimentation problem at the time of the rulemaking.⁴² Indeed, EPA responded to the comments without disputing that the problem is serious. 3 EPA, *Response to Public Comments* 8 (Oct. 29, 1999).

Rather, the agency relied on [40 C.F.R. § 122.27\(b\)\(1\)](#), indicating that it was barred from acting under the Phase II Rule by [§ 122.27\(b\)\(1\)](#).

EPA does not seriously address the merits of Petitioners' objections to the Rule in its brief to this court. Instead, EPA relies almost entirely on its assertion that we lack jurisdiction to decide this question. It does, however, strongly imply that its failure to adopt its own proposed amendment in the proceeding pertaining to [§ 122.27\(b\)\(1\)](#) relieves it of its obligation to consider including forest roads in the Phase II Rule proceedings. We reject any such contention. Petitioners' assertion that [§ 402\(p\)\(6\)](#) requires that the Phase II Rule contain provisions regulating forest roads necessitates a response from EPA on the merits.

***863** Having concluded that the objections of the Environmental Petitioners are not time-barred, and that we have jurisdiction to hear them, but that EPA failed to consider those objections on the merits, we remand this issue to the EPA, so that it may consider in an appropriate proceeding Petitioners' contention that [§ 402\(p\)\(6\)](#) requires EPA to regulate forest roads. EPA may then either accept Petitioners' arguments in whole or in part, or reject them on the basis of valid reasons that are adequately set forth to permit judicial review.

D. AF&PA's Standing

The American Forestry & Paper Association (AF&PA), a national trade association representing the forest, pulp, paperboard, and wood products industry, is one of the two Industry Petitioners asserting the remaining claims.⁴³ Before considering these challenges, however, we consider whether AF&PA has standing to raise them.

EPA argues that AF&PA lacks standing because it cannot show that it represents entities that suffer a cognizable injury under the Phase II Rule as promulgated. EPA argues that the interests of AF&PA entities might have supported standing had EPA decided to regulate forest roads as Phase II stormwater dischargers, but since EPA declined to do so, none of AF&PA's members are currently subject to the Rule. AF&PA contends that its members have a cognizable legal interest in the Rule because they risk becoming subject to regulation at any future time under the continuing designation authority.

[21] We agree that AF&PA lacks standing. A claimant meeting Article III standing requirements must show that “(1) it has suffered an ‘injury in fact’ ...; (2) the injury is fairly traceable to the challenged action of the defendant; and (3) it is likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision.” *Friends of the Earth v. Laidlaw Envtl. Servs. (TOC)*, 528 U.S. 167, 180–81, 120 S.Ct. 693, 145 L.Ed.2d 610 (2000). Standing requires an injury that is “actual or imminent, not ‘conjectural or hypothetical.’” *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560, 112 S.Ct. 2130, 119 L.Ed.2d 351 (1992). AF&PA's interest in avoiding future regulation of forest roads is not actually or imminently threatened by any potential result in this case. No ripe claim about misuse of the residual authority to regulate forest road discharge, or any other kind of discharge, is before the court. Should members of AF&PA become subject to Phase II regulation through subsequent administrative action, it will have standing to challenge those actions at that time. In the meanwhile, we proceed to the merits of the remaining claims on behalf of AF&PA's co-petitioner, the National Association of Home Builders, which has established its standing to raise them.

E. Consultation with State and Local Officials

The Industry Petitioners contend that EPA failed to consult with the States on the Phase II Rule as required by [§ 402\(p\)\(5\)](#), which instructs EPA to conduct studies “in consultation with the States,” and [§ 402\(p\)\(6\)](#), which instructs the Administrator to issue regulations based on these studies “in consultation with State and local officials.” 33 U.S.C. [§ 1342\(p\)\(5\)-\(6\)](#). We conclude that EPA satisfied its statutory duty of consultation. See *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851.

*864 Petitioners concede several instances in which EPA circulated drafts of the Phase II Rule to state and local authorities, but argue that these consultations were meaningless because (1) the reports were circulated too far in advance of the actual rulemaking, (2) the rulemaking wrongfully proceeded based on other sources of input, (3) standard APA notice and comment procedures could not suffice because Congress must have intended something more when it added the consultation requirements to the language of § 402, and (4) consultation at the final stage of rulemaking was inadequate because comment was sought on the final report only after it had been submitted to Congress and the Phase II Rule had been promulgated. Petitioners provide examples of state feedback that allegedly went unheeded by EPA in its promulgation of the final Rule.

EPA maintains that it consulted extensively with States and localities in developing the Phase II Rule, discharging its obligations under §§ 402(p)(5) & (6). EPA contends that the comments Petitioners cite as unheeded by EPA demonstrate that EPA *did* consult with States concerning the Rule, even if some States did not concur in EPA's ultimate conclusion, and that the final rule adopted a good measure of the flexibility sought by state representatives. EPA argues that Industry Petitioners cannot complain that consultation was inadequate simply because it did not result in the adoption of Petitioners' preferred views.

EPA also disputes Petitioners' allegation that while EPA did comply with the terms of the 1999 Appropriations Act (requiring EPA to defend the proposed Phase II Rule before Congress and then publish the final report for public comment), it demonstrated its failure to adequately consult by publishing the report for public comment *after* the Phase II Rule had been formally promulgated, rendering any subsequent public comment meaningless. EPA counters that these actions do not indicate that it failed to satisfy Congress's directive that it consult with state and local officials, because EPA had engaged in extensive consultation before Congress requested the Appropriations Act report, and Congress did not require further consultation when it conditioned promulgation of the Rule only on the submission of this final report. EPA claims that while Congress required it to publish the report after its submission, public comment on the report was not required before promulgation, and that the statutory deadline structure rendered any other interpretation impossible.

[22] We conclude that the overall record indicates EPA met its statutory duty of consultation. A draft of the first report was circulated to States, EPA regional offices, the Association of State and Interstate Water Pollution Control Administrators (“ASIWPCA”), and other stakeholders in November, 1993, and was revised based on comments received. EPA established the Urban Wet Weather Flows Federal Advisory Committee (“FACA Committee”), balancing membership between EPA's various outside stakeholder interests, including representatives from States, municipalities, Tribes, commercial and industrial sectors, agriculture, and environmental and public interest groups. 64 Fed. Reg. 68,724. The 32 members of the Phase II FACA Subcommittee, reflecting the same balance of interests, met fourteen times over three years and state and municipal representatives provided substantial input regarding the draft reports, the ultimate Phase II Rule, and the supporting data.⁴⁴ *Id.* EPA *865 instituted the Phase II Subcommittee meetings in addition to the standard APA notice and comment procedures, which EPA also followed.

The fact that the Rule did not conform to Petitioners' hopes and expectations does not bear on whether EPA adequately consulted state and local officials. Although required to consult with States and localities, EPA was free to chart the substantive course it saw fit. EPA was not required to consult with States on the Appropriations Act report. Even if EPA should have sought further comment at that late stage, failure to do so does not outweigh the evidence demonstrating extensive consultation and cooperation with local authorities on development of the Rule.

F. Designation of Certain Small MS4s and Construction Sites

The Industry Petitioners contend that, in designating certain small MS4s and construction sites for regulation under the Phase II Rule, EPA failed to adhere to the statutorily required regulatory basis and misinterpreted record evidence. We disagree.

1. Regulatory Basis

The Industry Petitioners and the Municipal Petitioners contend that EPA violated the statutory command to base the Phase II regulations on § 402(p)(5) studies. We review EPA's interpretation of its statutory authority under the *Chevron* standard, 467 U.S. at 842–44, 104 S.Ct. 2778, and affirm.

Petitioners argue that the studies mandated by § 402(p)(5) were intended to provide the sole substantive basis for the “comprehensive program” envisioned in § 402(p)(6), but that EPA also (and thus improperly) based its designation of small MS4s and construction sites on (1) public comment received in the aftermath of judicial invalidation of the scope of construction sites regulated by the Phase I Rule,⁴⁵ and (2) additional research discussed in the Preamble to the Phase II Rule.⁴⁶

EPA contends that the statute did not require it to base its designations exclusively on the § 402(p)(5) studies, and that it was in fact required to take account of information from other sources in promulgating the regulations. It argues that it based the Phase II Rule on conclusions reported in the § 402(p)(5) studies, but then appropriately supported these results with data described in the additional study requested by Congress in the Appropriations Act, comments submitted during the statutorily required notice-and-comment process, and other available information. To read the authorizing statute as limiting reliance to the § 402(p)(5) studies, EPA claims, would preclude it from relying on recommendations received through the separate, post-study requirement to “consult with State and local officials” under *866 § 402(p)(6), and through the notice and comment process mandated by the APA, 5 U.S.C. § 553(b).

Respondent-intervenor NRDC adds that the Phase II Rule is consistent with the § 402(p)(5) studies reported in 1995, and moreover, that the Industry Petitioners lack standing to raise the “regulatory basis” claim because they cannot show the requisite injury. See *Friends of the Earth*, 528 U.S. at 180–81, 120 S.Ct. 693.

a. Standing. Industry Petitioners⁴⁷ contend that they have suffered injury in fact, because their members are now either automatically regulated by the permitting requirements or subject to future regulation (under the residual authority, discussed below) that otherwise would not have been authorized, and that this is a direct result of EPA's failure to adhere to the framework of the 1995 Report, which allegedly would have precluded these aspects of the Rule. NRDC contends that the Industry Petitioners lack standing because they cannot show that being subject to NPDES permitting is the causal result of the procedural injury they urge, and because they cannot base standing on hypothetical injury that may arise in the future.

NRDC argues that the injuries Petitioners allege are not consistent with the guidelines laid out in *Friends of the Earth*, 528 U.S. at 180–81, 120 S.Ct. 693. It insists that Petitioners' only possible claims of injury from the alleged “regulatory basis” violation are purported harm to members caused by the final Phase II Rule itself or harm to members caused by EPA's alleged failure to provide adequate notice of future regulatory requirements in the 1995 Report. However, NRDC contends that Petitioners have not suffered the requisite injury, because they had actual notice that EPA might regulate small construction sites, 63 Fed. Reg. at 1583, and they can show no chain of causation linking their alleged injury from the Rule itself to the actions challenged here.

NRDC's causation argument is complex. Although the Petitioners purport to challenge EPA's failure to follow all of the 1995 Report's recommendations in the final Phase II Rule, NRDC contends, they are really challenging the subsequent proceedings through which EPA developed the final Rule. Even if there were some unlawful variance between the 1995 report and final rule, NRDC continues, the cause of that variance would have been some failure to abide by rulemaking standards during administrative proceedings that produced the text of the final Rule—not EPA's attention to sources of input other than the 1995 Report. NRDC maintains that these intervening acts of rulemaking (e.g., Phase II Subcommittee activities and the notice-and-comment process) break the requisite chain of causation between EPA's alleged failure to adhere to recommendations in the 1995 report and the flaws Petitioners allege in the Phase II Rule,

which NRDC claims would have been due to “purportedly unlawful EPA decisions on the merits during the subsequent administrative proceedings.” See *Northside Sanitary Landfill v. Thomas*, 804 F.2d 371, 381–84 (7th Cir.1986) (finding no standing to challenge EPA statements concerning the fate of a hazardous waste facility when subsequent state administrative acts, not EPA comments, would determine the facility's actual fate).

[23] We note that NRDC's standing arguments apply equally to the Municipal Petitioners, who can also assert only the *867 harms resulting to members from the Rule itself or from a lack of notice, and that we are thus not only considering the standing of the Industry Petitioners but also that of the Municipal Petitioners to raise the “regulatory basis” claim.⁴⁸ That established, we find standing for both.

NRDC essentially argues that petitioners lack standing because (1) they cannot show that being subject to NPDES permitting is the causal result of the procedural injury they urge, (2) they cannot claim any actual notice injury from the alleged procedural wrong because notice was actually given, and (3) they cannot claim standing based on hypothetical injury that may (or may not) arise from future regulation under the residual authority. We can readily agree with the latter two contentions. As discussed above, the “actual injury” requirement of Article III standing precludes judicial consideration of exactly the kind of hypothetical harm the Industry Petitioners allege may follow from use of Phase II authority for future designations of regional sources. *Friends of the Earth*, 528 U.S. at 180–81, 120 S.Ct. 693. If future Phase II designations cause identifiable injury to Petitioners, they will then be free to pursue that ripe claim. And because EPA clearly issued notice to all regulated parties that they may be subject to regulation under the proposed rule, 63 Fed. Reg. at 1568 (MS4s) and 1582 (construction), petitioners cannot show injury from lack of actual notice.

However, NRDC's causation argument is less persuasive. NRDC correctly argues that the petitioners cannot establish a definite chain of causation between the EPA's alleged failure to limit their regulatory basis to the § 402(p)(5) studies and the fact that they now must obtain permits. But this will almost always be true of petitions challenging an agency's failure to abide by statutory procedural requirements. Because all administrative decisionmaking following an alleged procedural irregularity could always be considered an intervening factor breaking the chain of causation, NRDC's interpretation of the requisite chain of causation would dubiously shield administrative decisions from procedural review.

For this reason, we have held that the failure of an administrative agency to comply with procedural requirements in itself establishes sufficient injury to confer standing, even though the administrative result might have been the same had proper procedure been followed. *City of Davis v. Coleman*, 521 F.2d 661, 671 (9th Cir.1975) (agency's failure to comply with National Environmental Policy Act's procedural requirements constituted injury sufficient to support standing of a geographically related plaintiff regardless of potentially similar regulatory outcome). In *City of Davis*, we noted that the standing inquiry represents “a broad test, but because the nature and scope of environmental consequences are often highly uncertain before study we think it an appropriate test.” *Id.* A plaintiff who shows that a causal relation is “probable” has standing, even if the chain cannot be definitively established. *Johnson v. Stuart*, 702 F.2d 193, 195–96 (9th Cir.1983) (school students and their parents had standing to challenge a statute that limited the texts that might be selected for teaching, even *868 though it could not be shown whether any specific book had been rejected under this statute or for other reasons).

The Supreme Court has also acknowledged that standing may be established by harm resulting indirectly from the challenged acts, *Warth v. Seldin*, 422 U.S. 490, 504–05, 95 S.Ct. 2197, 45 L.Ed.2d 343 (1975), and that causation may be established if the plaintiff shows a good probability that, absent the challenged action, the alleged harm would not have occurred, *Arlington Heights v. Metro. Hous. Dev. Corp.*, 429 U.S. 252, 262–64, 97 S.Ct. 555, 50 L.Ed.2d 450 (1977).

Thus, although the petitioners cannot show with certainty that the alleged “regulatory basis” violation caused them to be wrongfully subjected to Phase II permitting requirements, we hold that they have alleged a procedural injury sufficient to support their standing to bring the claim.

b. Merits. Although we resolve the standing issue in favor of the petitioners, we nevertheless affirm the Rule against their claim that EPA violated procedural constraints implied by the authorizing statute, § 402(p)(6).

Congress intended EPA to use all sources of information in developing a comprehensive program to protect water quality to the maximum extent practicable. The statute unambiguously required EPA to base its regulations both on the § 402(p)(5) studies and on consultation with state and local officials. Congress enacted § 402 with full knowledge that EPA would also be required to take account of public comments during the notice and comment phase of administrative rulemaking prescribed by the APA.⁴⁹

2. MS4s in Urbanized Areas

The Municipal Petitioners contend that the designation of small MS4s for Phase II regulation according to Census Bureau defined areas of population density (“urbanized areas”) is arbitrary and capricious. They argue that EPA has not established that the Census Bureau's designation of urbanized areas is correlated with actual levels of pollution runoff in stormwater, and that EPA adopted the designations simply for administrative convenience. We affirm, because the record reflects a reasoned basis for EPA's decision. See *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851.

Conceding that the Preamble cites studies purporting to establish “a high correlation between the degree of development/urbanization and adverse impacts on receiving waters due to stormwater,” 64 Fed. Reg. at 68,751, the Municipal Petitioners nevertheless contend that the record contains no “demonstrably correlated, *quantified* basis on which EPA may reasonably have concluded that any particular population, or any population density, *per se* establishes that all urban areas having that same characteristic in gross are necessarily appropriate for inclusion as Phase II sources.” Pointing to *Leather Industries of America v. EPA*, 40 F.3d 392, 401 (D.C.Cir.1994) (rejecting as arbitrary EPA's regulation of pollutant levels in the absence of data supporting a relationship between the caps and level of risk), Petitioners argue that EPA simply assumed the relationship Congress contemplated it would establish by the § 402(p)(5) studies.

EPA responds that it extensively documented the relationship between urbanization and harmful water quality impacts from stormwater runoff, pointing to its findings that the degree of surface imperviousness in an area directly corresponds *869 to the degree of harmful downstream pollution from stormwater runoff, 64 Fed. Reg. at 68,724–27, and that it articulated a rational connection between these record facts and its decision to designate small MS4s serving areas of high population density (“urbanized areas”) to protect water quality.

[24] We treat EPA's decision with great deference because we are reviewing the agency's technical analysis and judgments, based on an evaluation of complex scientific data within the agency's technical expertise. See *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103, 103 S.Ct. 2246, 76 L.Ed.2d 437 (1983); see also *Chem. Mfrs. Ass'n v. EPA*, 919 F.2d 158, 167 (D.C.Cir.1990) (“It is not the role of courts to ‘second-guess the scientific judgments of the EPA....’”). We conclude that the record supports EPA's choice.

The statute simply called upon EPA to “designate stormwater discharges,” other than those designated in Phase I, “to be regulated to protect water quality.” 33 U.S.C. § 1342(p)(6). EPA did so, based on record evidence showing a compelling and widespread correlation between urban stormwater runoff and deleterious impacts on water quality. Petitioners' assertion that EPA failed to establish a “quantified” basis for its designation is inapposite. The statute did not require EPA to establish with pinpoint precision a numeric population threshold within urbanized areas that would justify regulation under Phase II. In areas implicating technical expertise and judgment, courts do not require “perfect stud[ies]” or data. *Sierra Club*, 167 F.3d at 662. EPA satisfied the *Leather Industries* standard by adopting a threshold consistent with the criterion of “protecting water quality,” and did not assume, but instead sufficiently documented, the relationship between urbanization and harmful stormwater discharge.

3. Small Construction Sites

Industry and Municipal Petitioners also argue that EPA's decision to regulate under Phase II all construction sites disturbing between one and five acres of land ("small construction sites") is arbitrary and unsupported by the record. We do not agree. See *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851.

a. Record Evidence. Municipal Petitioners claim that EPA arrived at the one-acre standard based not on factual findings in the record but instead as a reaction to the earlier Ninth Circuit remand of the Phase I five-acre designation. They allege that the one-acre standard is no more based on supporting data than the rejected five-acre standard, and is thus quantitatively arbitrary.

Industry Petitioners argue that EPA's findings do not support regulation of *all* small construction sites, but indicate only that small construction sites, taken cumulatively, may cause effects similar to large sites in a given area. They contend that EPA's conclusion that adverse effects are possible under certain circumstances cannot support categorical designation of all small construction sites nationwide, and that the Rule is arbitrary because (1) it is based on an analysis that fails to take account of the frequency of negative impacts, (2) it fails to take account of acknowledged factors that determine whether small construction activities cumulatively cause harm (such as the degree of development in a watershed at any given time), and (3) EPA has acknowledged that the actual water quality impact of construction sites of all sizes varies widely from area to area depending on climatological, geological, geographical, *870 and hydrological influences.⁵⁰

Industry Petitioners further contend that the record does not support the designation of small sites, because almost all of the technical papers EPA relied on focused on larger sites or failed to take account of size,⁵¹ and because the lack of an adequate factual basis for nationwide regulation of small sites makes the Phase II Rule arbitrary and capricious. *Am. Petroleum Inst. v. EPA*, 216 F.3d 50, 58 (D.C.Cir.2000) (invalidating a solid waste rule because EPA "failed to provide a rational explanation for its decision" declining to exclude oilbearing waste waters from the statutory definition of solid waste).

EPA maintains that construction sites regulated under the Phase II Rule degrade water quality across the United States and that the administrative record unambiguously documents that harm. EPA disputes Petitioners' assertion that it failed to establish the need to regulate small sites nationwide, but also contends that it is not required to base every administrative decision on a precise quantitative analysis. See *Sierra Club*, 167 F.3d at 662 ("EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem.").

EPA also disputes petitioners' assertions that data from studies involving larger construction sites are irrelevant to the Phase II Rule. EPA explains that discharges of sediment due to erosion are the result of the interaction of several factors including soils, slope, precipitation, and vegetation:

For construction sites that are one acre or more, none of the environmental factors contributing to sediment discharges is dependent on the size of the site disturbed. A one-acre site can have the same combination of soils, slope, degree of disturbance and precipitation as a 100-acre site, and consequently can lose soil at the same rate ... and discharge sediments in the same concentrations ... as a 100-acre site.

EPA contends that it is thus reasonable to extrapolate data about small sites from studies of larger ones—and that such an extrapolation may even be forgiving, since small sites are currently less likely to have effective erosion and sedimentation control plans.⁵²

*871 Indeed, EPA argues that although adverse water quality impacts of small construction sites have been widely recognized, effective local erosion and sedimentation control programs have not been adopted in many areas.⁵³ Though not all watersheds are currently adversely effected by small construction sites,⁵⁴ EPA notes that the Phase II Rule acts "to protect water quality" both remedially and preventively, and argues that it need not quantify the cumulative effects

of discharges from these sites or identify all watersheds that are currently harmed before acting to limit pollution from small sites.⁵⁵

[25] We reverse under the arbitrary and capricious standard only if the agency has relied on factors Congress did not intend it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision contrary to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise. *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43, 103 S.Ct. 2856. Petitioners' contention that EPA relied on factors Congress did not intend it to consider was rejected in our earlier discussion of the regulatory basis challenge. They submit no evidence that EPA failed to consider an important aspect of the problem. We cannot say that EPA's designation of small construction sites is implausible (especially given the support of twenty-some-odd studies of sedimentation from construction sites that EPA reviewed in promulgating the challenged regulations, 64 Fed. Reg. 68,728–31). We could remand this aspect of the Rule only if, as the petitioners urge, EPA's explanation for its decision to regulate small construction sites were contrary to the record evidence, and it is not.

Petitioners' primary contention is that evidence in the record suggests it is not possible to provide an explicit, quantitative link between small construction sites and an adverse effect on water quality. But even if this were so, EPA's decision to regulate preventively small construction sites “to protect water quality” is not inconsistent with the record. Petitioners contend that EPA's reliance on data from studies of large construction sites is insufficient to support EPA's designation of small sites, but EPA has adequately supported its contention that experts can reasonably *872 extrapolate projected water quality impacts from large to small sites. We apply the substantial evidence standard when reviewing the factual findings of an agency, *Dickinson v. Zurko*, 527 U.S. 150, 156–58, 119 S.Ct. 1816, 144 L.Ed.2d 143 (1999),⁵⁶ and find it satisfied here.

Moreover, EPA is not required to conduct the “perfect study.” *Sierra Club*, 167 F.3d at 662. We defer to an agency decision not to invest the resources necessary to conduct the perfect study, and we defer to a decision to use available data unless there is no rational relationship between the means EPA uses to account for any imperfections in its data and the situation to which those means are applied. *Id.*; *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1004 (D.C.Cir.1997). The record indicates a reasoned basis for EPA's decision that regulating small construction sites was necessary “to protect water quality” as required by § 402(p)(6).

[26] *b. Waivers.* Industry Petitioners further contend that EPA's allowance of regulatory waivers for small construction sites not likely to cause adverse water quality impacts inappropriately supplements the permitting regulations.

Petitioners argue that EPA has the burden of establishing a comprehensive program to control sources as necessary to protect water quality, and that shifting the burden to individual contractors, businesses, and homeowners to prove they do not harm water quality falls short of meeting this statutory obligation. Citing *National Mining Association v. Babbitt*, 172 F.3d 906, 910 (D.C.Cir.1999), they argue that EPA's rebuttable regulatory presumption of water quality impact from small construction activity is unreasonable because the agency has established no scientific likelihood that any given small site will affect water quality. EPA defends the waiver approach as fair and efficient, and argues that the Industrial Petitioners are confusing arguments about the limits of presumptions in evidentiary hearings conducted under the APA.⁵⁷

EPA is correct; the Phase II Rule creates no presumption applicable to an evidentiary hearing, and a regulation creating exemptions by waiver is reviewed under the familiar arbitrary and capricious standard. The use of waivers to allow permit exemptions for small sites unlikely to cause adverse impacts is reasonable under that standard.

[27] *c. Consistency.* Industry Petitioners also argue that EPA's decision to regulate all small construction sites under the Phase II Rule is arbitrary and capricious because EPA applied a different standard in regulating small construction projects than it applied to other potential sources of stormwater runoff subject to Phase II regulation.

Petitioners contend that EPA decided not to designate other potential sources identified in the § 402(p)(5) studies because it determined that there are not “sufficient data ... available at this time on which to make a determination of potential adverse water quality impacts for the category of sources.” 64 Fed. Reg. at 68,780. Petitioners contend this standard should have been applied to small construction sites as well, but EPA opted to *873 regulate these sources despite an alleged lack of coherent data on small site impacts as a general category.

EPA counters, once again, that it did have adequate data to regulate small construction sites. It contends that construction sites of all sizes have greater erosion rates than almost any other land use, and thus are not similarly situated to the potential polluters that EPA chose not to regulate at this time.⁵⁸ These sources include secondary industrial activities (for example, maintenance of construction equipment or local trucking for an unregulated facility such as a grocery store) and other unregulated commercial activities (for example, car and truck rental facilities). 64 Fed. Reg. at 68,779. EPA reports that it decided not to categorically regulate these potential sources based both on available data about water quality impacts and on the extent to which potentially adverse water quality impacts are mitigated by existing regulations to which these sources are already subject. *Id.* at 68,780.

We find no error. See *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851. EPA acted reasonably in designating all small construction sites for Phase II regulation, and Industry Petitioners point to no record evidence that the nature of pollutant contributions from small construction site discharge is sufficiently similar to pollutants from the non-regulated sources to support the analogy they seek to draw. *New Orleans Channel 20 v. FCC*, 830 F.2d 361, 366 (D.C.Cir.1987) (an agency does not act irrationally when it treats parties differently, unless the parties are similarly situated). Sufficient evidence supports EPA's conclusion that small construction sites are not similar enough to these “other sources” to support petitioner's challenge.

G. Continuing (“Residual”) Designation Authority

The Industry Petitioners argue that EPA acted improperly in retaining authority to designate future sources of stormwater pollution for Phase II regulation as needed to protect federal waters. We disagree.

The Phase II Rule preserves authority for EPA and authorized States to designate currently unregulated stormwater dischargers as requiring permits under the Rule if future circumstances indicate that they warrant regulation “to protect water quality” under the terms of § 402(p)(6). 40 C.F.R. § 122.26(a)(9). In the Phase II Preamble, EPA explains this aspect of the Rule:

Under today's rule, EPA and authorized States continue to exercise the authority to designate remaining unregulated discharges composed entirely of stormwater for regulation on a case-by-case basis.... Individual sources are subject to regulation if EPA or the State, as the case may be, determines that the stormwater discharge from the source contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. This standard is based on the text of section CWA 402(p). In today's rule, EPA believes, as Congress did in drafting section CWA 402(p)(2)(E), that individual instances of stormwater discharge might warrant special regulatory attention, but do not fall neatly into a discrete, predetermined category. Today's rule preserves the regulatory authority *874 to subsequently address a source (or category of sources) of stormwater discharges of concern on a localized or regional basis.

64 Fed. Reg. 68,781. The text of the Rule requires a discharger to obtain a permit if the NPDES permit authority determines that “stormwater controls are needed for the discharge based on wasteload allocations that are part of ‘total

maximum daily loads' (TMDLs⁵⁹) that address the pollutant(s) of concern” or that “the discharge, or category of discharges within a geographic area, contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.” 40 C.F.R. §§ 122.26(a)(9)(i)(C)-(D).

1. Statutory Authority

The Industry Petitioners contend that this “residual” designation authority, which would allow a NPDES permitting authority to require at any future time a permit from any stormwater discharge not already regulated, is *ultra vires*. Although they concede that Congress authorized case-by-case designation in § 402(p)(2)(E),⁶⁰ they argue that this authority attached only during the permitting moratorium that ended in 1994, prior to the Phase II rulemaking. They object that EPA has impermissibly designated a category of “not yet identified” sources and preserved authority to regulate them on a case-by-case basis indefinitely into the future.⁶¹

[28] Petitioners contend that § 402(p)(6)⁶² cannot rescue the residual authority because it does not authorize case-by-case identification of discharges to be regulated, and that Congress, had it intended otherwise, would have included language in § 402(p)(6) similar to the case-by-case authority explicitly granted in § 402(p)(2)(E).⁶³ They also contend that *875 continuing authority to designate sources based on waste load allocations that are part of TMDLs exceeds the scope of authority in § 402(p)(2), which nowhere mentions TMDLs. Finally, they argue that the categorical designation authorized by § 402(p)(6) is only permissible when based on the § 402(p)(5) studies and carried out in consultation with state and local authorities, but that the Rule allows future designations based on agency discretion unaccompanied by adequate demonstration that the source itself is a significant threat to water quality.

EPA counters that § 402(p)(6) authorized the designation, made on the basis of statutorily required sources of input and in consultation with the States, of a third class of discharges to be identified on location-specific bases by the NPDES permitting authority. EPA contends that Petitioners mistake the source of its authority for continuing designations as arising only from § 402(p)(2), discounting the full scope of its authority under § 402(p)(6). EPA argues that it permissibly interpreted § 402(p)(6) as allowing the residual designation authority because its language does not expressly preclude it, and because such authority is consistent with (and arguably required by) that section's mandate to establish a “comprehensive program” to protect water quality from adverse stormwater discharges. EPA maintains that the structure of § 402(p) reflects “Congress' intent to assure regulation of all problematic stormwater discharges as expeditiously as reasonably possible—not to limit EPA to a one-time-only opportunity to designate discharges for regulation.”

[29] We review EPA's interpretation of the statute it administers with deference, *Royal Foods Co.*, 252 F.3d at 1106, and affirm this aspect of the Phase II Rule as a legitimate exercise of regulatory authority conferred by § 402(p). The residual designation authority is grounded both on § 402(p)(6), which broadly authorizes a comprehensive program to protect water quality, and on § 402(p)(2)(5), which authorizes case-by-case designation of certain polluters and categories of polluters.

While not a blank check, § 402(p)(6) authorizes a comprehensive program that allows regional designation of polluting discharges that compromise water quality locally, even if they have not been established as compromising water quality nationally at the time Phase II was promulgated. In allowing continuing designation authority, EPA permissibly designated a third category of dischargers subject to Phase II regulation—those established locally as polluting U.S. waters—following all required studies and consultation with state and local officials. EPA reasonably determined that discharges other than those from small MS4s and construction sites were likely to require regulation “to protect water quality” in satisfaction of the § 402(p)(6) mandate. EPA reasonably determined that, although it lacked sufficient data to support nationwide, categorical *876 designation of these sources, particularized data might support their designations

on a more localized basis. EPA reasonably interpreted § 402(p)(6) as authorizing regional designation of sources and regional source categories, based on water quality standards including TMDLs.

Petitioners' § 402(p)(2)(5) argument (that EPA could not draw support for the residual designation authority from § 402(p)(2)(5) because such authority expired in 1994) is contradicted by the plain language of the statute. Respondent-intervenor NRDC correctly notes that § 402(p)(1) sets forth a permitting moratorium for stormwater discharges prior to 1994, and that § 402(p)(2) exempts certain categories of sources from that permitting moratorium, including those to be regulated on a case-by-case basis under § 402(p)(2)(5). Specifically, the statute provides that the 1994 date “shall not apply” to the five categories of discharges listed in § 402(p)(2). The termination of a moratorium that “shall not apply” to the continuing designation authority under § 402(p)(2)(5) cannot rescind EPA's authority to regulate sources in that category. Nothing in § 402(p) suggests that authority to designate these sources ends at any time, and EPA remains free to designate § 402(p)(2)(E) dischargers.

Finally, although Petitioners may be legitimately concerned that a permitting authority may designate a source without adequately establishing its eligibility, this issue must be addressed in the context of an actual case or controversy. Whether a NPDES authority may impose permitting requirements on a discharger without an adequate finding of polluting activity is not yet ripe for judicial review. *Thomas v. Anchorage Equal Rights Comm'n*, 220 F.3d 1134, 1141 (9th Cir.2000) (“A concrete factual situation is necessary to delineate the boundaries of what conduct the government may or may not regulate.”).

2. Nondelegation Doctrine

[30] Industry Petitioners contend that EPA's interpretation of § 402(p) to allow the residual designation authority must be rejected because it would render the statute unconstitutional under the nondelegation doctrine. We deny petitioners' claim, both because it is not properly raised and because it rests on an interpretation explicitly overturned by the United States Supreme Court.

Petitioners base their contention on *American Trucking Ass'ns v. EPA*, 175 F.3d 1027, 1034 (D.C.Cir.1999),⁶⁴ in which the D.C. Circuit remanded a regulation under the nondelegation doctrine because, although EPA had applied reasonable factors in establishing the air quality standards in question, the agency had articulated no “intelligible principle” to channel its application of these factors. *Id.* Petitioners argue that if § 402(p) authorizes a NPDES permitting authority to require Phase II permitting of any stormwater source deemed to be a “significant contributor” of pollutants to U.S. waters, then that grant of authority likewise constitutes an unconstitutional delegation of legislative authority because—as did the *American Trucking* delegation—it “leaves [EPA] free to pick any point” at which a regulatory burden will attach. *Id.* at 1037.

However, in reversing *American Trucking*, the Supreme Court rejected the notion that an agency has the power to interpret a statute so as to either save it from being, or transform it into, an unconstitutional delegation. *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 473, 121 S.Ct. 903, 149 L.Ed.2d 1 (2001). Whether a statute delegates legislative power “is a question for the courts, and an agency's [interpretation] has no bearing upon the answer.” *Id.* Petitioner's argument to the contrary rests on the very reasoning in *American Trucking* that was overturned in *Whitman*. The relevant question is not whether EPA's interpretation is unconstitutional, but whether the statute itself is unconstitutional—a challenge Industry Petitioners do not raise.

But even if the challenge were properly raised, § 402(p) would, like the Clean Air Act standard-setting provision at issue in *Whitman*, survive constitutional review. The Supreme Court has upheld against nondelegation attacks many similar statutes establishing nonquantitative standards. *Am. Power & Light Co. v. SEC*, 329 U.S. 90, 104, 67 S.Ct. 133, 91 L.Ed. 103 (1946) (upholding statute giving SEC authority to modify corporate structures so that they are not “unduly or unnecessarily complicate[d]” and do not “unfairly or inequitably distribute voting power among security holders”);

Yakus v. United States, 321 U.S. 414, 419–20, 423–27, 64 S.Ct. 660, 88 L.Ed. 834 (1944) (upholding statute giving agency power to set prices that “will be generally fair and equitable”). In *Yakus*, the Court held that a statutory command to “effectuate the purposes” of the overall statutory scheme withstood scrutiny. *Id.* Section 402(p)(6)'s directive “to protect water quality” summarizes the central purpose of the Clean Water Act, “to restore and maintain the chemical, physical, and biological integrity of the Nation's waters,” 33 U.S.C. § 1251(a). It establishes a determinate criterion of the kind the Supreme Court upheld in *Yakus* and *American Power & Light*.

3. Notice and Comment

[31] Industry Petitioners also contend that, to the extent it allows the designation of entire categories of sources, rather than individual sources, the residual designation authority violates the APA, 5 U.S.C. § 553(b)(3), because EPA did not provide public notice that it was considering such a rule. *Ober v. EPA*, 84 F.3d 304, 315 (9th Cir.1996) (invalidating EPA rule where it deviated from proposal); *Shell Oil Co. v. EPA*, 950 F.2d 741, 746–47 (D.C.Cir.1991). Petitioners contend that while the proposed rule would have allowed case-by-case designation where an authority “determines that the discharge contributes to a violation,” 63 Fed. Reg. at 1635 (proposing 40 C.F.R. § 122.26(a)(9)(i)(D)), the final rule authorizes case-by-case designation where “the discharge, or category of discharges within a geographic area, contributes to a violation,” 40 C.F.R. § 122.26(a)(9)(i)(D).

EPA notes that it had proposed to promulgate continuing designation authority in some form, and points to elements in the proposed rule that explicitly envision the categorical designation of sources at the local/watershed level.⁶⁵

*878 According to the “logical outgrowth” standard, a final regulation must be “in character with the original proposal and a logical outgrowth of the notice and comments.” *Hodge*, 107 F.3d at 712. EPA emphasized that it was considering continuing designations based on watershed data rather than designating these sources on a national basis, and invited comment regarding this proposal. 63 Fed. Reg. at 1536. This supports the necessary relationship between the proposed and final rule.

H. Regulatory Flexibility Act

The Industry Petitioners contend that the Phase II Rule will impose substantial compliance costs on their members and other small entities, but that EPA failed to conduct the analysis required by the Regulatory Flexibility Act (“RFA”), 5 U.S.C. §§ 601–11. They argue that EPA seeks to excuse its noncompliance by falsely certifying that the Rule does not have a significant impact on a substantial number of small entities. 64 Fed. Reg. at 68,800. We are not persuaded.

[32] The RFA requires a federal agency to prepare a regulatory flexibility analysis and an assessment of the economic impact of a proposed rule on small business entities, 5 U.S.C. § 604, unless the agency certifies that the proposed rule will not have a “significant economic impact on a substantial number of small entities” and provides a factual basis for that certification, *id.* at § 605; *N.W. Mining Ass'n v. Babbitt*, 5 F.Supp.2d 9, 15–16 (D.D.C.1998).

EPA did certify that the Phase II Rule would not yield “significant impacts,” 64 Fed. Reg. at 68,800, but Petitioners contend this certification is erroneous because (1) EPA treats as “not significant” costs that are in fact significant, and (2) EPA failed to account for the entire universe of small entities affected (including small home construction contractors) and all significant costs to those entities. They urge that the failure to consider a significant segment of the affected small entity community requires invalidation of the Rule, citing *North Carolina Fisheries Ass'n v. Daley*, 27 F.Supp.2d 650, 659 (E.D.Va.1998) (certification failed to comply with RFA where agency ignored several categories of affected small entities), and *Northwest Mining*, 5 F.Supp.2d at 15 (RFA was violated where improper definition of small entity excluded analysis of affected entities).

EPA maintains that its certification was appropriate, and, moreover, that it has already voluntarily followed the additional RFA procedures that the Industry Petitioners now request. EPA argues that Petitioners have incorrectly

specified the costs that the small entities they represent will bear, referring erroneously to EPA's total annual compliance costs estimates for all entities, rather than to costs estimated for small entities as defined under the RFA. EPA maintains that it did consider economic impacts on small home construction contractors who might be denied discharge permits, and that it evaluated the annual costs of Phase II compliance associated with any land disturbance between one and five acres. 64 Fed. Reg. at 68,800–01.

Respondent-intervenor NRDC contends that Petitioners' reliance on measures of the aggregate impact of the Rule on small entities to determine compliance with the threshold test under the RFA fails as a matter of law because aggregate measures are not consistent with the statutory language setting out that test. NRDC notes that the plain language of § 605(b) sets out a three-component test indicating that EPA need not perform a regulatory flexibility analysis if it finds that the proposed *879 rule will not have: (1) “a significant economic impact” on (2) “a substantial number” of (3) “small entities.” 5 U.S.C. § 605(b). NRDC contends that EPA satisfied the statutory test, and that Petitioners' interpretation, which rewrites the test to omit the “substantial number” component, is erroneous.

[33] We believe NRDC correctly interprets the statute, *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851, and that EPA reasonably certified that the Phase II Rule would not have a significant economic impact in compliance with the Regulatory Flexibility Act. We also conclude that, even if EPA had failed to properly comply with the procedural requirements of the RFA, its actual assessment of the Rule's economic impacts renders any defective compliance harmless error. In granting relief under RFA § 611, a court may order an agency “to take corrective action consistent with” the RFA and APA, including remand to the agency, 5 U.S.C. § 611(a)(4)(A), but EPA has already conducted the economic analyses Petitioners seek when it convened the “Small Business Advocacy Review Panel” before publishing notice of the proposed rule. 64 Fed. Reg. at 68,801. That Panel evaluated the Rule and considered the comments of small entities on a number of issues, consistent with the procedures described in RFA § 603. *Id.* Appendix 5 of EPA's preamble to the proposed rule explained provisions that had been designed to minimize impacts on small entities, based on advice and recommendations from the Panel. 63 Fed. Reg. 1615, 64 Fed. Reg. 68,811. Modifications for small entities included alternative compliance and reporting mechanisms responsive to the resources of small entities, simplified procedures, performance rather than design standards, and waivers.

Any hypothetical noncompliance would thus have been harmless, since the available remedy would simply require performance of the economic assessments that EPA actually made. Like the Notice and Comment process required in administrative rulemaking by the APA, the analyses required by RFA are essentially procedural hurdles; after considering the relevant impacts and alternatives, an administrative agency remains free to regulate as it sees fit. We affirm the Rule against this challenge.⁶⁶

III.

CONCLUSION

We conclude that the EPA's failure to require review of NOIs, which are the functional equivalents of permits under the Phase II General Permit option, and its failure to make NOIs available to the public or subject to public hearings contravene the express requirements of the Clean Water Act. We therefore remand these aspects of the Small MS4 General Permit option so that EPA may take appropriate action to comply with the Clean Water Act. We also remand so that EPA may consider in an appropriate proceeding the Environmental Petitioners' contention that § 402(p)(6) requires EPA to regulate forest roads. We affirm all other aspects of the Phase II Rule against the statutory, administrative, and constitutional challenges raised in this action.

*880 Petitions for Review GRANTED IN PART and DENIED IN PART.

TALLMAN, Circuit Judge, concurring in part and dissenting in part:

I concur in most of the majority's opinion, but I dissent from Section II.B, which remands the Phase II Rule because its system of general permits is "arbitrary and capricious." I believe EPA's design of a system of general permits supported by notices of intent was a reasonable exercise of EPA's administrative discretion. We must give deference to EPA's interpretation of the laws it is charged with enforcing, so long as EPA's reading of those laws is permissible. Because EPA acted reasonably in designing a National Pollutant Discharge Elimination System ("NPDES") based on general permits and supported by NOIs, I respectfully dissent from the court's decision to remand this portion of the Phase II Rule.

I

As the majority concedes, we evaluate EPA's interpretation of the Clean Water Act with deference. Majority Op. 13796. If Congress's intent is unclear as to whether a system of general permits supplemented by NOIs is allowed, we simply ask "whether EPA's interpretation is permissible." *Ober v. Whitman*, 243 F.3d 1190, 1193 (9th Cir.2001).

II

As an initial matter, then, we must ask if Congress was clear in its intent concerning the propriety of a system of general permits augmented by NOIs.

Five legislative commands guide this inquiry. First, [33 U.S.C. § 1342\(p\)\(6\)](#) charges EPA with creating a system to regulate stormwater discharges. Plainly, nothing in this section speaks to whether EPA may utilize a general permit approach in regulating stormwater discharge.

Second, [33 U.S.C. § 1311\(a\)](#) makes it illegal to discharge pollutants "except as in compliance" with several sections of the Clean Water Act. Again, nothing in this section addresses whether EPA may make use of general permits reinforced by NOIs.

Third, [33 U.S.C. § 1342](#) in general (as opposed to the limited charge in [section 1342\(p\)\(6\)](#) discussed above) authorizes EPA to issue NPDES permits, provided that the permits satisfy several conditions. But nothing in [section 1342](#) prohibits the use of a system of general permits.

Fourth, the Clean Water Act mandates that "a copy of each permit application and each permit issued under" the NPDES permitting program be made available to the public for inspection and photocopying. [33 U.S.C. § 1342\(j\)](#). The Act does not elaborate on this naked requirement. There is no explanation of the manner in which NPDES permits and applications are to be made publicly available. Nor does the Act define what constitutes a "permit" that would trigger these requirements.

And fifth, the Clean Water Act authorizes the issuance of an NPDES "permit" "after opportunity for public hearing." [33 U.S.C. § 1342\(a\)\(1\)](#). The Act does not provide a definition of "permit," nor does it further detail what triggers the requirement of a public hearing.

In short, the Clean Water Act fails to address the propriety of a general permit system, or whether NOIs ought to be considered "permits." Therefore, we should uphold EPA's creation of a system of general permits buttressed by NOIs so long as it is "permissible." See *881 *Chevron, U.S.A., Inc. v. Natural Resources Defense Council*, 467 U.S. 837, 843–

44, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984). Our duty to defer to EPA in such a situation is based on sound policy. Given the overwhelming challenge and complexity of the programs administered by federal agencies today, it is sensible to trust agencies with the design of those programs so long as the programs are reasonable interpretations of congressional mandates.

The central issues regarding EPA's general permit system are whether the Clean Water Act allows such a system and whether NOIs should be considered "permits." The resolution of these issues requires a complicated weighing of policies (e.g., administrative streamlining vs. robust inquiry) that is precisely what agencies are designed to do and courts are without the resources or expertise to do. "[I]f the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction." *Chevron*, 467 U.S. at 843, 104 S.Ct. 2778.

III

The Phase II Rule promulgates a system of general permits. EPA contemplated that these general permits will be issued on a watershed basis, with individual stormwater dischargers then filing NOIs to operate under general permits. The federal regulations implementing this system repeatedly emphasize that "[t]he use of general permits, instead of individual permits, reduces the administrative burden of permitting authorities, while also limiting the paperwork burden on regulated parties." 64 Fed. Reg. 68,722, 68,737, 68,762 (Dec. 8, 1999).

The use of a general permit system for the administration of the NPDES system has been considered and approved before. In *NRDC v. Costle*, 568 F.2d 1369 (D.C.Cir.1977), the District of Columbia Circuit considered a challenge to EPA's regulations under the Federal Water Pollution Control Act, which was the precursor to the Clean Water Act. In *Costle*, EPA sought approval of its design for the NPDES system. EPA had issued regulations exempting broad categories of point sources from the requirement that an NPDES permit be obtained before discharging into federal waters. Part of EPA's rationale in creating the exempted categories was that otherwise EPA would be overwhelmed by the administrative burden of issuing NPDES permits. *Id.* at 1377–79. The *Costle* court affirmed the lower court's rejection of these exemptions because the legislation in question plainly required that all point sources obtain some kind of NPDES permit. *Id.* But in rejecting EPA's regulations, the *Costle* court discussed the options available to EPA in promulgating an NPDES system that was considerate of the enormous burden such a system could impose on EPA. *Id.* at 1380–81. In particular, the court recommended "the use of area or general permits. *The Act allows such techniques.* Area-wide regulation is one well-established means of coping with administrative exigency." *Id.* at 1381 (emphasis added).

Against this backdrop, EPA's creation of a general permit system was entirely permissible. And if the creation of a general permit system is permissible, then it does not matter whether NOIs are given a public airing.

The majority contends that the general permit system prevents EPA from fulfilling its duty to make sure that municipalities do not discharge pollutants in violation of the Clean Water Act. The majority reasons that by failing to require EPA review of NOIs, the Rule fails to ensure that a regulated MS4's stormwater pollution control program will satisfy the Clean Water Act requirement that the MS4 "reduce *882 discharges to the maximum extent practicable." Majority Op. 855. But the majority's analysis ignores the effects of the general permit. By filing an NOI, a discharger obligates itself to comply with the limitations and controls imposed by the general permit under which it intends to operate. EPA mandates that all permits (including general permits) condition their issuance on satisfaction of pollution limitations imposed by the Clean Water Act. 40 C.F.R. § 122.44. In particular, EPA requires permits to satisfy the restrictions imposed by Clean Water Act section 307(a). *Id.* at § 122.44(b)(1). Therefore, the *general permit* imposes the obligations with which the discharger must comply (including applicable Clean Water Act standards), and EPA's decision not to review every NOI is not a failure to insure compliance with the Clean Water Act.

The majority also objects to EPA's general permit system because it fails to allow for sufficient public participation in the NOIs. Majority Op. 856–858. The majority's position fails to give deference to EPA and imposes the majority's own wishes instead. EPA would have been justified in creating a system entirely reliant on general or area permits. Its imposition of NOIs is an indulgence to certain policy prerogatives, namely public involvement and the collection of additional information. But the power to create a general permit system necessarily implies the power to require subordinate steps for NOIs that do not quite reach the level of inquiry associated with actual permits.

IV

We function as an adjudicator of disputes, not as a policy-making body. Where an agency promulgates rules after a deliberative process, it is incumbent upon us to respect the agency's decisions or else risk trivializing the function of that agency. In this case, EPA made a permissible decision to create a general permit program supported by NOIs. Therefore, I respectfully dissent from Section II.B of the majority's opinion.

All Citations

344 F.3d 832, 57 ERC 1039, 33 Env'tl. L. Rep. 20,269, 03 Cal. Daily Op. Serv. 8398, 2003 Daily Journal D.A.R. 10,479

Footnotes

- 1 The “Phase II Rule” reviewed here is the product of the second stage of EPA's two-phase stormwater rulemaking effort. The “Phase I Rule,” governing larger-scale stormwater discharges, was issued in 1990 and reviewed by this court in *Natural Res. Def. Council v. EPA*, 966 F.2d 1292 (9th Cir.1992).
- 2 Richard G. Cohn–Lee and Diane M. Cameron, *Urban Stormwater Runoff Contamination of the Chesapeake Bay: Sources and Mitigation*, THE ENVIRONMENTAL PROFESSIONAL, Vol. 14, p. 10, at 10 (1992); see also *Natural Res. Def. Council*, 966 F.2d at 1295 (citing a study by the Nationwide Urban Runoff Program).
- 3 [Regulation for Revision of the Water Pollution Control Program Addressing Storm Water](#), 64 Fed. Reg. 68,722, 68,724, 68,727 (Dec. 8, 1999) (codified at 40 C.F.R. pts. 9, 122, 123, and 124).
- 4 *Id.* at 68,726.
- 5 *Id.*
- 6 *Id.* at 68,725–31.
- 7 A point source is “any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.” 33 U.S.C. § 1362(14).
- 8 Diffuse runoff, such as rainwater that is not channeled through a point source, is considered nonpoint source pollution and is not subject to federal regulation. *Oregon Natural Desert Ass'n v. Dombek*, 172 F.3d 1092, 1095 (9th Cir.1998).
- 9 [National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges](#), 55 Fed. Reg. 47,990 (Nov. 16, 1990) (codified at 40 C.F.R. pt. 122–124). The Phase I rule was challenged in this court in *Natural Res. Def. Council*, 966 F.2d at 1292. We held, *inter alia*, that EPA must impose deadlines for permit approvals, *id.* at 1300, that EPA's decision to regulate construction sites only over five acres in size was arbitrary and capricious, *id.* at 1306, and that EPA did not act capriciously in defining “municipal,” *id.* at 1304, or in placing differently-sized municipalities on different permitting schedules, *id.* at 1301.
- 10 [Proposed Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges](#), 63 Fed. Reg. 1536 (proposed Jan. 9, 1998).
- 11 Pub. L. No. 106–74, § 431(a), 113 Stat. 1047, 1096 (1999) (“Appropriations, 2000—Department of Veterans Affairs and Housing and Urban Development, and Independent Agencies”).
- 12 [Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges](#), 64 Fed. Reg. 68,722 (Dec. 8, 1999) (codified at 40 C.F.R. pts. 9, 122, 123, and 124).
- 13 The Rule also allows a small MS4 to be regulated under an individual NPDES permit covering a nearby large or medium MS4, with provisions adapted to address the small MS4. 40 C.F.R. § 122.33(b)(3).

14 The text of that section reads: “Not later than October 1, 1993, [EPA], in consultation with state and local officials, shall issue regulations (based on the results of the studies conducted under paragraph (5)) which designate stormwater discharges, other than those discharges described in paragraph (2), to be regulated to protect water quality and shall establish a comprehensive program to regulate such designated sources. The program shall, at a minimum, (A) establish priorities, (B) establish requirements for State stormwater management programs, and (C) establish expeditious deadlines. The program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate.” 33 U.S.C. § 1342(p)(6).

15 The lesser category of “permits” may also be implied by the inclusion of “performance standards” in the list of possible program features.

16 “Where Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.” *Bates v. United States*, 522 U.S. 23, 29–30, 118 S.Ct. 285, 139 L.Ed.2d 215 (1997).

17 The Phase II Rule also allows a small MS4 to be regulated under an NPDES permit covering a nearby large or medium-sized MS4, with provisions adapted to address the small MS4. 40 C.F.R. § 122.33(b)(3).

18 The Municipal Petitioners argue that the Minimum Measures exceed EPA’s statutory authority under § 402(p) of the Clean Water Act. We disagree. The list of elements for a regulatory program that appears in § 402(p)(6) is nonexclusive, and EPA’s adoption of the Minimum Measures represents a permissible interpretation of its authority under § 402(p)(6). See *Chevron*, 467 U.S. at 843–44, 104 S.Ct. 2778.

The Municipal Petitioners argue that EPA is not entitled to *Chevron* deference, and that the Minimum Measures must be rejected absent a clear statement of congressional intent that EPA enact the Minimum Measures. The Municipal Petitioners argue that this clear statement requirement arises because there are “significant constitutional questions” about the permissibility of the Minimum Measures under the Tenth Amendment, and because the Minimum Measures alter “the federal-state framework by permitting federal encroachment upon a traditional state power.” *Solid Waste Agency of N. Cook County v. Army Corps of Eng’rs*, 531 U.S. 159, 173, 121 S.Ct. 675, 148 L.Ed.2d 576 (2001).

As we explain, because the Phase II Rule includes at least one alternative to the Minimum Measures, *i.e.*, the option of seeking a permit under 40 C.F.R. § 122.26(d), the Minimum Measures do not present significant Tenth Amendment problems demanding a clear statement of congressional intent. Nor does the Phase II Rule alter the federal-state balance. To the contrary, the option of seeking a permit under 40 C.F.R. § 122.26(d) maintains precisely the same federal-state balance as existed prior to the Phase II Rule. See, *e.g.*, *Natural Res. Def. Council v. EPA*, 966 F.2d 1292 (9th Cir.1992) (reviewing Phase I Rule); *Natural Res. Def. Council v. Costle*, 568 F.2d 1369, 1379 (D.C.Cir.1977) (denying EPA authority to exempt MS4s from regulation under the Clean Water Act). Furthermore, even if a clear statement of congressional intent were necessary, § 402(p) of the Clean Water Act is replete with clear statements that Congress intended EPA to require MS4s either to obtain NPDES permits or to stop discharging stormwater.

19 This subsection provides that permit seekers must, “[t]o the extent allowable under State, Tribal, or local law, effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into your storm sewer systems and implement appropriate enforcement procedures and actions....” 40 C.F.R. § 122.34(b)(3)(ii)(B).

20 This subsection provides that permit seekers “must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre.... [The] program must include the development and implementation of, at a minimum: (A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law; (B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices; (C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality; (D) Procedures for site plan review which incorporate consideration of potential water quality impacts; (E) Procedures for receipt and consideration of information submitted by the public, and (F) Procedures for site inspection and enforcement control measures.” 40 C.F.R. §§ 122.34(b)(4)(i)-(ii).

21 This subsection provides that permit seekers must “[u]se an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects [disturbing one acre or more] to the extent allowable under State, Tribal or local law.” 40 C.F.R. §§ 122.34(b)(5)(ii)(B).

22 EPA and NRDC also argue that the Minimum Measures are facially constitutional, and that the Phase II Rule presents no Tenth Amendment difficulties because operators of small MS4s may avoid stormwater regulation entirely by electing not to discharge stormwater into federal waters in the first place. In light of our holding with regard to the Alternative Permit option, we do not consider these arguments.

- 23 We decline to address two further arguments raised by EPA: first, that municipalities do not receive full First Amendment protections, under *Muir v. Alabama Educational Television Commission*, 688 F.2d 1033, 1038 n. 12 (5th Cir.1982) (*en banc*) (“Government expression, being unprotected by the First Amendment, may be subject to legislative limitation which would be impermissible if sought to be applied to private expression”), and *Aldrich v. Knab*, 858 F.Supp. 1480, 1491 (W.D.Wash.1994) (holding that “unlike private broadcasters, the state itself does not enjoy First Amendment rights”), and second, that even if the First Amendment were fully applicable, the Phase II regulations would satisfy them because MS4s may avoid the compulsion to speak by seeking a permit under the Alternative option, 40 C.F.R. § 122.26(d)(2)(iv), rather than under the Minimum Measures.
- 24 As a subsidiary matter, we note that it also falls short of compelling the MS4 to “regulate” third parties in contravention of the Tenth Amendment. Dispensing information to facilitate public awareness about safe disposal of toxic materials constitutes “encouragement,” not regulation.
- 25 “When the constitutional validity of a statute or regulation is called into question, it is a cardinal rule that courts must first determine whether a construction is possible by which the constitutional problem may be avoided.” *Meinhold*, 34 F.3d at 1476.
- 26 In its most recent treatment of compelled speech, the Supreme Court held that a generic advertising campaign violated free speech where the message was specific and antagonistic to the preferred advertising message of the plaintiff, and the regulation compelling participation was not part of a broader regulatory apparatus already constraining the plaintiff’s autonomy in the relevant arena. *United States Dep’t. of Agriculture v. United Foods*, 533 U.S. 405, 410–17, 121 S.Ct. 2334, 150 L.Ed.2d 438 (2001). The court distinguished this advertising program from the one in *Glickman* on the latter point: “[t]he program sustained in *Glickman* differs from the one under review in a most fundamental respect. In *Glickman* the mandated assessments for speech were ancillary to a more comprehensive program restricting market autonomy.” *Id.* at 411, 121 S.Ct. 2334. Although the Phase II Rule is not an advertising or marketing regulation, it constitutes a “comprehensive program” restricting the autonomy of MS4s in the relevant arena of controlling toxic discharges to storm sewers that drain to U.S. waters.
- 27 In deciding the similar question of whether a regulation impermissibly compelled speech by requiring manufacturers of mercury-containing products to inform consumers how to dispose safely of the toxic material, the Second Circuit held that “mandated disclosure of accurate, factual, commercial information does not offend the core First Amendment values of promoting efficient exchange of information or protecting individual liberty interests.” *Nat’l Elec. Mfrs. Ass’n v. Sorrell*, 272 F.3d 104, 114 (2d Cir.2001). What speech may follow from the Phase II directive will not be “commercial” in the same sense that manufacturer labeling is, but it will be similar in substance to *Sorrell* to the extent that it informs the public how to dispose safely of toxins. We think the policy considerations underlying the commercial speech treatment of labeling requirements, *see, e.g.*, the Federal Cigarette Labeling and Advertising Act, 15 U.S.C. §§ 1333–39, apply similarly in the context of the market-participant municipal storm sewer provider.
- 28 The Alternative option contains a public education requirement that is similar but even less specific, and therefore even less burdensome, than the requirements in the Minimum Measures. *See* § 122.26(d)(2)(iv)(B)(6) (requiring permit seekers to propose programs to counter illicit discharges, including a “description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials”).
- 29 Municipal Petitioners concede that “simplified individual permit application requirements” were discussed, but they contend that the permit requirements discussed are not sufficiently similar to those promulgated to establish a logical outgrowth.
- 30 EPA argues that the Environmental Petitioner’s challenge is not ripe for review because “the question of whether some general permit somewhere might fail to assure that pollutants are reduced to the maximum extent practicable is not ripe for review.” But we are not addressing the merits of any specific permit. Rather, the question before us “is purely one of statutory interpretation that would not benefit from further factual development of the issues presented.” *Whitman v. American Trucking*, 531 U.S. 457, 479, 121 S.Ct. 903, 149 L.Ed.2d 1 (2001). Specifically, we are addressing whether EPA, in promulgating the Phase II Rule, has accomplished the substantive controls for municipal stormwater that Congress mandated in § 402(p) of the Clean Water Act. As we held in *Natural Resources Defense Council v. EPA*, 966 F.2d at 1296–97, 1308, this question is ripe for review.
- 31 Petitioners suggest that EPA should be held to the standard it espoused to procure judicial approval for the Phase I program. In 1991, responding to NRDC’s assertion that the Phase I Rule failed to set “hard criteria” for review of MS4 stormwater programs, EPA responded that “inadequate proposals will result in the denial of permit applications.” Respondent’s Brief at 67, *Natural Res. Def. Council v. EPA*, 966 F.2d 1292 (9th Cir.1992) (Nos. 91–70200, 91–70176, & 90–70671). Petitioners contend that this court relied on that representation in ruling for EPA on that issue. *Natural Res. Def. Council v. EPA*, 966 F.2d at 1308 n. 17 (“Individual NPDES permit writers ... will decide whether application proposals are adequate....”).

32 That the Rule allows a permitting authority to review an NOI is not enough; every permit must comply with the standards articulated by the Clean Water Act, and unless every NOI issued under a general permit is reviewed, there is no way to ensure that such compliance has been achieved.

The regulations do require NPDES permitting authorities to provide operators of small MS4s with “menus” of management practices to assist in implementing their Minimum Measures, *see* 40 C.F.R. § 123.35(g), but again, nothing requires that the combination of items that the operator of a small MS4 selects from this “menu” will have the combined effect of reducing discharges to the maximum extent practicable.

Nor is the availability of citizen enforcement actions a substitute for EPA's enforcement responsibility, especially because, as discussed below, the Rule does not require that NOIs be publicly available. Absent review on the front end of permitting, the general permitting regulatory program loses meaning even as a procedural exercise.

33 EPA identifies no other general permitting program that leaves the choice of substantive pollution control requirements to the regulated entity, and we are not persuaded by the analogy it urges to the traditional model of general permitting (where NOIs routinely are not reviewed), because, as we have noted, the Phase II general permit model is substantially dissimilar.

34 In its petition for rehearing, EPA argues for the first time that because the regulations require NPDES Permitting Authorities to include in general permits “any additional measures necessary” to ensure that the maximum extent practicable standard is met, 40 C.F.R. §§ 123.35(h)(1), 123.35(f) (incorporating by reference the “maximum extent practicable” requirement of 40 C.F.R. §§ 122.34(a)), 122.34(f) (requiring small MS4s to comply with additional measures), the Phase II Rule ensures that discharges will be reduced to the maximum extent practicable.

The trouble with EPA's reasoning is that the Phase II Rule defines the “maximum extent practicable” standard in such a way that no “additional measures” will ever be necessary under § 123.35(h)(1). While a Permitting Authority may impose additional measures, nothing compels it to do so because, merely by implementing the best management practices that the operator of a small MS4 has chosen for itself, that small MS4 will already have met the “maximum extent practicable” standard. *See* 40 C.F.R. § 122.34(a).

35 EPA argues for the first time in its petition for rehearing that NOIs will be publicly available under 40 C.F.R. § 122.34(g)(2). Addressing operators of regulated small MS4s, this section provides: “You must make your records, including a description of your storm water management program, available to the public at reasonable times during regular business hours.” While this section does seem to provide for the public availability of a small MS4's records, we are troubled that nothing in EPA's initial briefs indicated that EPA considered NOIs to be subject to this section. We normally defer to an agency's interpretations of its own regulations, but we may decline to defer to the *post hoc* rationalizations of appellate counsel. *See, e.g., Martin v. Occupational Safety and Health Review Commission*, 499 U.S. 144, 150, 156, 111 S.Ct. 1171, 113 L.Ed.2d 117 (1991). If EPA intends this section to provide for the public availability of NOIs—for example because it intends NOIs to be among the records subject to this section—it may clarify on remand.

36 Agency determinations based on the record are reviewed under the “arbitrary and capricious” standard. 5 U.S.C. § 706(2)(A). The standard is narrow and the reviewing court may not substitute its judgment for that of the agency. *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851. However, the agency must articulate a rational connection between the facts found and the conclusions made. *Washington v. Daley*, 173 F.3d 1158, 1169 (9th Cir.1999). The reviewing court must determine whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment. *Marsh*, 490 U.S. at 378, 109 S.Ct. 1851. The court may reverse under the “arbitrary and capricious” standard only if the agency:

has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

Motor Vehicle Mfrs. Ass'n, 463 U.S. at 43, 103 S.Ct. 2856.

37 EPA explains that the Group A facilities were not regulated with the other Phase I sources because EPA used Standard Industrial Classification Index (SIC) codes in defining the universe of regulated industrial activities: “By relying on SIC codes, a classification system created to identify industries rather than environmental impacts from these industries [sic] discharges, some types of storm water discharges that might otherwise be considered ‘industrial’ were not included in the existing NPDES storm water program.” 64 Fed. Reg. at 68,779.

38 As discussed in footnote 37, Group A facilities were not regulated with other Phase I industrial sources based on a government coding system used to distinguish different types of industry (without reference to their similar environmental impacts). *See* 64 Fed. Reg. at 68,779.

39 “In identifying potential categories of sources for designation in today's notice, EPA considered designation of discharges from Group A and Group B facilities. EPA applied three criteria to each potential category in both groups to determine the need for designation: (1) The likelihood for exposure of pollutant sources included in that category, (2) whether such sources

were adequately addressed by other environmental programs, and (3) whether sufficient data were available at this time on which to make a determination of potential adverse water quality impacts for the category of sources. As discussed previously, EPA searched for applicable nationwide data on the water quality impacts of such categories of facilities....”

“EPA’s application of the first criterion showed that a number of Group A and B sources have a high likelihood of exposure of pollutants.... Application of the second criterion showed that some categories were likely to be adequately addressed by other programs.”

“After application of the third criterion, availability of nationwide data on the various storm water discharge categories, EPA concluded that available data would not support any such nationwide designations. While such data could exist on a regional or local basis, EPA believes that permitting authorities should have flexibility to regulate only those categories of sources contributing to localized water quality impairments.... If sufficient regional or nationwide data become available in the future, the permitting authority could at that time designate a category of sources or individual sources on a case-by-case basis.” 64 Fed. Reg. at 68,780.

40 *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters*, EPA guidance paper 840–B–93–001c (Jan. 1993), available at <http://www.epa.gov/owow/nps/mmgil/index.html> (last visited Sept. 18, 2002) (“Coastal Waters”).

41 The provision provides in full as follows:

Silvicultural point source means any discernible, confined and discrete conveyance related to rock crushing, gravel washing, log sorting, or log storage facilities which are operated in connection with silvicultural activities and from which pollutants are discharged into waters of the United States. The term does not include non-point source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance from which there is natural runoff. However, some of these activities (such as stream crossing for roads) may involve point source discharges of dredged or fill material which may require a CWA section 404 permit (See 33 CFR 209.120 and part 233).

40 C.F.R. § 122.27(b)(1).

42 Nonpoint Source Pollution: The Nation’s Largest Water Quality Problem, EPA841–F–96–004A (“Pointer # 1”) (“The latest *National Water Quality Inventory* indicates that agriculture is the leading contributor to water quality impairments, degrading 60 percent of the impaired river miles and half of the impaired lake acreage surveyed by states, territories, and tribes.”).

43 The Municipal Petitioners join in asserting the “regulatory basis” claim at Part II(F)(1).

44 NRDC argues that this claim is not only meritless for the reasons stated by EPA, but also frivolous, since industry petitioner National Association of Home Builders, as a member of the FACA Phase II Subcommittee, participated in and affirmed that such consultation took place.

45 *See Natural Res. Def. Council*, 966 F.2d at 1306 (remanding EPA’s decision to regulate only construction sites disturbing more than five acres, after EPA had initially proposed to regulate all sites disturbing more than one acre).

46 The Industry Petitioners contend that EPA lacked authority to issue the Phase II regulation of construction sites based on a process EPA itself characterized as “separate and distinct” from the development of the Report to Congress. 64 Fed. Reg. at 68,732. They add that the Phase II Rule was not “based on” the 1999 Report ultimately requested by Congress in the Appropriations Act, since EPA’s report in response was released on the very day that the final Phase II Rule was published.

47 Since we have already determined that AF & PA lacks standing to raise any of its claims, *see* Section D above, this discussion pertains to the remaining Industry Petitioner, National Association of Home Builders.

48 Although the issue of Municipal Petitioners’ standing has not been raised by the parties, we are obliged to consider it to determine whether the case-or-controversy requirement of Article III is satisfied. *See, e.g., Boeing Co. v. Van Gemert*, 444 U.S. 472, 488 n. 4, 100 S.Ct. 745, 62 L.Ed.2d 676 (1980); *Juidice v. Vail*, 430 U.S. 327, 331, 97 S.Ct. 1211, 51 L.Ed.2d 376 (1977).

49 Even if the statute *were* ambiguous, we would defer to EPA’s reasonable interpretation. *Chevron*, 467 U.S. at 843–44, 104 S.Ct. 2778.

50 The Industrial Petitioners argue that although the Phase I authorizing statute required EPA to regulate all sources associated with “industrial activity,” Congress expressly directed that the Phase II regulatory program be focused on sources that require regulation “to protect water quality.” They assert that because EPA’s rule ignores the variability of water quality impacts nationwide, the Rule is not appropriately targeted on the protection of water quality.

51 Petitioners heavily critique two studies relied on by EPA that dealt specifically with the water quality impacts of small construction sites, noting that one concludes it is impossible to generalize about the impacts of small sites, Lee H. MacDonald, *Technical Justification for Regulating Construction Sites 1–5 Acres in Size*, July 22, 1997, and that the other merely concludes that small sites “can have” significant effects if erosion controls are not implemented, David W. Owens, et al., *Soil Erosion*

from *Small Construction Sites*. Petitioners contend that the latter study was managed with no erosion controls, intentionally producing worst-case sediment runoff and unreasonable estimates of actual sediment yields for small sites nationwide. EPA vigorously defends the studies.

- 52 NRDC adds that notwithstanding the clear interest of the National Association of Home Builders (“NAHB,” one of the Industry Petitioners), NAHB’s multi-year participation in the FACA Phase II Subcommittee Small Construction and No-Exposure Sites Work Group, and NAHB’s own submission of detailed comments on the proposed Rule, NAHB failed to enter into the administrative record any study contradicting the proposition that small construction sites cause water quality problems. NRDC points to the record’s showing that NAHB had itself proposed that regulation of construction sites of two acres or greater was appropriate, and contends that this is thus not a dispute over whether small construction sites should be regulated on a nationwide basis, but instead a technical disagreement over whether EPA should establish a one-acre threshold or a different threshold on a similar small scale.
- 53 Whitney Brown and Deborah Caraco, *Controlling Stormwater Runoff Discharges from Small Construction Sites: A National Review*, Task 5 Final Report submitted by the Center for Watershed Protection to the EPA Office of Wastewater Management, March 1997, IP E.R. 633, 643.
- 54 EPA adds that operators of small sites in areas unlikely to suffer adverse impacts may apply for a permit waiver if little or no rainfall is expected during the period of construction (the “rainfall erosivity waiver”) or if regulation is unnecessary based on a location-specific evaluation of water quality (the “water quality waiver”). 64 Fed. Reg. at 68,776.
- 55 EPA also implies permission to regulate for potential cumulative impacts of small sites from the past directive of this court. When the Phase I industrial discharge regulations were challenged, we found no record data to support that rule’s exemption of construction activities on less than five acres and held that small sites did not categorically qualify for a *de minimis* exemption because “even small construction sites can have a significant impact on local water quality.” *Natural Res. Def. Council*, 966 F.2d at 1306.
- 56 The “substantial evidence” standard requires a showing of such relevant evidence as a reasonable mind might accept as adequate to support a conclusion. *Eldred v. Massanari*, 253 F.3d 1152, 1156 (9th Cir.2001).
- 57 EPA further argues that even if the waiver provision were properly characterized as an evidentiary presumption, it should be sustained because the record demonstrates that the presumed fact of the water quality impact of small sites is more likely true than not.
- 58 EPA notes that the Phase II Rule empowers regional permitting authorities to regulate local sources of these types known to be responsible for harmful water quality impacts via the continuing “residual designation” authority (an aspect of the Rule that Petitioners also challenge).
- 59 TMDLs are pollutant loading limits established by NPDES permitting authorities under the Clean Water Act for waters that do not meet a water quality standard due to the presence of a pollutant. See 33 U.S.C. § 1313(d).
- 60 This section enables a NPDES permitting authority to designate for regulation: “[a] discharge for which the Administrator or the State, as the case may be, determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.” 33 U.S.C. § 1342(p)(2)(E).
- 61 Notably, Industry Petitioner NAHB itself took the position during Phase II Subcommittee proceedings that the power to designate additional sources survived the promulgation of the Phase II Rule. In a 1996 comment letter to EPA, NAHB asserted its understanding that “[t]he permitting authority still reserves the right to designate additional sources if they are shown to be a contributor of water quality impairment.” NRDC Supplemental Excerpts of Record at 58.
- 62 The full text of § 402(p)(6), which specifically authorizes the Phase II program, reads: “Not later than October 1, 1993, the Administrator, in consultation with State and local officials, shall issue regulations (based on the results of the studies conducted under paragraph (5)) which designate stormwater discharges, other than those discharges described in paragraph (2), to be regulated to protect water quality and shall establish a comprehensive program to regulate such designated sources. The program shall, at a minimum, (A) establish priorities, (B) establish requirements for State stormwater management programs, and (C) establish expeditious deadlines. The program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate.” 33 U.S.C. § 1342(p)(6).
- 63 Petitioners further argue that even if EPA could preserve the case-by-case authority conferred in § 402(p)(2)(E), that section confers authority only to regulate “a discharge” determined to threaten water quality, not a category of discharges. However, we agree with respondent-intervenor NRDC’s argument that § 402(p)(2)(E) does not preclude EPA from designating entire categories of sources. Petitioners’ argument follows from its reliance on the fact that § 402(p)(2)(E) refers to “discharge” in the singular rather than the plural to conclude that EPA may only designate sources meeting the § 402(p)(2)(E) description on a case-by-case basis. But all five of the § 402(p)(2)(5) categories refer to “discharge” in the singular, even in reference to discharges clearly intended for categorical regulation, like “a discharge from a municipal separate storm sewer system serving

a population of 250,000 or more.” 33 U.S.C. § 1342(p)(2)(C). The error in petitioners' interpretation is exposed by 1 U.S.C. § 1, which provides that “[i]n determining the meaning of any Act of Congress, unless the context indicates otherwise—words importing the singular include and apply to several persons, parties, or things.”

64 This case was reversed in relevant part by the Supreme Court in *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 476, 121 S.Ct. 903, 149 L.Ed.2d 1 (2001).

65 “[T]oday's proposal would encourage [voluntary] control of stormwater discharges ... unless the discharge (or category of discharges) is individually or locally designated as described in the following section. The necessary data to support designation could be available on a local, regional, or watershed basis and would allow the NPDES permitting authority to designate a category of sources or individual sources on a case-by-case basis. If sufficient nationwide data [becomes] available in the future, EPA could at that time designate additional categories of industrial or commercial sources on a national basis. EPA requests comment on the three-pronged analysis used to assess the need to designate additional industrial or commercial sources and invites suggestions regarding watershed-based designation.” 63 Fed. Reg. at 1588.

66 Our consideration of the issue at all may be gratuitous, since petitioners failed to submit timely comment disputing the adequacy of EPA's consideration of economic impacts on small businesses proposed at 63 Fed. Reg. at 1605–07. *United States v. L.A. Tucker Truck Lines*, 344 U.S. 33, 37, 73 S.Ct. 67, 97 L.Ed. 54 (1952) (“[C]ourts should not topple over administrative decisions unless the administrative body not only has erred but has erred against objection made at the time appropriate under its practice.”).

ATTACHMENT 23

 KeyCite Yellow Flag - Negative Treatment

Distinguished by [County of Sonoma v. Commission on State Mandates](#), Cal.App. 1 Dist., November 21, 2000

45 Cal.App.4th 1802, 53 Cal.Rptr.2d 521, 96 Cal. Daily Op. Serv. 3995, 96 Daily Journal D.A.R. 6437

CITY OF SAN JOSE, Plaintiff and Respondent,

v.

THE STATE OF CALIFORNIA, Defendant and Appellant; KATHLEEN
CONNELL, as Controller, etc., et al., Real Parties in Interest and Appellants.

No. H014099.

Court of Appeal, Sixth District, California.

Jun 3, 1996.

SUMMARY

The trial court granted a city's petition for a writ of mandate against the state, ruling that [Gov. Code, § 29550](#), which authorizes counties to charge cities and other local entities for the costs of booking into county jails persons who had been arrested by employees of the cities and other entities, established a new program or higher level of service under [Cal. Const., art. XIII B, § 6](#), which imposes limits on the state's authority to mandate new programs or increased services on local governmental entities. (Superior Court of Santa Clara County, No. CV734424, Taketsugu Takei, Judge.)

The Court of Appeal reversed with directions to the trial court to deny the petition. The court held that [Gov. Code, § 29550](#), did not establish a new program or higher level of service under [Cal. Const., art. XIII B, § 6](#), since the shift in funding was not from the state to the local entity but from county to city. At the time [Gov. Code, § 29550](#), was enacted, and long before, the financial and administrative responsibility associated with the operation of county jails and detention of arrestees was borne entirely by the county ([Gov. Code, § 29602](#)). In this respect, counties are not considered agents of the state. Moreover, Cal. Const., art. XIII B, treats cities and counties alike as "local government." Thus, for purposes of mandate subvention analysis, counties and cities were intended to be treated alike as part of "local government"; both are considered local agencies or political subdivisions of the state. Nothing in Cal. Const., art. XIII B prohibits the shifting of costs between local governmental entities. The court also held that the statute did not shift costs so as to constitute a state "mandate" within the meaning of [Cal. Const., art. XIII B, § 6](#). The pertinent words of the statute state that "a county may impose a fee on a city." Thus, it does not require that counties impose fees on other local entities, but only authorizes them to do so. The court further held that the Legislative Counsel's determination that [Gov. Code, § 29550](#), imposed a state mandated local program was not determinative of the ultimate issue whether the enactment constituted a state mandate under [Cal. Const., art. XIII B, § 6](#). (Opinion by Bamattre-Manoukian, J., with Cottle, P. J., and Mihara, J., concurring.)

HEADNOTES

Classified to California Digest of Official Reports

(1)

Administrative Law § 138--Judicial Review and Relief--Appellate Court-- State Mandate Proceedings.

[Gov. Code, § 17559](#), requires that the trial court review decisions of the Commission on State Mandates under the substantial evidence standard. Where the substantial evidence test is applied by the trial court, appellate courts are generally confined to inquiring whether substantial evidence supports the trial court's findings and judgment. However, the appellate court independently reviews the trial court's legal conclusions about the meaning and effect of constitutional

and statutory provisions. The question whether a statute constitutes a state mandated program is a purely legal question, warranting de novo review.

(2)

Constitutional Law § 39--Distribution of Governmental Powers-- Legislative Power.

Unlike the federal Constitution, which is a grant of power to Congress, the California Constitution is a limitation or restriction on the powers of the Legislature. Two important consequences flow from this fact. First, the entire law-making authority of the state, except the People's right of initiative and referendum, is vested in the Legislature, and that body may exercise any and all legislative powers that are not expressly, or by necessary implication denied to it by the Constitution. Secondly, all intendments favor the exercise of the Legislature's plenary authority: if there is any doubt as to the Legislature's power to act in any given case, the doubt should be resolved in favor of the Legislature's action. Such restrictions and limitations imposed by the Constitution are to be construed strictly and are not to be extended to include matters not covered by the language used.

(3)

State of California § 11--Fiscal Matters--State Mandated Programs--What Constitutes--Reimbursement to County for Costs of Booking City Arrestees.

[Gov. Code, § 29550](#), which authorizes counties to charge cities and other local entities for the costs of booking into county jails persons who had been arrested by employees of the cities and other entities, does not establish a new program or higher level of service under [Cal. Const., art. XIII B, § 6](#), which imposes limits on the state's authority to mandate new programs or increased services on local governmental entities, since the shift in funding is not from the State to the local entity but from county to city. At the time [Gov. Code, § 29550](#), was enacted, and long before, the financial and administrative responsibility associated with the operation of county jails and detention of prisoners was borne entirely by the county ([Gov. Code, § 29602](#)). In this respect, counties are not considered agents of the state. Moreover, [Cal. Const., art. XIII B](#), treats cities and counties alike as “local government.” Thus, for purposes of subvention analysis, it is clear that counties and cities were intended to be treated alike as part of “local government”; both are considered local agencies or political subdivisions of the state. Nothing in [Cal. Const., art. XIII B](#) prohibits the shifting of costs between local governmental entities.

[See [9 Witkin, Summary of Cal. Law \(9th ed. 1989\) Taxation, § 123](#).]

(4)

State of California § 11--Fiscal Matters--State Mandated Programs--What Constitutes--Reimbursement of County for Booking City Arrestees.

[Gov. Code, § 29550](#), which authorizes counties to charge cities and other local entities for the costs of booking into county jails persons who had been arrested by employees of the cities and other entities, does not shift costs so as to constitute a state “mandate” within the meaning of [Cal. Const., art. XIII B, § 6](#), which imposes limits on the State's authority to mandate new programs or increased services on local governmental entities. The pertinent words of the statute state that “a county may impose a fee on a city.” Thus, it does not require that counties impose fees on other local entities, but only authorizes them to do so. Although as a practical result of the authorization under [Gov. Code, § 29550](#), a city is required to bear costs it did not formerly bear, a mandate cannot be read into language that is plainly discretionary. [Cal. Const., art. XIII B, § 6](#), was not intended to entitle local entities to reimbursement for all increased costs resulting from legislative enactments, but only those costs mandated by a new program or an increased level of service imposed upon them by the State.

(5)

Constitutional Law § 39--Distribution of Governmental Powers-- Legislative Power--Constitutional Restrictions--Strict Construction:State of California § 11--Fiscal Matters--State Mandated Programs.

Rules of constitutional interpretation require that constitutional limitations and restrictions on legislative power are to be construed strictly and are not to be extended to include matters not covered by the language used. Policymaking authority is vested in the Legislature, and neither arguments as to the wisdom of an enactment nor questions as to the motivation of the Legislature can serve to invalidate particular legislation. Under these principles, there is no basis for applying [Cal. Const., art. XIII B, § 6](#), which imposes limits on the state's authority to mandate new programs or increased services on local governmental entities, as an equitable remedy to cure the perceived unfairness resulting from political decisions on funding priorities.

(6)

State of California § 11--Fiscal Matters--State Mandated Programs--What Constitutes--Reimbursement of County For Booking City Arrestees

The Legislative Counsel's determination that [Gov. Code, § 29550](#), which authorizes counties to charge cities and other local entities for the costs of booking into county jails persons who had been arrested by employees of the cities and other entities, imposed a state mandated local program was not determinative of the ultimate issue whether the enactment constituted a state mandate under [Cal. Const., art. XIII B, § 6](#). The legislative scheme contained in [Gov. Code, § 17500](#) et seq., makes clear that this issue is to be decided by the State Commission on Mandates. The statutory scheme contemplates that the commission, as a quasi-judicial body, has the sole and exclusive authority to adjudicate whether a state mandate exists. Thus, any legislative findings are irrelevant to the issue of whether a state mandate exists.

COUNSEL

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Joan R. Gallo, City Attorney, George Rios, Assistant City Attorney, David J. Stock and Joseph DiCiuccio, Deputy City Attorneys, for Plaintiff and Respondent.

Burke, Williams & Sorensen, J. Robert Flandrick, Deanna L. Ballesteros and Timothy L. Davis as Amici Curiae on behalf of Plaintiff and Respondent. *1806

BAMATTRE-MANOUKIAN, J.

In 1979 the voters of the State of California (State) adopted an initiative which added article XIII B to the state Constitution. This followed in the wake of Proposition 13, which had added article XIII A the previous year. [Section 6 of article XIII B](#) imposed limits on the State's authority to mandate new programs or increased services on local governmental entities, whose taxing powers had been severely restricted by Proposition 13.¹ Under [section 6](#), whenever the state mandated such a program, the State would be required to reimburse the local entity for the costs of the program.

The present proceeding arose after the Legislature enacted [Government Code section 29550](#) in 1990 (hereafter, [section 29550](#)). [Section 29550](#) authorized counties to charge cities, and other local entities such as school districts, for the costs of booking into county jails persons who had been arrested by employees of the cities and other entities. The City of San Jose (City) claims that at the time of trial it had incurred expenses of over \$10 million as a result of costs imposed pursuant to [section 29550](#).

City contends [section 29550](#) is a state mandated program under [article XIII B, section 6](#), and that the State must reimburse these costs. The State claims that [section 29550](#) simply authorizes allocation of booking costs, which formerly were borne solely by the counties, among all the local entities responsible for the arrests; since there is no mandated shifting of costs from state to local government, [section 29550](#) does not come within [section 6](#) and no reimbursement is necessary.

We agree with the state and we therefore reverse the judgment of the superior court which had granted City's petition for a writ of mandate. We direct that the court issue an order denying the petition and enter judgment for the State.

Background

Articles XIII A and XIII B of the Constitution were intended to be complementary provisions with the general purpose of protecting taxpayers by restricting government's power both to levy and to spend taxes for public purposes. (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 486-487 [280 Cal.Rptr. 92, 808 P.2d 235]; *City of Sacramento v. State of California* (1990) 50 Cal.3d 51, 59, fn. 1 [266 Cal.Rptr. 139, 785 P.2d 522].) *1807

In 1978 article XIII A was added to the California Constitution through the adoption of Proposition 13, an initiative measure aimed at controlling ad valorem property taxes and the imposition of new “special taxes.” (*County of Fresno v. State of California, supra*, 53 Cal.3d at p. 486.) In recognition of the fact that Proposition 13 would radically reduce county revenues, the State took steps to assume responsibility for programs previously financed by local government. (*County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 61 [233 Cal.Rptr. 38, 729 P.2d 202].)

The following year, through another statewide election in 1979, article XIII B was added to the Constitution. Article XIII B placed limitations on the ability of both state and local governments to appropriate funds for expenditures, effectively freezing appropriations at both the state and local level. (Cal. Const., art. XIII B, § 8, subd. (h); *id.*, § 2.) Further, section 6 was included in article XIII B in order to protect shrinking tax revenues of local government from state mandates which would require expenditure of such revenues. (*County of Fresno v. State of California, supra*, 53 Cal.3d at p. 487.) “[It] was intended to preclude the state from shifting financial responsibility for carrying out governmental functions onto local entities that were ill equipped to handle the task.” (*Ibid.*)

Section 6 provides: “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service”

In order to implement section 6, the Legislature enacted Government Code sections 17500-17630. Those sections set forth a procedure for determining whether a particular statute imposes state-mandated costs on a local entity within the meaning of section 6. Section 17525 created the Commission on State Mandates (Commission), which has the sole purpose of hearing and deciding on claims by local government that the local entity “is entitled to be reimbursed by the state for costs” as required by section 6. (Gov. Code, § 17551, subd. (a).)

A local entity seeking reimbursement must first file a claim with the Commission. The Commission then holds a public hearing, takes evidence and decides whether the particular state enactment mandates a “new program or increased level of service.” (Gov. Code, §§ 17551, 17553, 17556.) The first claim made with respect to a particular statute becomes a “test claim” and its adjudication then governs all subsequent claims based on the same statute. (Gov. Code, § 17521; *1808 *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 332 [285 Cal.Rptr. 66, 814 P.2d 1308].) If the claim is rejected, the local entity may bring an action in administrative mandamus in superior court to challenge the Commission's determination. (Gov. Code, § 17559.)

Section 29550 was enacted in 1990, effective as of July 1 of that year. It states in relevant part: “Notwithstanding any other provision of law, a county may impose a fee upon a city, [or other local entity], for reimbursement of county expenses incurred with respect to the booking or other processing of persons arrested by an employee of that city, ... where the arrested persons are brought to the county jail for booking or detention. The fee imposed by a county pursuant to this section shall not exceed the actual administrative costs, including applicable overhead costs”

In response to the passage of section 29550, the County of Santa Clara enacted Ordinance No. NS-300.470. It provides that “(a) There is hereby imposed a fee upon every city [or other local entity], equal to the administrative costs, including applicable overhead costs of booking or other processing at any county jail facility of every person arrested by an

employee of such city ... and brought to such county jail facility for booking or detention.” The ordinance further provides that “(c) [s]uch fee shall apply to every booking or processing of a person at a county jail facility on and after July 1, 1990.”

In October of 1991, City, joined by the Cities of Santa Cruz and Emeryville, filed a test claim with the Commission, claiming that [section 29550](#) imposed on City “costs mandated by the state” (Gov. Code, § 17551, subd. (a)), which were reimbursable under [section 6](#). City alleged it had incurred costs in excess of \$3 million for the first year following the effective date of Ordinance NS-300.470.

The gist of the argument in City's test claim was that counties function as political subdivisions and agents of the State, charged with enforcement of the state's criminal laws. Detaining and booking arrestees is an integral part of this law enforcement process. By authorizing counties to require cities to bear these costs, [section 29550](#) mandated a shift of fiscal responsibility onto local entities, in violation of the purposes underlying [section 6](#).

The Commission heard the matter on May 28, 1992, and issued a proposed statement of decision in which it concluded that [section 29550](#) does not create a reimbursable state-mandated program within the meaning of [section 6](#). The Commission found that “maintenance of jails and detention of prisoners have always been a local matter charged to local government, and that financial and administrative responsibility for the county jail facility are *1809 borne by the county.” The Commission further found that “the state and counties are not synonymous entities for the maintenance of the jails and detention of prisoners.... [¶] In sum, cities and counties are both forms of local government.” Therefore, “the imposition of costs authorized by [Government Code section 29550](#) results in a shift or reallocation of funds between local governmental entities that benefit from the county jail facility.... [¶] ... [T]he reimbursement required by article XIII B of the California Constitution does not apply in this situation because that provision is concerned with the relationship between state and local governments; it does not address legislation that affects financial relationships among local governments.”

Furthermore, the Commission found that [section 29550](#) was not a statemandated program because “the section is clearly discretionary in empowering a county to impose a booking or other processing fee upon a city [Government Code section 29550](#) does not require, but merely authorizes, counties to establish booking fees. Each county elects whether to charge cities and other entities for booking and detention services provided at a county jail.” The Commission's proposed statement of decision was unanimously adopted by the Commission as its decision on July 23, 1992.

On September 7, 1993, City filed a petition for a writ of mandate in superior court. The petition alleged that in denying City's claim the Commission misinterpreted the Constitution and [section 29550](#) as well as various decisions of California courts. City asked 1) that the Commission's decision be vacated, 2) that the court find that [section 29550](#) mandated a new program for which the State was obligated to reimburse City under [section 6](#), and 3) that the State be ordered to reimburse City for all booking and processing fees incurred to date.

City named both the state and the Commission as respondents and included the state Controller, the Department of Finance and the Director of Finance as real parties in interest. The matter was fully briefed and, following a hearing on October 28, 1993, the court took it under submission.

On November 23, 1993, the superior court issued a decision in which it found that “shifting of the costs of booking and processing arrestees from counties to cities is a new program which is state mandated as opined by the legislative counsel. To hold otherwise is to deny reality and to ignore the substance of the law and follow only the form. The county is the agent of the state and is responsible for administering the state's criminal justice system.” Judgment was entered for the City on May 4, 1994, and a peremptory writ of mandate issued granting City the relief requested. *1810

The State and the Commission have appealed. We granted permission to a number of other California cities to file an amicus curiae brief in support of City.

Standard of Review

(1) [Government Code section 17559](#) governs the proceeding below and requires that the trial court review the decision of the Commission under the substantial evidence standard. Where the substantial evidence test is applied by the trial court, we are generally confined to inquiring whether substantial evidence supports the court's findings and judgment. (*County of Los Angeles v. Commission on State Mandates* (1995) 32 Cal.App.4th 805, 814 [38 Cal.Rptr.2d 304].) However, we independently review the superior court's legal conclusions about the meaning and effect of constitutional and statutory provisions. (*Greenwood Addition Homeowners Assn. v. City of San Marino* (1993) 14 Cal.App.4th 1360, 1367 [18 Cal.Rptr.2d 350].) Here the question whether [section 29550](#) is a state-mandated program within the meaning of [section 6](#) is a purely legal question, warranting de novo review.

(2) In interpreting a legislative enactment with respect to a provision of the California Constitution, we bear in mind the following fundamental principles: “ ‘Unlike the federal Constitution, which is a grant of power to Congress, the California Constitution is a limitation or restriction on the powers of the Legislature. [Citations.] Two important consequences flow from this fact. First, the entire law-making authority of the state, except the people's right of initiative and referendum, is vested in the Legislature, and that body may exercise any and all legislative powers which are not expressly, or by necessary implication denied to it by the Constitution. [Citations.] ... [¶] Secondly, all intendments favor the exercise of the Legislature's plenary authority: ‘If there is any doubt as to the Legislature's power to act in any given case, the doubt should be resolved in favor of the Legislature's action. Such restrictions and limitations [imposed by the Constitution] are to be construed strictly, and are not to be extended to include matters not covered by the language used.’ [Citations.]” (*Pacific Legal Foundation v. Brown* (1981) 29 Cal.3d 168, 180 [172 Cal.Rptr. 487, 624 P.2d 1215], quoting *Methodist Hosp. of Sacramento v. Saylor* (1971) 5 Cal.3d 685, 691 [97 Cal.Rptr. 1, 488 P.2d 161], italics omitted.)

Discussion

We must determine whether [section 29550](#) constitutes a “new program or higher level of service” which is “mandated” by the State on local government within the meaning intended by [section 6](#) of the Constitution. *1811 (3) As to the first part of the question, whether [section 29550](#) establishes a new program or higher level of service, the leading case of *Lucia Mar Unified School Dist. v. Honig* (1988) 44 Cal.3d 830 [244 Cal.Rptr. 677, 750 P.2d 318] (*Lucia Mar*) provides a useful focus for discussion.

Lucia Mar involved [Education Code section 59300](#), passed in 1981, which required local school districts to contribute part of the cost of educating district students at state schools for the severely handicapped. Prior to 1979 the school districts had been required by statute to contribute to the education of students in their districts who attended state schools. (Former Ed. Code, §§ 59021, 59121, 59221.) However, those statutes were repealed following the passage of Proposition 13 in 1978, and in 1979 the state assumed full responsibility for funding the schools. When article XIII B was added to the Constitution, effective July 1, 1980, the State had full financial responsibility for operating the state schools, and this was the status when [section 59300](#) was enacted in 1981.

In 1984 the Lucia Mar Unified School District and other school districts filed a test claim asserting that [Education Code section 59300](#) required them to make payments for a “ ‘new program or increased level of service,’ ” thus entitling them to reimbursement under [section 6](#). The Commission denied the claim, finding that, although increased costs had been imposed on the district, [section 59300](#) did not establish any “ ‘new program or increased level of service.’ ” This decision was affirmed by the superior court, which found that [section 59300](#) did not mandate a new program or higher level of service but simply called for an “ ‘adjustment of costs.’ ” (*Lucia Mar, supra*, 44 Cal.3d at p. 834.) The Court of Appeal also affirmed, reasoning that a shift in the funding of an existing program is not a “new program.”

The Supreme Court reversed the judgment in favor of the State. The court recognized that “... local entities are not entitled to reimbursement for all increased costs mandated by state law, but only those costs resulting from a new program or an

increased level of service imposed upon them by the state.” (*Lucia Mar, supra*, 44 Cal.3d at p. 835.) “‘Program,’” as used in article XIII B of the California Constitution, is “one that carries out the ‘governmental function of providing services to the public, or laws which, to implement a state policy, impose unique requirements on local governments and do not apply generally to all residents and entities in the state.’” (*Lucia Mar, supra*, at p. 835, quoting *County of Los Angeles v. State of California, supra*, 43 Cal.3d at p. 56.) Under this definition the high court found that the contributions called for in [Education Code section 59300](#) were used to fund a “program.” This was so even though the school district was required only ***1812** to contribute funds to the state-operated schools rather than to administer the program itself.

The court found further that the program established by [Education Code section 59300](#) was a “new program” insofar as the school district was concerned since, at the time it was enacted in 1981, school districts were not required to contribute to the education of their students at the state-operated schools. The court concluded that a shift in funding of an existing program from the state to a local entity constitutes a new program within the meaning of section 6. “The intent of the section [section 6] would plainly be violated if the state could, while retaining administrative control of programs it has supported with state tax money, simply shift the cost of the programs to local government on the theory that the shift does not violate section 6 ... because the programs are not ‘new.’ Whether the shifting of costs is accomplished by compelling local governments to pay the cost of entirely new programs created by the state, or by compelling them to accept financial responsibility in whole or in part for a program which was funded entirely by the state before the advent of article XIII B, the result seems equally violative of the fundamental purpose underlying section 6 of that article.” (*Lucia Mar, supra*, 44 Cal.3d at p. 836, fn. omitted.)²

City and the amici curiae cities contend that the principles expressed in *Lucia Mar* compel the same result here. [Section 29550](#), they argue, is a classic example of the state attempting to shift to local entities the financial responsibility for providing public services. As in *Lucia Mar*, the program is “new” as to City because City has not formerly been required to contribute financially to services provided via the booking process. And, as the *Lucia Mar* court explained, it does not matter that City itself is not required to provide the services; a shift in funding of an existing program from the State to the local level qualifies as a “new program” under section 6.

The flaw in City's reliance on *Lucia Mar* is that in our case the shift in funding is not from the State to the local entity but from county to city. In *Lucia Mar*, prior to the enactment of the statute in question, the program was funded and operated entirely by the state. Here, however, at the time [section 29550](#) was enacted, and indeed long before that statute, the financial and administrative responsibility associated with the operation of county jails and detention of prisoners was borne entirely by the county. In the recent case of ***1813** *County of Los Angeles v. Commission on State Mandates, supra*, 32 Cal.App.4th 805, this distinction is the focus of the court's section 6 analysis.

In *County of Los Angeles*, the court of appeal addressed the question whether [Penal Code section 987.9](#) was a state-mandated program for which counties were entitled to be reimbursed. That statute, enacted in 1977, provided that indigent defendants in capital cases could request funds for investigators and experts to assist in the preparation or presentation of the defense. Prior to 1990, costs of this program were reimbursed to the counties by the state by annual appropriations. In the Budget Act of 1990-1991, however, no appropriation was made and counties were obliged to absorb the costs. The County of Los Angeles filed a test claim with the Commission, arguing that the state's withdrawal of funding for [section 987.9](#) costs constituted an unlawful shifting of financial responsibility for the program from the state to the counties, within the meaning of section 6 and in violation of the Supreme Court's holding in *Lucia Mar*.

The Court of Appeal in *County of Los Angeles* decided first that the requirements of [Penal Code section 987.9](#) were not state mandated, but were mandated by the United States Constitution. As a separate basis for its opinion, however, the court found that the State's withdrawal of funds to reimburse [section 987.9](#) costs was not a “new program” under section 6. The court distinguished *Lucia Mar* as follows: “In *Lucia Mar*, the handicapped school program in issue had been operated and administered by the State of California for many years. The court found primary responsibility rested with the state and that the transfer of financial responsibility from the state through state tax revenues to school districts

through school district tax and assessment revenues in the school district treasuries imposed a new program on school districts.... [¶] In contrast, the program here has never been operated or administered by the State of California. The counties have always borne legal and financial responsibility for implementing the procedures under section 987.9. The state merely reimbursed counties for specific expenses incurred by the counties in their operation of a program for which they had a primary legal and financial responsibility. There has been no shift of costs from the state to the counties and *Lucia Mar* is, thus, inapposite.” (*County of Los Angeles v. Commission on State Mandates*, *supra*, 32 Cal.App.4th at p. 817.)

This analysis applies equally to our case. It has long been the law in California that “the expense of capture, detention and prosecution of persons charged with crime is to be borne by the county” (*County of San Luis Obispo v. Abalone Alliance* (1986) 178 Cal.App.3d 848, 859 [*1814 223 Cal.Rptr. 846].) Government Code section 29602, which was enacted in 1947, provides that “[t]he expenses necessarily incurred in the support of persons charged with or convicted of a crime and committed to the county jail ... and for other services in relation to criminal proceedings for which no specific compensation is prescribed by law are county charges.” (See also *Washington Township Hosp. Dist. v. County of Alameda* (1968) 263 Cal.App.2d 272, 275 [69 Cal.Rptr. 442].) The Penal Code similarly provides that county jails are kept by the sheriffs of the counties in which they are located and that the expenses in providing for prisoners in those jails are to be paid out of the county treasury. (Pen. Code, §§ 4000, 4015.)

City acknowledges that counties have traditionally borne these expenses, but argues that they do so only in their role as agents of the State. Counties, it is argued, are political subdivisions of the State, organized for the purpose of carrying out functions of state government and advancing state policies, particularly in the area of administration of justice. (See, e.g., *Wilkinson v. Lund* (1929) 102 Cal.App. 767, 772 [283 P. 385]; Gov. Code, § 23002; *Marin County v. Superior Court* (1960) 53 Cal.2d 633, 638-639 [2 Cal.Rptr. 758, 349 P.2d 526].) For example, prosecutions take place in county courts but are brought on behalf of the people of the State of California; the state Attorney General has direct supervision over county sheriffs and district attorneys (Cal. Const., art. V, § 13, subd. (b); Gov. Code, §§ 12550, 12560.); and the state asserts substantial control over the operation of county jails. (Pen. Code, §§ 4000 et seq.; 6030 et seq.) Enforcement of the state's criminal laws is a governmental function, the expense of which the state imposes on the county as the administrative arm of the state. (See *Los Angeles Warehouse Co. v. Los Angeles County* (1934) 139 Cal.App. 368, 371 [33 P.2d 1058].) Thus even though the costs of operating county jails and detaining prisoners are paid from the county treasury, City argues those functions are essentially part of a state program. The imposition of those costs on cities therefore constitutes a shift from the state to local government.

This characterization of the county as an agent of the State is not supported by recent case authority, nor does it square with definitions particular to subvention analysis. In *County of Lassen v. State of California* (1992) 4 Cal.App.4th 1151 [6 Cal.Rptr.2d 359], a county sought indemnity from the state for costs of defending against an action by inmates of the county jail alleging inadequate conditions in the jail facility. The county alleged that the State has the ultimate responsibility for setting forth rules and standards governing the operation of jail facilities, and that county jails are used principally to incarcerate persons convicted of or charged with violations of *1815 state law. Further, the county reasoned that “it [was] the agent of the State in enforcing the State's laws against third persons” and that as State's agent in this regard it was entitled to indemnity from its principal for expenditures or losses incurred in discharge of its authorized duties. (*Id.* at p. 1155.)

The Court of Appeal rejected this theory, squarely holding that the costs of operating county jails, including the capture, detention and prosecution of persons charged with crime are to be borne by the counties. (*County of Lassen v. State of California*, *supra*, 4 Cal.App.4th at p. 1156, citing Pen. Code, §§ 4000, 4015; Gov. Code, § 29602; see also *County of San Luis Obispo v. Abalone Alliance*, *supra*, 178 Cal.App.3d at p. 859.) Further, the court observed that the Legislature was entitled to make policy decisions in order to assist counties in bearing the financial burden of certain aspects of running jails, such as providing funding assistance for construction of new facilities; however, the Legislature had not decided

to subsidize the operation of existing facilities or costs associated with their operation. Unless the Legislature otherwise provides, counties are required to bear costs associated with operating county jails. (Gov. Code, § 29602.)

City points out that *Lassen* is not directly relevant for our purposes because the court in that case specifically declined to comment on the question whether costs would be reimbursable under section 6. Apparently that theory of recovery had not been pursued below. (*County of Lassen v. State of California, supra*, 4 Cal.App. 4th at p. 1157.) *Lassen* nonetheless supports State's position that fiscal responsibility for the program in question here rests with the county and not with the State.

More importantly, in analyzing a question involving reimbursement under section 6, the definitions contained in California Constitution, article XIII B and in the legislation enacted to implement it must be deemed controlling. Article XIII B treats cities and counties alike as “local government.” Under section 8, subdivision (d), this term means “any city, county, city and county, school district, special district, authority or other political subdivision of or within the state.” Furthermore, Government Code section 17514 defines “costs mandated by the state” to mean any increased costs that a “local agency” or school district is required to incur. “Local agency” means “any city, county, special district, authority, or other political subdivision of the state.” (Gov. Code, § 17518.) Thus for purposes of subvention analysis, it is clear that counties and cities were intended to be treated alike as part of “local government”; both are considered local agencies or political subdivisions of the State. Nothing in article XIII B prohibits the shifting of costs between local governmental entities. *1816

(4) Furthermore, we do not believe that the shifting of costs here was a state “mandate,” within the meaning of section 6. As the Commission observed, “[t]he pertinent words of the statute state that ‘... a county *may* impose a fee on a city ...’” Thus section 29550 does not require that counties impose fees on other local entities, but only authorizes them to do so. City claims this is too literal an interpretation of the statutory language. If we take a closer look at the circumstances surrounding the enacting of section 29550, City argues, it becomes clear that it was designed to accomplish indirectly the exact result section 6 was intended to prevent.

Section 29550 was added by section 1 of Senate Bill No. 2557. Section 2 of Senate Bill No. 2557 amended Government Code section 77200 to reduce county revenues by reducing the block grants for trial court funding by approximately 10 percent. (Stats. 1990, ch. 466, pp. 2041-2042.) Moreover, Senate Bill No. No. 2557 was part of the overall state “budget package” of 1990-1991, which contained other shortfalls in county funding. In light of these budget cuts in other areas, City argues, the counties basically had no choice but to pass along booking costs as authorized by section 29550. Moreover, as to City the costs incurred are mandated because Ordinance No. NS-300.470, which is authorized by section 29550, is mandatory.

In support of its position, City submitted excerpts from the county board of supervisors meeting where Ordinance No. NS-300.470 was adopted. These excerpts reflect the generally held belief on the part of the Board members that section 29550 was passed to enable counties to make up for state revenue cuts in other programs.

We appreciate that as a practical result of the authorization under section 29550, City is required to bear costs it did not formerly bear. We cannot, however, read a mandate into language which is plainly discretionary. Nor are we persuaded by the argument that budget cuts in other programs trigger the subvention requirement in section 6. Funding decisions are policy choices. (*County of Lassen v. State of California, supra*, 4 Cal.App.4th at p. 1157.) Section 6 was not intended to entitle local entities to reimbursement for *all* increased costs resulting from legislative enactments, but only those costs mandated by a new program or an increased level of service imposed upon them by the State. (*Lucia Mar, supra*, 44 Cal.3d at p. 835.) Section 6 cannot be interpreted to apply to general legislation which has an incidental impact on local agency costs. (*County of Los Angeles v. State of California, supra*, 43 Cal.3d at p. 57.)

(5) A strict construction of section 6 is in keeping with rules of constitutional interpretation, which require that constitutional limitations and restrictions on legislative power “ ’ ” are to be construed strictly, and are not to *1817 be extended to include matters not covered by the language used. “ ’ ” (*Pacific Legal Foundation v. Brown*, *supra*, 29 Cal.3d at p. 180; see also *California Teacher's Association v. Hayes* (1992) 5 Cal.App.4th 1513, 1529 [7 Cal.Rptr.2d 699] [“Under our form of government, policymaking authority is vested in the Legislature and neither arguments as to the wisdom of an enactment nor questions as to the motivation of the Legislature can serve to invalidate particular legislation.”].) Under these principles, there is no basis for applying section 6 as an equitable remedy to cure the perceived unfairness resulting from political decisions on funding priorities.

(6) One final point merits brief comment. City contends that the Legislative Counsel's determination that section 29550 imposed a state-mandated local program is deserving of some deference. Government Code section 17575 requires the Legislature's Counsel to determine whether a proposed bill mandates a new program or higher level of service pursuant to section 6. Here Legislative Counsel found “[t]his bill would impose a state-mandated local program by authorizing a county to impose a fee upon other local agencies ... for county costs incurred in processing or booking persons arrested by employees of other local agencies ... and brought to county facilities for booking or detention.” (Legis. Counsel's Dig., Sen. Bill No. 2557, 5 Stats. 1990 (Reg. Sess.) Summary Dig., pp. 170-171.) Under Government Code section 17579, when Legislative Counsel makes such a determination, the enacted statute must contain explicit language providing that “if the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with section 17500) of Division 4 of Title 2 of the Government Code....” (Stats. 1990, ch. 466, § 7, p. 2046.)

These findings and required statements are not determinative, however, of the ultimate issue, whether the enactment constitutes a state mandate under section 6. The legislative scheme contained in Government Code section 17500 et seq. makes clear that this issue is to be decided by the Commission. “It is apparent from the comprehensive nature of this legislative scheme, and from the Legislature's expressed intent, that the exclusive remedy for a claimed violation of section 6 lies in these procedures. The statutes create an administrative forum for resolution of state mandate claims, and establish [] procedures which exist for the express purpose of avoiding multiple proceedings, judicial and administrative, addressing the same claim that a reimbursable state mandate has been created.... In short, the Legislature has created what is clearly intended to be a comprehensive and exclusive procedure by which to implement and enforce section 6.’ [Citation.] [¶] Thus *1818 the statutory scheme contemplates that the Commission, as a quasi-judicial body, has the sole and exclusive authority to adjudicate whether a state mandate exists. Thus, any legislative findings are irrelevant to the issue of whether a state mandate exists” (*County of Los Angeles v. Commission on State Mandates*, *supra*, 32 Cal.App.4th at p. 819, quoting from *Kinlaw v. State of California*, *supra*, 54 Cal.3d at p. 333, italics omitted.)

Disposition

We reverse the judgment and direct that the superior court issue an order denying City's petition for a writ of mandate and enter judgment for the State. Costs on appeal are awarded to appellants.

Cottle, P. J., and Mihara, J., concurred.

A petition for a rehearing was denied July 2, 1996, and respondent's petition for review by the Supreme Court was denied September 18, 1996. Mosk, J., was of the opinion that the petition should be granted. *1819

Footnotes

1 We will refer herein to section 6 of article XIII B of the California Constitution simply as section 6.

- 2 In *Lucia Mar* the case was remanded to the Commission for a determination of the remaining issue, whether [Education Code section 59300](#) in fact “mandated” the school districts to make the called for contributions. (*Lucia Mar, supra*, 44 Cal.3d at p. 836.)

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ATTACHMENT 24

59 Cal.App.4th 382, 69 Cal.Rptr.2d 231, 97 Cal. Daily Op. Serv. 8821, 97 Daily Journal D.A.R. 14,255

KATHLEEN CONNELL, as Controller, etc., et al., Petitioners,

v.

THE SUPERIOR COURT OF SACRAMENTO COUNTY, Respondent;
SANTA MARGARITA WATER DISTRICT et al., Real Parties in Interest.

No. C024295.

Court of Appeal, Third District, California.

Nov. 20, 1997.

SUMMARY

Several Water districts brought mandamus proceedings against the State Controller to enforce a State Board of Control decision that a statewide regulatory amendment, which increases the level of purity required when reclaimed wastewater is used for certain types of irrigation, constitutes a state-mandated program for which water districts are entitled to reimbursement from the state. The trial court entered a judgment that the state mandate was a program for which reimbursement was due, and it directed the Controller to determine the amounts of reimbursement. (Superior Court of Sacramento County, Nos. CV347181, CV357155, CV357156 and CV357950, James Timothy Ford, Judge.)

The Court of Appeal ordered issuance of a writ of mandate directing the trial court to vacate its judgment and enter a new judgment denying the petitions for a writ of mandate. The court held that because the judgment plainly left matters undecided, the judgment was interlocutory and therefore was not appealable; however, the court treated the appeal as a writ petition. On the merits, the court held that the public interest exception to the doctrine of administrative collateral estoppel precluded application of the doctrine to the legal issues raised by defendant. The issues presented were not limited to the validity of any finally adjudicated individual claim, but encompassed the question of subvention obligations in general under the regulatory amendment of wastewater purification standards. The court further held that even if the amendment constitutes a new program for state-mandated costs purposes, the costs are not reimbursable, since the water districts have the authority to levy fees to pay for the program ([Wat. Code, § 35470](#)). [Rev. & Tax. Code, former § 2253.2 \(now Gov. Code, § 17556\)](#), provides that the board shall not find a reimbursable cost if the local agency has the “authority,” i.e., the right or power, to levy service charges, fees, or assessments sufficient to pay for the mandated program. The plain language of the statute precludes a construction of “authority” to mean a practical ability in light of surrounding economic circumstances. The court also held that the public interest exception to the doctrine of administrative collateral estoppel permitted the Controller to raise that issue in the trial court. (Opinion by Sims, J., with Puglia, P. J., and Nicholson, J., concurring.)

HEADNOTES

Classified to California Digest of Official Reports

(1a, 1b)

Appellate Review § 17--Decisions Appealable--Final Judgment-- Necessity For Further Orders.

A judgment entered in litigation to determine whether a statewide regulatory amendment, which increases the level of purity required when reclaimed wastewater is used for certain types of irrigation, constitutes a state-mandated program for which water districts are entitled to reimbursement from the state, was not a final judgment and thus was not appealable. The challenging parties' petition sought an order directing the State Controller to issue a warrant and the State Treasurer to pay a warrant, but the judgment merely ordered the Controller to determine amounts without disposing of those matters. The record reflected the trial court's recognition that it could not order issuance or payment

of warrants unless it determined appropriated funds for such expenditures were reasonably available in the state budget, but the necessary evidentiary hearing on that issue was not held. Because the judgment plainly left matters undecided, the judgment was interlocutory and therefore not appealable.

(2)

Appellate Review § 10--Jurisdiction--Appealable Judgment.

An appealable judgment or order is a jurisdictional prerequisite to an appeal.

[See 9 Witkin, Cal. Procedure (4th ed. 1997) Appeal, §§ 13-14.]

(3)

Appellate Review § 17--Decisions Appealable--Interlocutory Judgment.

An interlocutory judgment is not appealable; generally, a judgment is interlocutory if anything further in the nature of judicial action on the part of the trial court is essential to a final determination of the rights of the parties.

(4)

Mandamus and Prohibition § 44--Mandamus--To Courts--Appeal--Scope of Review.

In reviewing a trial court's ruling on a petition for a writ of mandate, the appellate court is ordinarily confined to an inquiry as to whether the findings and judgment of the trial court are supported by substantial evidence. However, where the facts are undisputed and the issues present questions of law, the appellate court is not bound by the trial court's decision but may make its own determination.

(5)

Judgments § 81--Res Judicata--Administrative Collateral Estoppel-- Public Interest Exception--Board of Control Decision.

In litigation by several water districts against the State Controller to enforce a State Board of Control decision that a statewide regulatory amendment, which increases the level of purity required when reclaimed wastewater is used for certain types of irrigation, constitutes a state-mandated program for which water districts are entitled to reimbursement from the state, the public interest exception to the doctrine of administrative collateral estoppel precluded application of the doctrine to the legal issues raised by defendant. The issues presented were not limited to the validity of any finally adjudicated individual claim, but encompassed the question of subvention obligations in general under the regulatory amendment of wastewater purification standards. If the board's decision was wrong but unimpeachable, taxpayers statewide would suffer unjustly the consequences of a continuing obligation to fund the costs of local water districts.

[See 7 Witkin, Cal. Procedure (4th ed. 1997) Judgment, § 339.]

(6a, 6b)

State of California § 11--Fiscal Matters--Reimbursement for State-mandated Costs--Standards for Reclaimed Wastewater--Authority of Water Districts to Levy Fees.

Even if a statewide regulatory amendment, which increases the level of purity required when reclaimed wastewater is used for certain types of irrigation, constitutes a new program for state-mandated costs purposes, the costs are not reimbursable, since the water districts have the authority to levy fees to pay for the program ([Wat. Code, § 35470](#)). [Rev. & Tax. Code, former § 2253.2 \(now Gov. Code, § 17556\)](#), provides that the Board of Control shall not find a reimbursable cost if the local agency has the "authority," i.e., the right or power, to levy service charges, fees, or assessments sufficient

to pay for the mandated program. The plain language of the statute precludes a construction of “authority” to mean a practical ability in light of surrounding economic circumstances.

(7)

Statutes § 29--Construction--Language--Legislative Intent.

In construing statutes, a court's primary task is to determine the lawmakers' intent. To determine intent, the court looks first to the words themselves. If the language is clear and unambiguous there is no need for construction, nor is it necessary to resort to indicia of the intent of the Legislature.

(8)

Judgments § 81--Res Judicata--Administrative Collateral Estoppel-- Public Interest Exception--Legal Issue.

In litigation by several water districts against the State Controller to enforce a State Board of Control decision that a statewide regulatory amendment, which increases the level of purity required when reclaimed wastewater is used for certain types of irrigation, constitutes a state-mandated program for which water districts are entitled to reimbursement from the state, the public interest exception to the doctrine of administrative collateral estoppel permitted defendant to raise the purely legal issue that Rev. & Tax. Code, former § 2253.2 (now [Gov. Code, § 17556](#)), precluded reimbursement. The statute provides that the Board of Control shall not find a reimbursable cost if the local agency has the “authority,” i.e., the right or power, to levy service charges, fees, or assessments sufficient to pay for the mandated program, and plaintiffs have such authority. The board's finding to the contrary was thus not binding.

COUNSEL

Daniel E. Lungren, Attorney General, Floyd D. Shimomura, Assistant Attorney General, Linda A. Cabatic and Susan R. Oie, Deputy Attorneys General, for Petitioners.

No appearance for Respondent.

James A. Curtis for Real Parties in Interest.

SIMS, J.

This case involves a dispute as to whether a statewide regulatory amendment, increasing the level of purity required when reclaimed wastewater is used for certain types of irrigation, constitutes a state-mandated program for which water districts are entitled to reimbursement from the state. ([Cal. Const., art. XIII B, § 6](#) (hereafter, [section 6](#));¹ [Gov. Code, § 17500 et seq.](#); former [Rev. & Tax. Code, § 2201 et seq.](#)) The State Controller and State Treasurer appeal from a trial court judgment granting *386 petitions for writ of mandate brought by Santa Margarita Water District (SMWD), Marin Municipal Water District, Irvine Ranch Water District and Santa Clara Valley Water District (the Districts), seeking to enforce a State Board of Control (the Board) decision which found the regulatory amendment constituted a reimbursable state mandate.² Appellants contend the trial court erred because (1) the amendment did not constitute a new program or higher level of service in an existing program; (2) the Districts' claim was abolished when the statutory basis for their claim-former [Revenue and Taxation Code section 2207](#)-was repealed before their rights were reduced to final judgment, and (3) the Districts' authority to levy fees to pay for the increased costs defeats their claim of a reimbursable mandate. Appellants also challenge the trial court's determination that they were collaterally estopped from challenging the Board's decision (finding a reimbursable state mandate) by their failure timely to seek judicial review of the administrative decision. We shall conclude the Districts' authority to levy fees defeats their claim of a reimbursable mandate, and appellants are not collaterally estopped from raising this matter. We therefore need not address the other contentions. Treating this appeal from a nonappealable judgment as an extraordinary writ petition, we shall direct the trial court to vacate its judgment and enter a new judgment denying the Districts' petitions.

Factual and Procedural Background

In 1975, the State Department of Health Services (DHS) adopted regulations ([Cal. Code Regs., tit. 22, §§ 60301-60357](#)) implementing [Water Code section 13521](#), which provides: “The State Department of Health Services shall establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.” [Section 60313³ of title 22 of the California Code of Regulations](#) prescribed the level of purity required for reclaimed water to be used for landscape irrigation. *387

In May 1976, SMWD adopted a plan to develop a wastewater reclamation system. In August 1976, SMWD filed an application with the responsible regional water quality control board (Water Control Board) for a permit to discharge wastewater from the proposed reclamation system. SMWD also planned to provide reclaimed water for irrigation, potentially to 2,173 acres of land.

In February 1977, the Water Control Board issued SMWD a permit for operation of a reclamation system-the Oso Creek facility. The permit required SMWD to comply with all applicable wastewater reclamation regulations then in effect.

In late 1977, SMWD learned DHS might be considering modifications to the California Code of Regulations, title 22 regulations.

In August 1978, SMWD completed construction of the Oso Creek facility, at a cost of \$17 million.

In September 1978, DHS amended the regulations. The amendment to [California Code of Regulations, title 22, section 60313⁴](#) increased the level of purity required before reclaimed wastewater could be used for the irrigation of parks, playgrounds and school yards. It is this amendment which allegedly constituted a state-mandated cost. SMWD modified its facility to comply with the amended regulations, completing the modifications in 1983. *388

On October 1, 1982, SMWD filed a “test claim”⁵ with the Board, alleging the regulatory amendment relating to the use of reclaimed wastewater constituted a new program or higher level of service. The test claim was made pursuant to former [Revenue and Taxation Code section 2231](#),⁶ which required reimbursement to local agencies for costs mandated by the state (see now [Gov. Code, § 17561⁷](#)), and former [Revenue and Taxation Code section 2207](#), subdivisions (a) and (b)⁸ defining “costs mandated by the state.” (See now [Gov. Code, § 17514⁹](#).) The test claim also cited [section 6](#) (fn. 1, *ante*). *389

On July 28, 1983, the Board determined the amended regulations imposed state mandated costs. In so doing, the Board rejected the position of state agencies seeking denial of the claim on the ground that local agencies are not mandated to use reclaimed water and because, if local agencies do choose to use it, they can recover the cost in charges made to purchasers of the water.

On January 19, 1984, the Board adopted “Parameters and Guidelines” establishing criteria for payment of claims to water districts pursuant to this mandate. (Former [Rev. & Tax. Code, § 2253.2](#); Stats. 1982, ch. 734, § 10, pp. 2916-2917; [Gov. Code, § 17557](#).)

On May 31, 1984, the Board amended its Parameters and Guidelines to provide for reimbursement of SMWD's cost of preparing and presenting the test claim.

In June 1984, the Board, pursuant to former [Revenue and Taxation Code section 2255](#),¹⁰ submitted to the Legislature a statewide cost estimate of \$14 million for this mandate. The Legislature did not appropriate any funds for the mandate in 1984.

In 1985, the Legislature included an appropriation of almost \$14 million for this state-mandated cost in the budget, but the Governor vetoed the appropriation.

In 1986, a bill including \$945,000 for the subject mandate was introduced, but the bill was not enacted.

On January 27, 1987, SMWD filed in the trial court a petition for writ of mandate pursuant to [Code of Civil Procedure section 1085](#). The petition sought an order directing (1) the State Controller to issue a warrant “to pay the State's obligation to SMWD for its 'costs mandated by the state' ” and (2) the State Treasurer to pay the Controller's warrant. *390

At a hearing, the trial court upheld the Board's decision that the amended regulations required a higher level of service and held the doctrines of waiver and collateral estoppel applied to that decision, such that the state, by failing to challenge the Board's decision within the three-year statute of limitations, was barred from challenging it now. However, the trial court did allow the state to argue that the amended regulations did not come within the definition of “program,” as that word had recently been defined in [County of Los Angeles v. State of California \(1987\) 43 Cal.3d 46, 56 \[233 Cal.Rptr. 38, 729 P.2d 202\]](#).

The trial court recognized that, since there was no appropriation for this mandate in the state budget, the court could not grant the relief sought by SMWD (an order directing the Controller to issue a warrant and the Treasurer to pay it) unless the court found the existence of funds reasonably available in the state budget which could be tapped for this purpose. The trial court stated it was not prepared to find the existence of funds reasonably available without a full evidentiary hearing. Rather than use the Board's statewide estimate, the court believed it needed to know the amount to which each water district would be entitled before it could determine whether there were funds reasonably available in the budget. The trial court ruled the exact amount of money to be reimbursed to the Districts had never been determined and referred the matter to a referee to make that determination.

In February 1989, a court-appointed referee began evidentiary hearings to determine the amount of reimbursement for each water district.

In 1989, the Legislature repealed former [Revenue and Taxation Code section 2207](#) (fn. 8, *ante*), defining “costs mandated by the state.” (Stats. 1989, ch. 589, § 7, p. 1978.)

On July 29, 1994, appellants filed in the trial court a motion for judgment on the pleadings/motion to dismiss, arguing repeal of former [Revenue and Taxation Code section 2207](#) destroyed any right to reimbursement and divested the court of jurisdiction to proceed. The motion also revisited the issue presented to and rejected by the Board, that the water districts' authority to levy fees defeated a finding that the costs were reimbursable.

In February 1995, the trial court issued its ruling denying appellants' motion for judgment on the pleadings and for dismissal. The court in its minute order determined repeal of former [Revenue and Taxation Code section 2207](#) in 1989 had not destroyed the Districts' right to reimbursement pursuant to the Board's decision, because the Board's decision was reduced to “final judgment” before the statutory repeal. The court said the Board's *391 decision on July 28, 1983, became final in July 1986, when the applicable three-year statute of limitations for seeking judicial review lapsed. The Board's decision therefore conclusively established the Districts' right to reimbursement, and appellants were collaterally estopped from challenging the Board's decision. The court further said no discernible injustice or public interest precluded this application of collateral estoppel; rather, justice would be furthered by allowing the Districts to enforce their right to reimbursement as established by the Board.

The trial court further said the statutory authority of the Districts to levy service charges and assessments (Former [Rev. & Tax. Code, § 2253.2](#), subd. (b)(4);¹¹ Stats. 1982, ch. 734, § 10, p. 2916; [Gov. Code, § 17556](#)¹²) did not bar

reimbursement for state-mandated costs. “When the Board determined that the 1978 amendment of the regulations establishing reclamation criteria imposed reimbursable state-mandated costs, it rejected the argument of the State Departments of Health Services and Finance that the costs were not reimbursable pursuant to former [Revenue and Taxation Code section 2253\(b\)\(4\)](#) and implicitly determined, in accordance with the presentation of [Santa Margarita Water District] that [the Districts] did not have sufficient authority to levy service charges and assessments to pay for the increased level of service mandated by the 1978 regulatory amendment. This implicit determination, resolving a mixture of legal and factual issues, became final and binding on respondents under the doctrine of collateral estoppel when they failed to seek judicial review of the Board's decision within the three-year limitations period.”

At a further hearing concerning the amount owed to each water district, the trial court stated it had erred in referring the matter to a referee and should have rendered a judgment directing the Controller to determine the amounts owed.

On June 3, 1996, the trial court entered a judgment stating (1) the Board's decision was final at the time the petitions were filed in the trial court; (2) *392 the state mandate is a program for which reimbursement is due under [County of Los Angeles v. State of California, supra](#), 43 Cal.3d 46; (3) the court having concluded it was inappropriate for the court to determine amounts of reimbursement, the Controller was directed to make that determination. The court directed issuance of a writ commanding the Controller to determine the amounts due to the Districts.

Appellants appeal from the judgment.

The Districts filed a cross-appeal, but we dismissed the cross-appeal pursuant to stipulation of the parties.

Discussion

I. Appealability

(1a) Because the petition sought an order directing the Controller to issue a warrant and the Treasurer to pay a warrant but the judgment merely ordered the Controller to determine amounts without disposing of those matters, and because the record reflected the trial court's recognition that it could not order issuance or payment of warrants unless it determined appropriated funds for such expenditures were reasonably available in the state budget¹³ ([Carmel Valley Fire Protection Dist. v. State of California](#) (1987) 190 Cal.App.3d 521, 538-541 [234 Cal.Rptr. 795])-a determination requiring an evidentiary hearing which was not held-we requested supplemental briefing on the question whether the judgment was a final appealable judgment, as opposed to an interlocutory judgment.

(2) An appealable judgment or order is a jurisdictional prerequisite to an appeal. ([Code Civ. Proc., § 904.1](#); 9 Witkin, *Cal. Procedure* (4th ed. 1997) Appeal, §§ 13-14, pp. 72-73.)

(3) An interlocutory judgment is not appealable; generally, a judgment is interlocutory if anything further in the nature of judicial action on the part of the trial court is essential to a final determination of the rights of the parties. ([Lyon v. Goss](#) (1942) 19 Cal.2d 659, 669-670 [123 P.2d 11].)

(1b) In their supplemental briefs, both sides maintain the judgment is a final appealable judgment but for different reasons. Both sides are wrong. *393

Appellants assert the judgment is final because nothing further remains to be done by the trial court. According to appellants, the Controller, after determining what amounts are due, is supposed to submit that amount to the Legislature to appropriate the funds (though the judgment contains no such direction). Appellants assert that, if the Legislature does not appropriate the funds, the Districts' remedy would be to file a new action in the superior court to enforce the court's prior order, and to compel payment out of funds already appropriated and reasonably available for the

expenditures. Appellants assert it is thus premature to consider whether appropriated funds are reasonably available to pay any reimbursement due.

The Districts' supplemental brief, while agreeing the judgment is a final appealable judgment, disputes appellants' view of what happens after the Controller determines the amounts. The Districts maintain the trial court intended for appellants to pay the amounts determined by the Controller, despite the judgment's failure so to state. The Districts claim the unresolved factual question of the existence of available appropriated funds in the budget is merely "an administrative detail" which need not be addressed by the court except in a proceeding to enforce the judgment in the event appellants refuse to pay.

Both sides are wrong. Nothing in the judgment requires the Controller to submit an appropriations bill to the Legislature, and appellants cite no authority that would require such a procedure—which would duplicate steps previously undertaken in this case without success. Nor does anything in the judgment call for issuance or payment of warrants. *Carmel Valley Fire Protection Dist. v. State of California, supra*, 190 Cal.App.3d 521—a case discussed in the trial court and on appeal—recognized that a court violates the separation of powers doctrine if it purports to compel the Legislature to appropriate funds, but no such violation occurs if the court orders payment from an existing appropriation. (*Id.* at pp. 538-539.) Thus, the Districts' view of this matter as an administrative detail for a later postjudgment enforcement proceeding is unsupported.

We recognize this litigation arises from a "test claim," which merely determines whether a state-mandated cost exists. (See fn. 5, *ante.*) Perhaps no issue of payment should arise at all at the test claim stage, though neither side so argues.

In any event, the judgment plainly leaves matters undecided.

We conclude the judgment is interlocutory and therefore not appealable.

Nevertheless, on our own motion, we shall exercise our discretion to treat the appeal as a writ petition and shall grant review on that basis. (*Morehart v. County of Santa Barbara* (1994) 7 Cal.4th 725, 743-744 [29 Cal.Rptr.2d 804, 872 P.2d 143] [treating appeal as writ petition is authorized means for obtaining review of interlocutory judgments].) We shall exercise our discretion to treat the appeal as a writ petition in the interest of justice and judicial economy, because the merits of the dispositive issues have been fully briefed, both sides urge review, and the judgment compels the Controller to engage in complex factfinding determinations which may be moot if the trial court erred on the merits of the mandate issues. Given the difficulties in discerning how the former statutory process of test claims was supposed to work in practice, we believe the interests of justice and judicial economy are best served by reviewing the judgment rather than dismissing the appeal.

We stress, however, that our review is limited to contentions raised in the briefs—which do not raise issues of the propriety of the remedy sought by the Districts. We express no view on whether the remedy sought by the Districts was an available or appropriate remedy.

II. Standard of Review

([4]) In reviewing the trial court's ruling on a writ of mandate, the appellate court is ordinarily confined to an inquiry as to whether the findings and judgment of the trial court are supported by substantial evidence. (*Evans v. Unemployment Ins. Appeals Bd.* (1985) 39 Cal.3d 398, 407 [216 Cal.Rptr. 782, 703 P.2d 122].) However, where the facts are undisputed and the issues present questions of law, the appellate court is not bound by the trial court's decision but may make its own determination. (*Ibid.*)

III. Collateral Estoppel

We first address the trial court's determination that appellants were collaterally estopped from challenging the Board's determination of state-mandated cost (except for the ability to address the effect of a new Supreme Court case defining "program"). The trial court stated the Board's decision became final for collateral estoppel purposes in July 1986, when the statute of limitations for judicial review expired.

Appellants contend the trial court erred in applying collateral estoppel, because there was no "final judgment" for collateral estoppel purposes, since the amount of reimbursement had yet to be determined.

(5) We conclude it is not necessary to decide the parties' dispute as to whether the requirements of administrative collateral estoppel are met, because even assuming the elements are met, the doctrine of collateral estoppel should be disregarded pursuant to the public interest exception. *395

Thus, our Supreme Court declined to apply collateral estoppel in a state-mandated costs case in *City of Sacramento v. State of California* (1990) 50 Cal.3d 51, 64-65 [266 Cal.Rptr. 139, 785 P.2d 522] (*Sacramento II*). There, a city and a county filed claims with the Board seeking subvention of costs imposed by a statute (Stats. 1978, ch. 2, p. 6 et seq., referred to in *Sacramento II* as "chapter 2/78") which extended mandatory coverage under the state unemployment insurance law to include state and local governments. The Board found there was no state-mandated program and denied the claims. On mandamus, the trial court overruled the Board and found the costs reimbursable. We affirmed the trial court in a published opinion. (*City of Sacramento v. State of California* (1984) 156 Cal.App.3d 182 [203 Cal.Rptr. 258] (*Sacramento I*)). On remand, the Board determined the amounts due on the claims, but the Legislature refused to appropriate the necessary funds. The city filed a class action seeking among other things payment of the state-mandated costs. The trial court granted summary judgment for the state on the grounds the statute did not impose state-mandated costs. The Supreme Court upheld the trial court's decision.

The Supreme Court in *Sacramento II* rejected the local agencies' argument that the state was collaterally estopped from relitigating the issue whether a state-mandated cost existed, because *Sacramento I* "finally" decided the matter. (*Sacramento II, supra*, 50 Cal.3d at p. 64.) The Supreme Court said: "Generally, collateral estoppel bars the party to a prior action, or one in privity with him, from relitigating issues finally decided against him in the earlier action. [Citation.] '... But when the issue is a question of law rather than of fact, the prior determination is not conclusive either if injustice would result or if the public interest requires that relitigation not be foreclosed....' [Citation.]

"Even if the formal prerequisites for collateral estoppel are present here, the public-interest exception governs. Whether chapter 2/78 costs are reimbursable under article XIII B and parallel statutes constitutes a pure question of law. The state was the losing party in *Sacramento I*, and also the only entity legally affected by that decision. Thus, strict application of collateral estoppel would foreclose any reexamination of the holding of that case. The state would remain bound, and no other person would have occasion to challenge the precedent.

"Yet the consequences of any error transcend those which would apply to mere private parties. If the result of *Sacramento I* is wrong but unimpeachable, taxpayers statewide will suffer unjustly the consequences of the state's continuing obligation to fund the chapter 2/78 costs of local agencies...." (*Sacramento II, supra*, 50 Cal.3d at p. 64, original italics.) *396

The Supreme Court also rejected the argument that res judicata applied. "Of course, res judicata and the rule of final judgments bar us from disturbing individual claims or causes of action, on behalf of specific agencies, which have been finally adjudicated and are no longer subject to review. [Citations.] However, the issues presented in the current action are not limited to the validity of any such finally adjudicated individual claims. Rather, they encompass the question of defendants' subvention obligations in general under chapter 2/78." (*Sacramento II, supra*, 50 Cal.3d at p. 65, original italics.)

If this court's opinion finding a reimbursable mandate in *Sacramento I* did not constitute a final adjudication precluding further consideration of the matter, a fortiori the Board's decision in the instant case does not constitute a final adjudication precluding further consideration. Thus, here, as in *Sacramento II*, the issues presented are not limited to the validity of any finally adjudicated individual claim, but encompass the question of subvention obligations in general under the regulatory amendment of wastewater purification standards. If the Board's decision is wrong but unimpeachable, taxpayers statewide would suffer unjustly the consequences of a continuing obligation to fund the costs of local water districts. We reject the Districts' argument that no public interest exists in this case because only a few local entities are involved.

The Districts suggest application of the public interest exception to collateral estoppel would nullify the legislative intent to avoid multiple proceedings by creating a comprehensive and exclusive procedure for handling state mandated costs issues in the administrative forum. (E.g., [Gov. Code, § 17500](#).¹⁴) However, we are bound by Supreme Court authority applying the public interest exception in a state-mandated costs case. (*Auto Equity Sales, Inc. v. Superior Court* (1962) 57 Cal.2d 450 *397 [20 Cal.Rptr. 321, 369 P.2d 937].) Moreover, contrary to the Districts' implication, the administrative decision is not the final word; the statutory scheme authorizes judicial review of the administrative decision. ([Gov. Code, § 17559](#); former [Rev. & Tax. Code, § 2253.5](#); Stats. 1977, ch. 1135, § 12, p. 3650.) Additionally, the instant judicial proceeding was initiated by the Districts, not by appellants. Thus, in this case application of the public interest exception to collateral estoppel is not creating multiple proceedings.

In light of the Supreme Court's decision in *Sacramento II*, we disregard earlier authority of an intermediate appellate court which applied administrative collateral estoppel to a question of law in a state-mandated costs case without express discussion of the public interest exception. (*Carmel Valley Fire Protection Dist. v. State of California, supra*, 190 Cal.App.3d at p. 536.)

We conclude that, insofar as appellants' contentions present questions of law, the public interest exception to administrative collateral estoppel governs, and we shall therefore address the legal arguments raised in appellants' brief.

IV. Authority to Levy Fees

([6a]) Appellants contend that, even if the regulatory amendment is a new program for state mandated costs purposes, the Districts' authority to levy fees defeats a determination that the costs are reimbursable. We agree.

At the time SMWD filed its test claim, former [Revenue and Taxation Code section 2253.2](#) provided in part:

“(b) The Board of Control shall not find a reimbursable mandate, pursuant to either Section 2250 of this code or to [Section 905.2 of the Government Code](#), in any claim submitted by a local agency or school district, pursuant to [subdivision \(a\) of Section 2218](#), if, after a hearing, the board finds that:

.....

“(4) The local agency or school district has the authority to levy service charges, fees or assessments sufficient to pay for the mandated program or level of service.”¹⁵ (Stats. 1982, ch. 734, § 10, p. 2917; Stats. 1980, ch. 1256, § 15, pp. 4253-4254.) *398

The same provision is currently contained in [Government Code section 17556](#).¹⁶

The facial constitutionality of this provision was upheld in *County of Fresno v. State of California* (1991) 53 Cal.3d 482 [280 Cal.Rptr. 92, 808 P.2d 235]. The *Fresno* court rejected an argument that the statute was facially unconstitutional as conflicting with [section 6](#) (fn. 1, *ante*), which contains no exclusion of reimbursement where the local agency has authority

to levy fees. [Section 6](#) requires subvention only when the costs in question can be recovered solely from tax revenues. (53 Cal.3d at p. 487.) [Government Code section 17556](#), subdivision (d), “effectively construes the term 'costs' in the constitutional provision as excluding expenses that are recoverable from sources other than taxes. Such a construction is altogether sound.” (*County of Fresno v. State of California, supra*, 53 Cal.3d at p. 487.)

Here, appellants contend that, at all pertinent times, the water districts have had *authority* to levy fees to cover the costs at issue in this case. They cite provisions such as [Water Code section 35470](#), which provides: “Any district formed on or after July 30, 1917, may, in lieu in whole or in part of raising money for district purposes by assessment, make water available to the holders of title to land or the occupants thereon, and may fix and collect charges therefor. The charges may include standby charges to holders of title to land to which water may be made available, whether the water is actually used or not. The charges may vary in different months and in different localities of the district to correspond to the cost and value of the service, and the district may use so much of the proceeds of the charges as may be necessary to defray the ordinary operation or maintenance expenses of the district and for any other lawful district purpose.”

We agree this statute on its face authorizes the Districts to levy fees sufficient to pay the costs involved with the regulatory amendment. We thus shall conclude the Board erred in finding a right to reimbursement despite this authority to levy fees, and we shall conclude appellants are not collaterally estopped from pressing this point.

The Districts do not dispute they have authority to levy fees for the costs involved in this case. Instead they argue the real issue is whether they had *399 “sufficient” authority. They claim this issue was a mixed question of law and fact, and appellants should be collaterally estopped from raising it.¹⁷

We agree with appellants that the public interest exception to collateral estoppel should be applied here, because the issue presents a pure question of law. The Districts tried to make it a factual issue, but we shall explain why the facts presented by the District were immaterial.

Thus, in proceedings before the Board (where [Water Code section 35470](#) was cited to the Board by state agencies), SMWD did not argue it lacked “authority” to levy fees for this purpose. Instead, SMWD argued and presented evidence that it would not be economically desirable to do so. SMWD submitted declarations stating that rates necessary to cover the increased costs would render the reclaimed water unmarketable and would encourage users to switch to potable water. SMWD maintained that imposition of higher fees on users would contravene the legislative policy expressed in [Water Code section 13512](#), which directs the state to undertake all possible steps to encourage development of wastewater reclamation facilities.

The Board made no express finding concerning this issue. The record contains only the Board minutes, which reflect a motion was made “To find a mandate and continue the issue regarding the claimant's ability to levy a service charge, to the parameters and guidelines process.” There was no second to the motion. A motion was then made to find the regulatory amendment contained a reimbursable mandate. The motion carried. The minutes then state: “Discussion: Chairperson Yost disagreed with the motion as she felt the claimant could recover their costs by levying a service charge” The Board's Parameters and Guidelines stated in part: “If service charges or assessments were levied to defray the cost of the new criteria, the claim must be reduced by the amount received from such charges or assessment.”

In proceedings before the trial court, SMWD admitted the district had the authority to levy fees but argued existence of authority was not enough, and the real question was whether it was economically feasible to levy fees sufficient to pay the mandated costs. Thus, SMWD's counsel stated at the hearing in the trial court: “The state keeps focusing on the question of whether the authority to issue, to assess fees and charges exists, and we have never contested that it didn't.

“But the statute which says that the Board cannot find the existence of a mandate if there's authority to assess fees and charges, and then the critical *400 phrase, 'sufficient to pay for the mandated costs,' that's the condition with [*sic*] which they cannot satisfy.

“We proved that, the Board of Control hearing, through economic evidence. We proved it through testimony that the market was absolutely inelastic in terms of reclaimed water and potable water, that if you raise the price of reclaimed water over the potable water, that people would then buy the potable water, and that's all in the record.

“And so we showed that even though we have the authority, it was not sufficient to pay”

We note the record also reflects comments by SMWD's counsel to the trial court, that its customers were paying the increased costs as an “advance” against the state's obligation. The court pointed out users' payment of increased costs disproved the economic evidence SMWD had presented to the Board, that it could not raise its prices without losing its customers. The record also contains indications that the Districts funded the increased costs by diverting money from other sources. As will appear, we need not address this evidence, because it is not relevant to the question of authority to levy fees sufficient to fund the increased costs imposed by the regulatory amendment, which is a question of law in this case.

The trial court's minute order stated the districts' authority to levy fees did not bar reimbursement for state-mandated costs, because the Board “implicitly determined” the districts did not have “sufficient” authority to levy fees to pay for the increased service mandated by the 1978 regulatory amendment, and this “implicit determination, resolving a mixture of legal and factual issues, became final and binding on [appellants] under the doctrine of collateral estoppel when they failed to seek judicial review of the Board's decision within the three-year limitations period.”

On appeal, appellants argue the sole inquiry is whether the local agency has “authority” to levy fees sufficient to pay the costs, and it does not matter whether the local agency, for economic reasons, finds it undesirable to exercise that authority. Appellants argue this presents a question of law, such that the public interest exception to collateral estoppel would apply (assuming the requirements of collateral estoppel are otherwise met).

We agree with appellants. ([7]) In construing statutes, our primary task is to determine the lawmakers' intent. (*Brown v. Kelly Broadcasting Co.* (1989) 48 Cal.3d 711, 724 [257 Cal.Rptr. 708, 771 P.2d 406].) To determine intent, we look first to the words themselves. (*Ibid.*) “If the language is clear *401 and unambiguous there is no need for construction, nor is it necessary to resort to indicia of the intent of the Legislature” (*Lungren v. Deukmejian* (1988) 45 Cal.3d 727, 735 [248 Cal.Rptr. 115, 755 P.2d 299].)

([6b]) Here, the statute is clear and unambiguous. On its face the statute precludes reimbursement where the local agency has “authority” to levy fees sufficient to pay for the mandated program or level of service. The legal meaning of “authority” includes the “Right to exercise powers; ...” (Black's Law Dict. (6th ed. 1990) p. 133, col. 1.) The lay meaning of “authority” includes “the power or right to give commands [or] take action” (Webster's New World Dict. (3d college ed. 1988) p. 92.) Thus, when we commonly ask whether a police officer has the “authority” to arrest a suspect, we want to know whether the officer has the legal sanction to effect the arrest, not whether the arrest can be effected as a practical matter.

Thus, the plain language of the statute precludes reimbursement where the local agency has the authority, i.e., the right or the power, to levy fees sufficient to cover the costs of the state-mandated program.

The Districts in effect ask us to construe “authority,” as used in the statute, as a practical ability in light of surrounding economic circumstances. However, this construction cannot be reconciled with the plain language of the statute and

would create a vague standard not capable of reasonable adjudication. Had the Legislature wanted to adopt the position advanced by the Districts, it would have used “reasonable ability” in the statute rather than “authority.”

The question is whether the Districts have authority, i.e., the right or power, to levy fees sufficient to cover the costs. The Districts clearly have authority to levy fees sufficient to cover the costs at issue in this case. [Water Code section 35470](#) authorizes the levy of fees to “correspond to the cost and value of the service,” and the fees may be used “to defray the ordinary operation or maintenance expenses of the district and for any other lawful district purpose.” The Districts do not demonstrate that anything in [Water Code section 35470](#) limits the authority of the Districts to levy fees “sufficient” to cover their costs.

Thus, the economic evidence presented by SMWD to the Board was irrelevant and injected improper factual questions into the inquiry.

On appeal, the Districts briefly argue economic undesirability of levying fees constitutes a lack of authority to levy fees sufficient to cover costs. They claim the evidence before the Board showed SMWD “could not” *402 increase its fees because it was already charging as much for reclaimed as it was for potable water. However, the cited portion of the record does not show SMWD “could not” increase its fees but only that an increase would render reclaimed water unmarketable and encourage users to switch to potable water. The Districts cite no authority supporting their construction of former [Revenue and Taxation Code section 2253.2](#) (now [Gov. Code, § 17556](#)) that *authority* to levy fees sufficient to cover costs turns on economic feasibility. We have seen the plain language of the statute defeats the Districts' position.

(8) Since the issue in this case presented a question of law, we conclude the public interest exception to collateral estoppel applies. ([Sacramento II, supra, 50 Cal.3d at p. 64.](#))

The Districts argue application of the public interest exception in this case raises policy concerns about the finality of administrative decisions on state-mandated costs, because if collateral estoppel does not apply in this case, it will never apply. However, we merely hold, in accordance with Supreme Court pronouncement, that the public interest exception to collateral estoppel applies under the circumstances of this case to this state-mandated cost issue which presents solely a question of law.

The Districts argue any fees levied by the districts “cannot exceed the cost to the local agency to provide such service,” because such excessive fees would constitute a special tax. However, the districts fail to explain how this is an issue. No one is suggesting the districts levy fees that exceed their costs.

The Districts cite evidence presented to the referee in the aborted hearing to determine amounts owed to each District, that SMWD's director of finance testified SMWD has other sources of revenue from other services it provides (such as sewer service), maintains separate accounts, and borrowed funds internally from other accounts to cover costs incurred as a result of the subject mandate. The Districts assert this testimony reflects that SMWD “recognized the legal limitations on its authority to impose fees for the services that it provides.” However, nothing in this evidence demonstrates any legal limitations on the authority to levy the necessary fees.

The Districts say appellants appear to believe the Districts should require users of other services to subsidize the Districts' cost of reclaiming and selling wastewater, through excessive user fees. However, we do not read appellants' brief as presenting any such argument and in any event do not base our decision on that ground. *403

In a footnote, the Districts make the passing comment: “In light of the adoption of Proposition 218, which added Articles XIII C and XIII D to the California Constitution this past November [1996], the authority of local agencies to recover costs for many services will be impacted by the requirement to secure the approval by majority vote of the property owners voting, to levy or to increase property related fees. See [Section 6, Article XIII D.](#)” The Districts do not contend

that the services at issue in this appeal are among the “many services” impacted by Proposition 218. We therefore have no need to consider what effect, if any, Proposition 218 might have on the issues in this case.

We conclude the Districts were not entitled to reimbursement of state-mandated costs, because they had authority to levy fees sufficient to pay for the level of service mandated by the 1978 regulatory amendment. Appellants were not collaterally estopped from raising this issue in the trial court. We thus conclude the Districts' mandamus petitions should have been denied. We therefore need not address appellants' contentions that (1) the regulatory amendment did not constitute a new program or higher level of service, or (2) any right to reimbursement was abolished upon repeal of former [Revenue and Taxation Code section 2207](#).

Disposition

Let a peremptory writ of mandate issue, directing the trial court to vacate its judgment and enter a new judgment denying the Districts' petitions for writ of mandate. Appellants shall recover their costs on appeal.

Puglia, P. J., and Nicholson, J., concurred.

The petition of real parties in interest for review by the Supreme Court was denied February 25, 1998. *404

Footnotes

- 1 [Section 6](#) provides: “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service, except that the Legislature may, but need not, provide such subvention of funds for the following mandates: [¶] (a) Legislative mandates requested by the local agency affected; [¶] (b) Legislation defining a new crime or changing an existing definition of a crime; or [¶] (c) Legislative mandates enacted prior to January 1, 1975, or executive orders or regulations initially implementing legislation enacted prior to January 1, 1975.”
- 2 The trial court first held proceedings in the matter of the petition filed by the SMWD. The other three water districts had filed petitions, which were consolidated and awaiting hearing. The parties to the consolidated case filed a stipulation indicating they did not wish to relitigate the entitlement issues already decided by Judge Ford in the SMWD case, and they stipulated to assignment of their cases to Judge Ford pursuant to [California Rules of Court, rule 213](#) (assignment to one judge for all or limited purposes), for determination of amounts as to each district. The judgment expressly covers the petitions of all four districts.
- 3 [California Code of Regulations, title 22, section 60313](#), initially provided: “Landscape Irrigation. Reclaimed water used for the irrigation of golf courses, cemeteries, lawns, parks, playgrounds, freeway landscapes, and landscapes in other areas where the public has access shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed.” (Former [§ 60313, Cal. Code Regs., tit. 22](#), Register 75. No. 14 (Apr. 5, 1975).)
- 4 [Section 60313 of California Code of Regulations, title 22](#), as amended, provides: “(a) Reclaimed water used for the irrigation of golf courses, cemeteries, freeway landscapes, and landscapes in other areas where the public has similar access or exposure shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 23 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of coliform organisms does not exceed 240 per 100 milliliters in any two consecutive samples.
“(b) Reclaimed water used for the irrigation of parks, playgrounds, schoolyards, and other areas where the public has similar access or exposure shall be at all times an adequately disinfected, oxidized, coagulated, clarified, filtered wastewater or a wastewater treated by a sequence of unit processes that will assure an equivalent degree of treatment and reliability. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of coliform organisms does not exceed 23 per 100 milliliters in any sample.”

- 5 At the time in question, “test claim” meant “the first claim filed with the State Board of Control alleging that a particular statute or executive order imposes a mandated cost on such local agency or school district.” (Former [Rev. & Tax. Code, § 2218](#); Stats. 1980, ch. 1256, § 7, p. 4249.) “Estimated claims” and “reimbursement claims” were used to make specific demand against an appropriation made for the purpose of paying such claims. (*Ibid.*)
- A similar structure, distinguishing between “test claims” and various “reimbursement claims” or “entitlement claims” continues presently in [Government Code sections 17521-17522](#).
- At the time in question, the statutory procedure provided that if the Board found a mandate, it did not determine the amount to be reimbursed to the test claimant; rather, the Board then adopted a statewide cost estimate which was reported to the Legislature. (Stats. 1980, ch. 1256, p. 4246 et seq.; Stats. 1982, ch. 734, p. 2911 et seq.) It was the State Controller who determined specific amounts to be reimbursed, after the Legislature appropriated funds for that purpose. (*Ibid.*)
- 6 Former [Revenue and Taxation Code section 2231](#) provided in part: “(a) The state shall reimburse each local agency for all 'costs mandated by the state,' as defined in [Section 2207](#)....” (Stats. 1982, ch. 1586, § 3, p. 6264.)
- 7 [Government Code section 17561](#) provides in part: “(a) The state shall reimburse each local agency and school district for all 'costs mandated by the state,' as defined in [Section 17514](#)....”
- 8 Former [Revenue and Taxation Code section 2207](#) provided in part: “ ‘Costs mandated by the state’ means any increased costs which a local agency is required to incur as a result of the following: [¶] (a) Any law enacted after January 1, 1973, which mandates a new program or an increased level of service of an existing program; [¶] (b) Any executive order issued after January 1, 1973, which mandates a new program” (Stats. 1980, ch. 1256, § 4, pp. 4247-4248.)
- The test claim did *not* invoke other subdivisions of former [Revenue and Taxation Code section 2207](#), concerning “(c) Any executive order issued after January 1, 1973, which (i) implements or interprets a state statute and (ii), by such implementation or interpretation, increases program levels above the levels required prior to January 1, 1973. [¶] ... [¶] ... (h) Any statute enacted after January 1, 1973, or executive order issued after January 1, 1973, which adds new requirements to an existing optional program or service and thereby increases the cost of such program or service if the local agencies have no reasonable alternatives other than to continue the optional program.” (Stats. 1980, ch. 1256, § 4, pp. 4247-4248.) Since these subdivisions were not invoked, we have no need to consider them.
- 9 [Government Code section 17514](#) provides: “ ‘Costs mandated by the state’ means any increased costs which a local agency or school district is required to incur after July 1, 1980, as a result of any statute enacted on or after January 1, 1975, or any executive order implementing any statute enacted on or after January 1, 1975, which mandates a new program or higher level of service of an existing program within the meaning of [Section 6](#)”
- 10 Former [Revenue and Taxation Code section 2255](#) provided: “At least twice each calendar year the Board of Control shall report to the Legislature on the number of mandates it has found and the estimated statewide costs of such mandates. Such report shall identify the statewide costs estimated for each such mandate and the reasons for recommending reimbursement.... Immediately on receipt of such report a local governmental claims bill shall be introduced in the Legislature. The local government claims bill, at the time of its introduction, shall provide for an appropriation sufficient to pay the estimated costs of such mandates, pursuant to the provisions of this article.” (Stats. 1980, ch. 1256, § 20, p. 4255.)
- The current provision is contained in [Government Code section 17600](#), which provides: “At least twice each calendar year the commission shall report to the Legislature on the number of mandates it has found pursuant to Article I (commencing with [Section 17550](#)) and the estimated statewide costs of these mandates. This report shall identify the statewide costs estimated for each mandate and the reasons for recommending reimbursement.”
- 11 At the time SMWD filed its test claim, former [Revenue and Taxation Code section 2253.2](#) provided in part: “(b) The Board of Control shall not find a reimbursable mandate ... in any claim submitted by a local agency ... if, after a hearing, the board finds that: [¶] ... [¶] (4) The local agency ... has the authority to levy service charges, fees or assessments sufficient to pay for the mandated program or level of service.” (Stats. 1982, ch. 734, § 10, p. 2916.)
- 12 [Government Code section 17556](#) provides in part: “The [Commission on State Mandates (formerly the Board of Control)] shall not find costs mandated by the state, as defined in [Section 17514](#), in any claim submitted by a local agency or school district, if, after a hearing, the commission finds that: [¶] ... [¶] (d) The local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the mandated program or increased level of service.”
- 13 The petition for writ of mandate alleged there was a continuously appropriated State Mandates Claims Fund upon which the Legislature had placed restrictions which on their face made the fund inapplicable to the mandate at issue in this case. The petition further alleged these restrictions were unconstitutional, such that upon a judicial declaration of their unconstitutionality, there would exist funds reasonably available to pay SMWD. The trial court made no ruling on these matters. In this appeal, we need not and do not decide the propriety of the remedy sought by the Districts.

- 14 [Government Code section 17500](#) provides in part: “The Legislature finds and declares that the existing system for reimbursing local agencies ... for the costs of state-mandated local programs has not provided for the effective determination of the state's responsibilities under [Section 6](#) The Legislature finds and declares that the failure of the existing process to adequately and consistently resolve the complex legal questions involved in the determination of state-mandated costs has led to an increasing reliance by local agencies and school districts on the judiciary and, therefore, in order to relieve unnecessary congestion of the judicial system, it is necessary to create a mechanism which is capable of rendering sound quasi-judicial decisions and providing an effective means of resolving disputes over the existence of state-mandated local programs. [¶] It is the intent of the Legislature in enacting this part to provide for the implementation of [Section 6](#) ... and to consolidate the procedures for reimbursement of statutes specified in the Revenue and Taxation Code with those identified in the Constitution. Further, the Legislature intends that the Commission on State Mandates, as a quasi-judicial body, will act in a deliberative manner in accordance with the requirements of [Section 6](#)”
- 15 This case presents no issue concerning any distinction between “service charges, fees or assessment,” as used in the statute. The parties on appeal frame the issue in terms of the authority to levy “fees.” We adopt their usage for the sake of simplicity.
- 16 [Government Code section 17556](#) provides in part: “The commission [formerly the Board] shall not find costs mandated by the state, as defined in [Section 17514](#), in any claim submitted by a local agency or school district, if, after a hearing, the commission finds that: [¶] ... [¶] (d) The local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the mandated program or increased level of service....”
- 17 The Districts assert appellants are relying on evidence that was not before the Board. However, they do not explain what they mean or give us any reference to appellants' brief. We therefore disregard the assertion.

ATTACHMENT 25



KeyCite Yellow Flag - Negative Treatment

Distinguished by [County of Sonoma v. Commission on State Mandates](#), Cal.App. 1 Dist., November 21, 2000

55 Cal.App.4th 976, 64 Cal.Rptr.2d 270, 97 Cal. Daily Op. Serv. 4510, 97 Daily Journal D.A.R. 7464

REDEVELOPMENT AGENCY OF THE CITY OF SAN MARCOS, Plaintiff and Appellant,

v.

CALIFORNIA COMMISSION ON STATE MANDATES, Defendant and Respondent;

CALIFORNIA DEPARTMENT OF FINANCE, Intervener and Respondent.

No. D026195.

Court of Appeal, Fourth District, Division 1, California.

May 30, 1997.

SUMMARY

The trial court denied a petition for a writ of administrative mandate brought by a city's redevelopment agency that challenged the California Commission on State Mandates' denial of the agency's test claim under [Gov. Code, § 17550](#) et seq. (reimbursement of costs mandated by the state). In its claim, the agency sought a determination that the State of California should reimburse the agency for moneys transferred into its low and moderate-income housing fund pursuant to [Health & Saf. Code, §§ 33334.2](#) and [33334.3](#), of the Community Redevelopment Law. Those statutes require a 20 percent deposit of the particular form of financing received by the agency (tax increment financing generated from its project areas) for purposes of improving the supply of affordable housing. The agency claimed that this tax increment financing should not be subject to state control of the allocations made to various funds and that such control constituted a state-mandated new program or higher level of service for which reimbursement or subvention was required under [Cal. Const., art. XIII B, § 6](#). The trial court found that the source of funds used by the agency was exempt, under [Health & Saf. Code, § 33678](#), from the scope of [Cal. Const., art. XIII B, § 6](#). (Superior Court of San Diego County, No. 686818, Sheridan E. Reed and Herbert B. Hoffman, Judges.)

The Court of Appeal affirmed. It held that under [Health & Saf. Code, § 33678](#), which provides that tax increment financing is not deemed to be the "proceeds of taxes," the source of funds used by the agency was exempt from the scope of [Cal. Const., art. XIII B, § 6](#). Although [Cal. Const., art. XIII B, § 6](#), does not expressly discuss the source of funds used by an agency to fund a program, the historical and contextual context of this provision demonstrates that it applies only to costs recovered solely from tax revenues. Because of the nature of the financing they receive (i.e., tax increment financing), redevelopment agencies are not subject to appropriations limitations or spending caps, they do not expend any proceeds of taxes, and they do not raise general revenues for the local entity. Also, the state is not transferring any program for which it was formerly responsible. Therefore, the purposes of state subvention laws are not furthered by requiring reimbursement when redevelopment agencies are required to allocate their tax increment financing in a particular manner, as in the operation of [Health & Saf. Code, §§ 33334.2](#) and [33334.3](#). (Opinion by Huffman, J., with Work, Acting P. J., and McIntyre, J., concurring.)

HEADNOTES

Classified to California Digest of Official Reports

(1)

State of California § 11--Fiscal Matters--Subvention: Words, Phrases, and Maxims--Subvention.

"Subvention" generally means a grant of financial aid or assistance, or a subsidy.

(2)

State of California § 11--Fiscal Matters--Subvention--Judicial Rules.

Under [Gov. Code, § 17559](#), review by administrative mandamus is the exclusive method of challenging a decision of the California Commission on State Mandates to deny a subvention claim. The determination whether the statutes at issue established a mandate under [Cal. Const., art. XIII B, § 6](#), is a question of law. On appellate review, the following standards apply: [Gov. Code, § 17559](#), governs the proceeding below and requires that the trial court review the decision of the commission under the substantial evidence standard. Where the substantial evidence test is applied by the trial court, the appellate court is generally confined to inquiring whether substantial evidence supports the trial court's findings and judgment. However, the appellate court independently reviews the trial court's legal conclusions about the meaning and effect of constitutional and statutory provisions.

(3a, 3b)

State of California § 11--Fiscal Matters--Subvention--State-mandated Costs--Statutory Set-aside Requirement for Local Redevelopment Agency's Tax Increment Financing.

The California Commission on State Mandates properly denied a test claim brought by a city's redevelopment agency seeking a determination that the state should reimburse the agency for moneys transferred into its low and moderate-income housing fund pursuant to [Health & Saf. Code, §§ 33334.2 and 33334.3](#), which require a 20 percent deposit of the particular form of financing received by the agency, i.e., tax increment financing generated from its project areas. Under [Health & Saf. Code, § 33678](#), which provides that tax increment financing is not deemed to be the "proceeds of taxes," the source of funds used by the agency was exempt from the scope of [Cal. Const., art. XIII B, § 6](#) (subvention). Although [Cal. Const., art. XIII B, § 6](#), does not expressly discuss the source of funds used by an agency to fund a program, the historical and contextual context of this provision demonstrates that it applies only to costs recovered solely from tax revenues. Because of the nature of the financing they receive (i.e., tax increment financing), redevelopment agencies are not subject to appropriations limitations or spending caps, they do not expend any proceeds of taxes, and they do not raise general revenues for the local entity. Also, the state is not transferring any program for which it was formerly responsible. Therefore, the purposes of state subvention laws are not furthered by requiring reimbursement when redevelopment agencies are required to allocate their tax increment financing in a particular manner, as in the operation of [Health & Saf. Code, §§ 33334.2 and 33334.3](#).

[See 9 Witkin, Summary of Cal. Law (9th ed. 1989) Taxation, § 123.]

(4)

Constitutional Law § 10--Construction of Constitutional Provisions-- Limitations on Legislative Powers.

The rules of constitutional interpretation require a strict construction of a constitutional provision that contains limitations and restrictions on legislative powers, because such limitations and restrictions are not to be extended to include matters not covered by the language used.

(5)

State of California § 11--Fiscal Matters--Subvention--Purpose of Constitutional Provisions.

The goal of [Cal. Const., arts. XIII A and XIII B](#), is to protect California residents from excessive taxation and government spending. A central purpose of [Cal. Const., art. XIII B, § 6](#) (reimbursement to local government of state-mandated costs), is to prevent the state's transfer of the cost of government from itself to the local level.

COUNSEL

Higgs, Fletcher & Mack and John Morris for Plaintiff and Appellant.

Gary D. Hori for Defendant and Respondent. *979

Daniel E. Lungren, Attorney General, Robert L. Mukai, Chief Assistant Attorney General, Linda A. Cabatic and Daniel G. Stone, Deputy Attorneys General, for Intervener and Respondent.

HUFFMAN, J.

The California Commission on State Mandates (the Commission) denied a test claim by the Redevelopment Agency of the City of San Marcos (the Agency) (*Gov. Code*, § 17550 et seq.), which sought a determination that the State of California should reimburse the Agency for moneys transferred into its Low and Moderate Income Housing Fund (the Housing Fund) pursuant to *Health and Safety Code*¹ sections 33334.2 and 33334.3. Those sections require a 20 percent deposit of the particular form of financing received by the Agency, tax increment financing generated from its project areas, for purposes of improving the supply of affordable housing. ([1])(*See fn. 2*) The Agency claimed that this tax increment financing should not be subject to state control of the allocations made to various funds and that such control constituted a state-mandated new program or higher level of service for which reimbursement or subvention was required under *article XIII B of the California Constitution, section 6* (hereafter *section 6*; all further references to articles are to the California Constitution).² (*Cal. Const.*, art. XVI, § 16; § 33670.)

The Agency brought a petition for writ of administrative mandamus to challenge the decision of the Commission. (*Code Civ. Proc.*, § 1094.5; *Gov. Code*, § 17559.) The superior court denied the petition, ruling that the source of funds used by the Agency for redevelopment, tax increment financing, was exempt pursuant to *section 33678* from the scope of *section 6*, as not constituting “proceeds of taxes” which are governed by that section. The superior court did not rule upon the alternative grounds of decision stated by the Commission, i.e., the 20 percent set-aside requirement for low and moderate-income housing did not impose a new program or higher level of service in an existing program within the meaning of *section 6*, and, further, there were no costs subject to reimbursement related to the Housing Fund because there was no net increase in the aggregate program responsibilities of the Agency.

The Agency appeals the judgment denying its petition for writ of mandate. For the reasons set forth below, we affirm.
***980**

I. Procedural Context

This test claim was litigated before the Commission pursuant to statutory procedures for determining whether a statute imposes state-mandated costs upon a local agency which must be reimbursed, through a subvention of funds, under *section 6*. (*Gov. Code*, § 17500 et seq.)³ The Commission hearing consisted of oral argument on the points and authorities presented.

([2]) Under *Government Code section 17559*, review by administrative mandamus is the exclusive method of challenging a Commission decision denying a subvention claim. “The determination whether the statutes here at issue established a mandate under *section 6* is a question of law. [Citation.]” (*County of San Diego v. State of California* (1997) 15 Cal.4th 68, 109 [61 Cal.Rptr.2d 134, 931 P.2d 312].) On appellate review, we apply these standards: “*Government Code section 17559* governs the proceeding below and requires that the trial court review the decision of the Commission under the substantial evidence standard. Where the substantial evidence test is applied by the trial court, we are generally confined to inquiring whether substantial evidence supports the court's findings and judgment. [Citation.] However, we independently review the superior court's legal conclusions about the meaning and effect of constitutional and statutory provisions. [Citation.]” (*City of San Jose v. State of California* (1996) 45 Cal.App.4th 1802, 1810 [53 Cal.Rptr.2d 521].)

II. Statutory Schemes

Before we outline the statutory provisions setting up tax increment financing for redevelopment agencies, we first set forth the Supreme Court's recent summary of the history and substance of the law applicable to state mandates, such as the Agency claims exist here: “Through adoption of Proposition 13 in 1978, the voters added *article XIII A* to the California Constitution, which ‘imposes a limit on the power of state and local governments to ***981** adopt and levy taxes. [Citation.] [Citation.] The next year, the voters added *article XIII B* to the Constitution, which ‘impose[s] a

complementary limit on the rate of growth in governmental spending.' [Citation.] These two constitutional articles 'work in tandem, together restricting California governments' power both to levy and to spend for public purposes.' [Citation.] Their goals are 'to protect residents from excessive taxation and government spending. [Citation.]' [Citation.]" (*County of San Diego v. State of California, supra*, 15 Cal.4th at pp. 80-81.)

Section 6, part of article XIII B and the provision here at issue, requires that whenever the Legislature or any state agency mandates a "new program or higher level of service" on any local government, "the state shall provide a subvention of funds to reimburse such local government for *the costs of such program* or increased level of service'" (*County of San Diego v. State of California, supra*, 15 Cal.4th at p. 81, italics added.) Certain exceptions are then stated, none of which is relevant here.⁴

In *County of San Diego v. State of California, supra*, 15 Cal.4th at page 81, the Supreme Court explained that section 6 represents a recognition that together articles XIII A and XIII B severely restrict the taxing and spending powers of local agencies. The purpose of the section is to preclude the state from shifting financial responsibility for governmental functions to local agencies, which are ill equipped to undertake increased financial responsibilities because they are subject to taxing and spending limitations under articles XIII A and XIII B. (*County of San Diego v. State of California, supra*, at p. 81.)

To evaluate the Agency's argument that the provisions of sections 33334.2 and 33334.3, requiring a deposit into the housing fund of 20 percent of the tax increment financing received by the Agency, impose this type of reimbursable governmental program or a higher level of service under an existing program, we first review the provisions establishing financing for redevelopment agencies. Such agencies have no independent powers of taxation (*982 *Huntington Park Redevelopment Agency v. Martin* (1985) 38 Cal.3d 100, 106 [211 Cal.Rptr. 133, 695 P.2d 220]), but receive a portion of tax revenues collected by other local agencies from property within a redevelopment project area, which may result from the following scheme: "Redevelopment agencies finance real property improvements in blighted areas. Pursuant to article XVI, section 16 of the Constitution, these agencies are authorized to use tax increment revenues for redevelopment projects. The constitutional mandate has been implemented through the Community Redevelopment Law (Health & Saf. Code, § 33000 et seq.). [¶] The Community Redevelopment Law authorizes several methods of financing; one is the issuance of tax allocation bonds. Tax increment revenue, the increase in annual property taxes attributable to redevelopment improvements, provides the security for tax allocation bonds. Tax increment revenues are computed as follows: The real property within a redevelopment project area is assessed in the year the redevelopment plan is adopted. Typically, after redevelopment, property values in the project area increase. The taxing agencies (e.g., city, county, school or special district) keep the tax revenues attributable to the original assessed value and pass the portion of the assessed property value which exceeds the original assessment on to the redevelopment agency. (Health & Saf. Code, §§ 33640, 33641, 33670, 33675). In short, tax increment financing permits a redevelopment agency to take advantage of increased property tax revenues in the project areas without an increase in the tax rate. This scheme for redevelopment financing has been a part of the California Constitution since 1952. (Cal. Const., art. XVI, § 16.)" (*Brown v. Community Redevelopment Agency* (1985) 168 Cal.App.3d 1014, 1016-1017 [214 Cal.Rptr. 626].)⁵

In *Brown v. Community Redevelopment Agency, supra*, 168 Cal.App.3d at pages 1016-1018, the court determined that by enacting section 33678, the Legislature interpreted article XIII B of the Constitution as not broad enough in reach to cover the raising or spending of tax increment revenues by redevelopment agencies. Specifically, the court decided the funds a redevelopment agency receives from tax increment financing do not constitute "proceeds of taxes" subject to article XIII B appropriations limits. (*Brown v. Community Redevelopment Agency, supra*, at p. 1019).⁶ This ruling was based on section 33678, providing in pertinent part: "This section implements and fulfills the intent ... of Article XIII B and *983 Section 16 of Article XVI of the California Constitution. *The allocation and payment to an agency of the portion of taxes specified in subdivision (b) of Section 33670 for the purpose of paying principal of, or interest on ... indebtedness incurred for redevelopment activity ... shall not be deemed the receipt by an agency of proceeds of taxes levied*

by or on behalf of the agency within the meaning of or for the purposes of Article XIII B ... nor shall such portion of taxes be deemed receipt of proceeds of taxes by, or an appropriation subject to limitation of, any other public body within the meaning or for purposes of Article XIII B ... or any statutory provision enacted in implementation of Article XIII B. The allocation and payment to an agency of this portion of taxes shall not be deemed the appropriation by a redevelopment agency of proceeds of taxes levied by or on behalf of a redevelopment agency within the meaning or for purposes of Article XIII B of the California Constitution.” (Italics added.)

In *County of Placer v. Corin* (1980) 113 Cal.App.3d 443, 451 [170 Cal.Rptr. 232], the court defined “proceeds of taxes” in this way: “Under article XIII B, with the exception of state subventions, the items that make up the scope of 'proceeds of taxes' concern charges levied to raise *general revenues* for the local entity. 'Proceeds of taxes,' in addition to 'all tax revenues' includes 'proceeds ... from ... regulatory licenses, user charges, and user fees [only] to the extent that such proceeds exceed the costs reasonably borne by such entity in providing the regulation, product or service....' (§ 8, subd. (c).) (Italics added.) Such 'excess' regulatory or user fees are but *taxes* for the raising of general revenue for the entity. [Citations.] Moreover, to the extent that an assessment results in revenue above the cost of the improvement or is of general public benefit, it is no longer a special assessment but a tax. [Citation.] *We conclude 'proceeds of taxes' generally contemplates only those impositions which raise general tax revenues for the entity.*” (Italics added.)⁷

([3a]) In light of these interrelated sections and concepts, our task is to determine whether the 20 percent Housing Fund set-aside requirement of a redevelopment agency's tax increment financing qualifies under section 6 as a “cost” of a program. As will be explained, we agree with the trial court that the resolution of this issue is sufficient to dispose of the entire matter, and *984 accordingly we need not discuss the alternate grounds of decision stated by the Commission.⁸

III. Housing Fund Allocations: Reimbursable Costs?

1. Arguments

The Agency takes the position that the language of section 33678 is simply inapplicable to its claim for subvention of funds required to be deposited into the Housing Fund. It points out that section 6 expressly lists three exceptions to the requirement for subvention of funds to cover the costs of state-mandated programs: (a) Legislative mandates requested by the local agency affected; (b) legislation defining or changing a definition of a crime; or (c) pre-1975 legislative mandates or implementing regulations or orders. (See fn. 4, *ante*.) None of these exceptions refers to the source of the funding originally used by the agency to pay the costs incurred for which reimbursement is now being sought. Thus, the agency argues it is immaterial that under section 33678, *for purposes of appropriations limitations*, tax increment financing is not deemed to be the “proceeds of taxes.” (*Brown v. Community Redevelopment Agency, supra*, 168 Cal.App.3d at pp. 1017-1020.) The Agency would apply a “plain meaning” rule to section 6 (see, e.g., *Davis v. City of Berkeley* (1990) 51 Cal.3d 227, 234 [272 Cal.Rptr. 139, 794 P.2d 897]) and conclude that the source of the funds used to pay the program costs up front, before any subvention, is not stated in the section and thus is not relevant.

As an illustration of its argument that the source of its funds is irrelevant under section 6, the Agency cites to *Government Code section 17556*. That section is a legislative interpretation of section 6, creating several classes of state-mandated programs for which no state reimbursement of local agencies for costs incurred is required. In *County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487 [280 Cal.Rptr. 92, 808 P.2d 235], the Supreme Court upheld the facial constitutionality of *Government Code section 17556*, subdivision (d), which disallows state subvention of funds where the local government is authorized to collect service charges or fees in connection with a mandated program. The court explained that section 6 “was designed to protect the tax revenues of local governments from state mandates that *985 would require expenditure of such revenues.” (*County of Fresno v. State of California, supra*, at p. 487.) Based on the language and history of the measure, the court stated, “Article XIII B of the Constitution, however, was not intended to reach beyond taxation.” (*Ibid.*) The court therefore concluded that in view of its textual and historical context, section 6 “requires subvention only when the costs in question can be recovered *solely from tax revenues.*” (*Ibid.*, original italics.)

Interpreting [section 6](#), the court stated: “Considered within its context, the section effectively construes the term ‘costs’ in the constitutional provision as excluding expenses that are recoverable from sources other than taxes.” (*Ibid.*) No subvention was required where the local authority could recover its expenses through fees or assessments, not taxes.

2. Interpretation of [Section 6](#)

Here, the Agency contends the authority of *County of Fresno v. State of California*, *supra*, 53 Cal.3d 482, should be narrowly read to cover only self-financing programs, and the Supreme Court's broad statements defining “costs” in this context read as mere dicta. It also continues to argue for a “plain meaning” reading of [section 6](#), which it reiterates does not expressly discuss the source of funds used by an agency to pay the costs of a program before any reimbursement is sought. We disagree with both of these arguments. The correct approach is to read [section 6](#) in light of its historical and textual context. (4) The rules of constitutional interpretation require a strict construction of [section 6](#), because constitutional limitations and restrictions on legislative powers are not to be extended to include matters not covered by the language used. (*City of San Jose v. State of California*, *supra*, 45 Cal.App.4th at pp. 1816-1817.)

(5) The goals of articles XIII A and XIII B are to protect California residents from excessive taxation and government spending. (*County of Los Angeles v. State of California*, *supra*, 15 Cal.4th at p. 81.) A central purpose of [section 6](#) is to prevent the state's transfer of the cost of government from itself to the local level. (*City of Sacramento v. State of California*, *supra*, 50 Cal.3d at p. 68.) (3b) The related goals of these enactments require us to read the term “costs” in [section 6](#) in light of the enactment as a whole. The “costs” for which the Agency is seeking reimbursement are its deposits of tax increment financing proceeds into the Housing Fund. Those tax increment financing proceeds are normally received pursuant to the Community Redevelopment Law (§ 33000 et seq.) when, after redevelopment, the taxing agencies collect and keep the tax revenues attributable to the original assessed value and pass on to the redevelopment agency the portion of the *986 assessed property value which exceeds the original assessment. (*Brown v. Community Redevelopment Agency*, *supra*, 168 Cal.App.3d at pp. 1016-1017.) Is this the type of expenditure of tax revenues of local governments, upon state mandates which require use of such revenues, against which [section 6](#) was designed to protect? (*County of Fresno v. State of California*, *supra*, 53 Cal.3d at p. 487.)

3. Relationship of Appropriations Limitations and Subvention

We may find assistance in answering this question by looking to the type of appropriations limitations imposed by article XIII B. In *County of Placer v. Corin*, *supra*, 113 Cal.App.3d at page 447, the court described the discipline imposed by article XIII B in this way: “[A]rticle XIII B does not limit the ability to expend government funds collected from all sources. Rather, the appropriations limit is based on ‘appropriations subject to limitation,’ which consists primarily of the authorization to expend during a fiscal year the ‘proceeds of taxes.’ (§ 8, subd. (a).) As to local governments, limits are placed only on the authorization to expend the proceeds of taxes levied by that entity, in addition to proceeds of state subventions (§ 8, subd. (c)); no limitation is placed on the expenditure of those revenues that do not constitute ‘proceeds of taxes.’”⁹

Because of the nature of the financing they receive, tax increment financing, redevelopment agencies are not subject to this type of appropriations limitations or spending caps; they do not expend any “proceeds of taxes.” Nor do they raise, through tax increment financing, “general revenues for the local entity.” (*County of Placer v. Corin*, *supra*, 113 Cal.App.3d at p. 451, original italics.) The purpose for which state subvention of funds was created, to protect local agencies from having the state transfer its cost of government from itself to the local level, is therefore not brought into play when redevelopment agencies are required to allocate their tax increment financing in a particular manner, as in the operation of [sections 33334.2 and 33334.3](#). (See *City of Sacramento v. State of California*, *supra*, 50 Cal.3d at p. 68.) The state is not transferring to the Agency the operation and administration of a program for which it was formerly legally and financially *987 responsible. (*County of Los Angeles v. Commission on State Mandates* (1995) 32 Cal.App.4th 805, 817 [38 Cal.Rptr.2d 304].)¹⁰

For all these reasons, we conclude the same policies which support exempting tax increment revenues from [article XIII B](#) appropriations limits also support denying reimbursement under [section 6](#) for this particular allocation of those revenues to the Housing Fund. Tax increment financing is not within the scope of [article XIII B](#). (*Brown v. Community Redevelopment Agency*, *supra*, 168 Cal.App.3d at pp. 1016-1020.) [Section 6](#) “requires subvention only when the costs in question can be recovered *solely from tax revenues*.” (*County of Fresno v. State of California*, *supra*, 53 Cal.3d at p. 487, original italics.) No state duty of subvention is triggered where the local agency is not required to expend its proceeds of taxes. Here, these costs of depositing tax increment revenues in the Housing Fund are attributable not directly to tax revenues, but to the benefit received by the Agency from the tax increment financing scheme, which is one step removed from other local agencies' collection of tax revenues. (§ 33000 et seq.) Therefore, in light of the above authorities, this use of tax increment financing is not a reimbursable “cost” under [section 6](#). We therefore need not interpret any remaining portions of [section 6](#).

Disposition

The judgment is affirmed.

Work, Acting P. J., and McIntyre, J., concurred.

Appellant's petition for review by the Supreme Court was denied September 3, 1997.

Footnotes

- 1 All further statutory references are to the Health and Safety Code unless otherwise noted.
- 2 “‘Subvention’ generally means a grant of financial aid or assistance, or a subsidy. [Citation.]” (*Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1564, 1577 [15 Cal.Rptr.2d 547].)
- 3 In our prior opinion issued in this case, we determined the trial court erred when it denied the California Department of Finance (DOF) leave to intervene as an indispensable party and a real party in interest in the mandamus proceeding. (*Redevelopment Agency v. Commission on State Mandates* (1996) 43 Cal.App.4th 1188, 1194-1199 [51 Cal.Rptr.2d 100].) Thus, DOF is now a respondent on this appeal, as is the Commission (sometimes collectively referred to as respondents). However, our decision in that case was a collateral matter and does not assist us on the merits of this proceeding.
- 4 [Section 6](#) lists the following exclusions to the requirement for subvention of funds: “(a) Legislative mandates requested by the local agency affected; [¶] (b) Legislation defining a new crime or changing an existing definition of a crime; or [¶] (c) Legislative mandates enacted prior to January 1, 1975, or executive orders or regulations initially implementing legislation enacted prior to January 1, 1975.” In *City of Sacramento v. State of California* (1990) 50 Cal.3d 51, 69 [266 Cal.Rptr. 139, 785 P.2d 522], the Supreme Court identified these items as exclusions of otherwise reimbursable programs from the scope of [section 6](#). (See also [Gov. Code, § 17514](#), definition of “costs mandated by the state,” using the same “new program or higher level of service” language of [section 6](#).)
- 5 [Section 33071](#) in the Community Redevelopment Law provides that a fundamental purpose of redevelopment is to expand the supply of low and moderate-income housing, as well as expanding employment opportunities and improving the social environment.
- 6 The term of art, “proceeds of taxes,” is defined in [article XIII B, section 8](#), as follows: (c) “‘Proceeds of taxes’ shall include, but not be restricted to, all tax revenues and the proceeds to an entity of government, from (1) regulatory licenses, user charges, and user fees to the extent that those proceeds exceed the costs reasonably borne by that entity in providing the regulation, product, or service, and (2) the investment of tax revenues. With respect to any local government, ‘proceeds of taxes’ shall include subventions received from the state, other than pursuant to [Section 6](#), and, with respect to the state, proceeds of taxes shall exclude such subventions.” (Italics added.)
- 7 The issues before the court in *County of Placer v. Corin*, *supra*, 113 Cal.App.3d 443 were whether special assessments and federal grants should be considered proceeds of taxes; the court held they should not. [Section 6](#) is not discussed; the court's analysis of other concepts found in [article XIII B](#) is nevertheless instructive.

- 8 The alternate grounds of the Commission's decision were that there were no costs subject to reimbursement related to the Housing Fund because there was no net increase in the aggregate program responsibilities of the Agency, and that the set-aside requirement did not constitute a mandated “new program or higher level of service” under this section.
- 9 The term of art, “appropriations subject to limitation,” is defined in [article XIII B, section 8](#), as follows: [¶] (b) “'Appropriations subject to limitation' of an entity of local government means any authorization to expend during a fiscal year *the proceeds of taxes levied by or for that entity* and the proceeds of state subventions to that entity (other than subventions made pursuant to [Section 6](#)) exclusive of refunds of taxes.” (Italics added.)
- 10 We disagree with respondents that the legislative history of [sections 33334.2](#) and [33334.3](#) is of assistance here, specifically, that section 23 of the bill creating these sections provided that no appropriations were made by the act, nor was any obligation for reimbursements of local agencies created for any costs incurred in carrying out the programs created by the act. (Stats. 1976, ch. 1337, § 23, pp. 6070-6071.) As stated in [City of San Jose v. State of California, supra](#), [45 Cal.App.4th at pages 1817-1818](#), legislative findings regarding mandate are irrelevant to the issue to be decided by the Commission, whether a state mandate exists.

ATTACHMENT 26



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64 Cal.App.4th 1190, 75 Cal.Rptr.2d 754, 63 Cal. Comp. Cases
733, 98 Cal. Daily Op. Serv. 4644, 98 Daily Journal D.A.R. 6559

CITY OF RICHMOND, Plaintiff and Appellant,

v.

COMMISSION ON STATE MANDATES, Defendant and Respondent;
DEPARTMENT OF FINANCE, Real Party in Interest and Respondent.

No. C026835.

Court of Appeal, Third District, California.

May 28, 1998.

SUMMARY

A city filed an administrative mandamus action against the Commission on State Mandates, seeking a determination that an amendment to [Lab. Code, § 4707](#), making local safety members of the Public Employees' Retirement System (PERS) eligible for both PERS and workers' compensation death benefits, was a state mandate to which the city was entitled to reimbursement under [Cal. Const., art. XIII B, § 6](#), which applies when a state law establishes a new program or higher level of service payable by local governments. The amendment eliminated local safety members of PERS from the coordination provisions for death benefits payable under workers' compensation and under PERS, whereby survivors of a local safety member of PERS who are killed in the line of duty receive both a death benefit under workers' compensation and a special death benefit under PERS, instead of only the latter. The trial court denied the petition, finding that the amendment created an increased cost but not an increased level of service by local governments. (Superior Court of Sacramento County, No. 96CS03417, James Timothy Ford, Judge.)

The Court of Appeal affirmed. The court held that although the amendment increased the cost of providing services, that could not be equated with requiring an increased level of service, and did not constitute a new program. Neither did the amendment impose a unique requirement on local governments that was not applicable to all residents and entities within the state. The amendment merely made the workers' compensation death benefit requirements as applicable to local governments as they are to private employers. Local entities are not entitled to reimbursement for all increased costs mandated by state law, but only those costs resulting from a new program or an increased level of service imposed upon them by the state. Although a law is addressed only to local governments and imposes new costs on them, it may still not be a reimbursable state mandate. The court also held that assembly bill analyses stating that the amendment was a reimbursable state mandate ([Cal. Const., art. XIII B, § 6](#)), were irrelevant to the issue. The Legislature has entrusted the determination of what constitutes a state mandate to the Commission on State Mandates, subject to judicial review, and has provided that the initial determination by Legislative Counsel is not binding on the commission. (Opinion by Morrison, J., with Puglia, P. J., and Nicholson, J., concurring.)

HEADNOTES

Classified to California Digest of Official Reports

(1)

Administrative Law § 138--Judicial Review and Relief--Appellate Court-- Standard--Decision of Commission on State Mandates.

Under [Gov. Code, § 17559](#), a proceeding to set aside a decision of the Commission on State Mandates on a claim may be commenced on the ground that the commission's decision was not supported by substantial evidence. Where the scope of review in the trial court is whether the administrative decision is supported by substantial evidence, review on appeal is generally the same. However, the appellate court independently reviews the superior court's legal conclusions as to the meaning and effect of constitutional and statutory provisions. The question of whether a law is a state-mandated program or a higher level of service under [Cal. Const., art. XIII B, § 6](#), is a question of law that is reviewed de novo.

(2a, 2b, 2c)

State of California § 11--Fiscal Matters--Reimbursement for State Mandates--Workers' Compensation Death Benefits Payable to Local Safety Members.

An amendment to [Lab. Code, § 4707](#), to eliminate local safety members of the Public Employees' Retirement System (PERS) from the coordination provisions for death benefits payable under workers' compensation and under PERS, whereby the survivors of a local safety member of PERS who is killed in the line of duty receive both a death benefit under workers' compensation and a special death benefit under PERS, instead of only the latter, did not mandate a new program or higher level of service on local governments, requiring a subvention of funds to reimburse the local government under [Cal. Const., art. XIII B, § 6](#). Although the amendment increased the cost of providing services, that could not be equated with requiring an increased level of service, and did not constitute a new program. Neither did it impose a unique requirement on local governments that was not applicable to all residents and entities within the state. The amendment merely made the workers' compensation death benefit requirements as applicable to local governments as they are to private employers.

(3a, 3b)

State of California § 11--Fiscal Matters--Reimbursement for State Mandates--Purpose.

[Cal. Const., art. XIII B, § 6](#), which requires a subvention of funds to reimburse local governments when a state law mandates a new program or higher level of service on local governments, was intended to require reimbursement to local agencies for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. Although a law is addressed only to local governments and imposes new costs on them, it may still not be a reimbursable state mandate.

[See 9 Witkin, Summary of Cal. Law (9th ed. 1989) Taxation, § 123A.]

(4)

Statutes § 43--Construction--Aids--Legislative Analysis--Reimbursement for State Mandates--Legislative Intent.

Assembly bill analyses of an amendment to [Lab. Code, § 4707](#), making local safety members of the Public Employees' Retirement System (PERS) eligible for both PERS and workers' compensation death benefits, stating that it was a reimbursable state mandate ([Cal. Const., art. XIII B, § 6](#)), were irrelevant to the issue. The Legislature has entrusted the determination of what constitutes a state mandate to the Commission on State Mandates, subject to judicial review ([Gov. Code, §§ 17500, 17559](#)) and has provided that the initial determination by legislative counsel is not binding on the commission ([Gov. Code, § 17575](#)).

COUNSEL

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Gary D. Hori and Shawn D. Silva for Defendant and Respondent.

Daniel E. Lungren, Attorney General, Linda A. Cabatic, Assistant Attorney General, Marsha Bedwell and Shelleyanne W. L. Chang, Deputy Attorneys General, for Real Party in Interest and Respondent. *1193

MORRISON, J.

Chapter 478 of the Statutes of 1989 (chapter 478) amended [Labor Code section 4707](#) to eliminate local safety members of the Public Employees' Retirement System (PERS) from the coordination provisions for death benefits payable under workers' compensation and under PERS. As a result, the survivors of a local safety member of PERS who is killed in the line of duty receives both a death benefit under workers' compensation and a special death benefit under PERS, instead of only the latter. This proceeding presents the question whether chapter 478 mandates a new program or higher level of service on local governments, requiring a subvention of funds to reimburse the local government under [article XIII B section 6 of the California Constitution](#). We conclude that chapter 478 is not a state mandate requiring reimbursement and affirm the judgment.

Factual and Procedural Background

The workers' compensation system provides for death benefits payable to the deceased employee's survivors. ([Lab. Code, § 4700](#) et seq.) There are also preretirement death benefits under PERS. ([Gov. Code, § 21530](#) et seq.) There is a special death benefit under PERS if the death was industrial and the deceased was a patrol, state peace officer/firefighter, state safety officer, state industrial, or local safety member. ([Gov. Code, § 21537](#).) [Labor Code section 4707](#) provides a coordination or offset for workers' compensation death benefits when the special death benefit under PERS is payable. In such cases, no workers' compensation death benefit, other than burial expenses, is payable, except that if the PERS special death benefit is less than the workers' compensation death benefit, the difference is paid as a workers' compensation death benefit. The total death benefit is equal to the greater of the PERS special death benefit or the workers' compensation benefit, not the combination of the two death benefits.

Prior to 1989, [Labor Code section 4707](#) provided in part: "No benefits, except reasonable expenses of burial ... shall be awarded under this division on account of the death of an employee who is a member of the Public Employees' Retirement System unless it shall be determined that a special death benefit ... will not be paid by the Public Employees' Retirement System to the widow or children under 18 years of age, of the deceased, on account of said death, but if the total death allowance paid to said widow and children shall be less than the benefit otherwise payable under this division such widow and children shall be entitled, under this division, to the difference." (Stats. 1977, ch. 468, § 4, pp. 1528-1529.) *1194

Chapter 478 amended [Labor Code section 4707](#) to make technical changes, to provide the death benefit is payable to the surviving spouse rather than to the widow, and to add subdivision (b). Subdivision (b) of [Labor Code section 4707](#) reads: "The limitation prescribed by subdivision (a) shall not apply to local safety members of the Public Employees' Retirement System." (Stats. 1989, ch. 478, § 1, p. 1689.)

In 1992, David Haynes, a police officer for the City of Richmond (Richmond), was killed in the line of duty. Officer Haynes was a local safety member of PERS. His wife and children received the PERS special death benefit; they also received a death benefit under workers' compensation.

Richmond filed a test claim with the Commission on State Mandates (the Commission), contending chapter 478 created a state-mandated local cost.¹ Richmond sought reimbursement of the cost of the workers' compensation death benefit, estimated to be \$295,432. As part of its test claim, Richmond included legislative history of chapter 478, purporting to show a legislative intent to create a reimbursable state mandate.

The Commission denied the test claim. It found that chapter 478 dealt with workers' compensation benefits and case law held that workers' compensation laws are laws of general application and not subject to [section 6 of article XIII B](#)

of the California Constitution. It noted the legislative history containing analyses that chapter 478 was a state mandate had been prepared before the issuance of *City of Sacramento v. State of California* (1990) 50 Cal.3d 51 [266 Cal.Rptr. 139, 785 P.2d 522].

Richmond filed a petition for a writ of administrative mandate under Code of Civil Procedure section 1094.5, seeking to compel the Commission to approve its claim. Both the Commission and the Department of Finance, as real parties in interest, responded. The court denied the petition, finding chapter 478 created an increased cost but not an increased level of service by local governments.

Discussion

I

(1) Under Government Code section 17559, a proceeding to set aside the Commission's decision on a claim may be commenced on the ground that the Commission's decision is not supported by substantial evidence. Where *1195 the scope of review in the trial court is whether the administrative decision is supported by substantial evidence, our review on appeal is generally the same. (*County of Los Angeles v. Commission on State Mandates* (1995) 32 Cal.App.4th 805, 814 [38 Cal.Rptr.2d 304].) However, we independently review the superior court's legal conclusions as to the meaning and effect of constitutional and statutory provisions. (*City of San Jose v. State of California* (1996) 45 Cal.App.4th 1802, 1810 [53 Cal.Rptr.2d 521].) The question of whether chapter 478 is a state-mandated program or higher level of service under article XIII B, section 6 of the California Constitution is a question of law we review de novo. (45 Cal.App.4th at p. 1810.)

With certain exceptions not relevant here, "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service" (Cal. Const. art. XIII B, § 6, (hereafter referred to as section 6).)

In *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46 [233 Cal.Rptr. 38, 729 P.2d 202], the Supreme Court considered whether laws increasing the amount employers, including local governments, had to pay in certain workers' compensation benefits were a reimbursable "higher level of service" under section 6. The court looked to the intent of the voters in adopting the constitutional provision by initiative. (43 Cal.3d at p. 56.) Noting that the phrase "higher level of service" is meaningless alone, the court found it must be read in conjunction with the phrase "new program." The court concluded, "that the drafters and the electorate had in mind the commonly understood meanings of the term—programs that carry out the governmental function of providing services to the public, or laws which, to implement a state policy, impose unique requirements on local governments and do not apply generally to all residents and entities in the state." (*Ibid.*)

(2a) Richmond contends chapter 478 meets both tests to qualify as a program under section 6. Richmond contends increased death benefits are provided to generate a higher quality of local safety officers and thus provide the public with a higher level of service. Richmond argues that providing increased death benefits to local safety workers is analogous to providing protective clothing and equipment for fire fighters. In *Carmel Valley Fire Protection Dist. v. State of California* (1987) 190 Cal.App.3d 521 [234 Cal.Rptr. 795], executive orders requiring updated protective clothing and equipment for firefighters were found to be reimbursable state mandates under section 6. The executive orders applied only to fire protection, a peculiarly governmental function. The court noted that police and fire *1196 protection are two of the most essential and basic functions of local government. (190 Cal.App.3d at p. 537.) Richmond urges that since chapter 478 applies only to local safety members, it is also a state mandate directed to a peculiarly local governmental function.

In *Carmel Valley Fire Protection Dist. v. State of California*, *supra*, 190 Cal.App.3d 521, the executive order required updated equipment for the fighting of fires. The use of this equipment would result in more effective fire protection and thus would provide a higher level of service to the public. Here chapter 478 addresses death benefits, not the equipment

used by local safety members. Increasing the cost of providing services cannot be equated with requiring an increased level of service under a [section 6](#) analysis. A higher cost to the local government for compensating its employees is not the same as a higher cost of providing services to the public. (*City of Anaheim v. State of California* (1987) 189 Cal.App.3d 1478, 1484 [235 Cal.Rptr. 101] [temporary increase in PERS benefit to retired employees which resulted in higher contribution rate by local government was not a program or service under [section 6](#)].) In *County of Los Angeles v. State of California*, *supra*, 43 Cal.3d 46, the increase in certain workers' compensation benefits resulted in an increase in the cost to local governments of providing services. Nonetheless, the Supreme Court found no "higher level of service" under [section 6](#). Similarly, a new requirement for mandatory unemployment insurance for local government employees, an increase in the cost of providing services, was not a "new program" or "higher level of service" in *City of Sacramento v. State of California*, *supra*, 50 Cal.3d 51, 66-70. Chapter 478 fails to meet the first test of a "program" under [section 6](#).

Richmond urges chapter 478 meets the second test of a program under [section 6](#) because it imposed a unique requirement on local governments that was not applicable to all residents and entities within the state. (*County of Los Angeles v. State of California*, *supra*, 43 Cal.3d 46, 56.) Richmond argues that only local governments have "local safety members" and chapter 478 required double death benefits, both PERS and workers' compensation, for this specific group of employees. By requiring double death benefits for local safety members, chapter 478 imposed a unique requirement on local government.

The Commission takes a different view of chapter 478. First, it argues that chapter 478 addresses an aspect of workers' compensation law, which, under *County of Los Angeles v. State of California*, *supra*, 43 Cal.3d 46, is a law of general application to which [section 6](#) does not apply. The Commission argues chapter 478 imposes no unique requirement; it merely *1197 eliminates the previous exemption from providing workers' compensation death benefits to local safety members. As such, chapter 478 simply puts local government employers on the same footing as all other nonexempt employers, requiring that they provide the workers' compensation death benefit. That chapter 478 affects only local government does not compel the conclusion that it imposes a unique requirement on local government. The Commission contends Richmond's view of chapter 478 is too narrow; the law must be considered in its broader context.

While Richmond's argument has surface appeal, we conclude the Commission's view is the correct one. [Section 6](#) was designed to prevent the state from forcing programs on local government. ([3a]) "[T]he intent underlying [section 6](#) was to require reimbursement to local agencies for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. Laws of general application are not passed by the Legislature to 'force' programs on localities." (*County of Los Angeles v. State of California*, *supra*, 43 Cal.3d at pp. 56-57.) "The goals of [article XIII B](#), of which [section 6](#) is a part, were to protect residents from excessive taxation and government spending. [Citation.] [Section 6](#) had the additional purpose of precluding a shift of financial responsibility for carrying out governmental functions from the state to local agencies which had had their taxing powers restricted by the enactment of [article XIII A](#) in the preceding year and were ill equipped to take responsibility for any new programs. Neither of these goals is frustrated by requiring local agencies to provide the same protections to their employees as do private employers. Bearing the costs of salaries, unemployment insurance, and workers' compensation coverage-costs which all employers must bear-neither threatens excessive taxation or governmental spending, nor shifts from the state to a local agency the expense of providing governmental services." (*Id.* at p. 61.)

Although a law is addressed only to local governments and imposes new costs on them, it may still not be a reimbursable state mandate. In *City of Sacramento v. State of California*, *supra*, 50 Cal.3d 51, the Legislature enacted a statute requiring local governments to participate in the state's unemployment insurance system on behalf of their employees. Local entities made a claim for reimbursement. First, the Supreme Court found that like an increase in workers' compensation benefits, a requirement to provide unemployment insurance did not compel new or increased "service to the public" at the local level. (*Id.* at pp. 66-67.) The court next addressed whether the new law imposed a unique requirement on local governments.

“Here, the issue is whether costs *unrelated* to the provision of public services are *nonetheless* reimbursable costs of government, because they are *1198 imposed on local governments 'unique[ly],' and not merely as an incident of compliance with general laws. State and local governments, and nonprofit corporations, had previously enjoyed a special *exemption* from requirements imposed on most other employers in the state and nation. Chapter 2/78 merely eliminated the exemption and made these previously exempted entities subject to the general rule. By doing so, it may have imposed a requirement 'new' to local agencies, but that requirement was not 'unique.' [¶] The distinction proposed by plaintiffs would have an anomalous result. The state could avoid subvention under *County of Los Angeles* standards by imposing new obligations on the public and private sectors *at the same time*. However, if it chose to proceed by stages, extending such obligations first to private entities, and only later to local governments, it would have to pay. This was not the intent of our recent decision.” (*City of Sacramento v. State of California, supra*, 50 Cal.3d 51, 68-69, italics in original.)

Richmond argues that [Labor Code section 4707](#), prior to chapter 478, was not an exemption from workers' compensation, relying on *Jones v. Kaiser Industries Corp.* (1987) 43 Cal.3d 552 [237 Cal.Rptr. 568, 737 P.2d 771]. In *Jones*, the plaintiff, a city police officer, was killed in a traffic accident while on duty. His survivors brought suit against the city, contending it has created and maintained a dangerous condition at the intersection where the accident occurred. Plaintiffs argued their suit was not barred by the exclusivity provisions of workers' compensation because they did not receive a workers' compensation death benefit under [Labor Code section 4707](#). The court rejected this argument. First, plaintiffs did receive a benefit under workers' compensation in the form of burial expenses. Further, [Labor Code section 4707](#) was designed not to exclude plaintiffs from receiving workers' compensation benefits, but to assure they received the maximum benefit under either PERS or workers' compensation. (43 Cal.3d at p. 558.)

Under *Jones v. Kaiser Industries Corp., supra*, 43 Cal.3d 552, one receiving a special death benefit under PERS rather than the workers' compensation death benefit is not considered exempt from workers' compensation for purposes of its exclusivity provisions, precluding a suit against the employer for negligence. This conclusion does not affect the analysis that chapter 478, by removing the offset provisions for employers of local safety members, merely makes local governments “indistinguishable in this respect from private employers.” (*County of Los Angeles v. State of California, supra*, 43 Cal.3d at p. 58.)

([2b]) Richmond's error is in viewing chapter 478 from the perspective of what the final result is, rather than from the perspective of what the law mandates. ([3b]) “We recognize that, as is made indisputably clear from *1199 the language of the constitutional provision, local entities are not entitled to reimbursement for all increased costs mandated by state law, but only those costs resulting from a new program or an increased level of service imposed upon them by the state.” (*Lucia Mar Unified School Dist. v. Honig* (1988) 44 Cal.3d 830, 835 [244 Cal.Rptr. 677, 750 P.2d 318].) ([2c]) While the result of chapter 478 is that local safety members of PERS now are eligible for two death benefits and local governments will have to fund the workers' compensation benefit, chapter 478 does not mandate double death benefits. Instead, it merely eliminates the offset provisions of [Labor Code section 4707](#). In this regard, the law makes the workers' compensation death benefit requirements as applicable to local governments as they are to private employers. It imposes no “unique requirement” on local governments.

Further, the view that the Legislature was proceeding by stages in enacting chapter 478 finds support in the history of the nearly identical predecessor to chapter 478, Assembly Bill No. 1097 (1987-1988 Reg. Sess.). Assembly Bill No. 1097 was passed in 1988, but was vetoed by the Governor. While the final version of Assembly Bill No. 1097 was virtually identical to chapter 478 in adding subdivision (b) to [Labor Code section 4707](#) (Assem. Bill No. 1097 (1987-1988 Reg. Sess.) as amended Mar. 22, 1988), the bill was very different when it began. The initial version of Assembly Bill No. 1097 repealed [Labor Code section 4707](#) in its entirety. (Assem. Bill No. 1097 (1987-1988 Reg. Sess.) introduced Mar. 2, 1987.) The next version made [Labor Code section 4707](#) applicable only to state members of PERS. (Assem. Bill No. 1097 (1987-1988 Reg. Sess.) as amended June 15, 1987.) The final version left [Labor Code section 4707](#) applicable to all but local safety members of PERS.

II

(4) As part of its test claim, Richmond included portions of the legislative history of chapter 478 to show the Legislature intended to create a state mandate. This history includes numerous bill analyses by legislative committees that state the bill creates a state-mandated local program.

[Government Code section 17575](#) requires the Legislative Counsel to determine if a bill mandates a new program or higher level of service under [section 6](#). If the Legislative Counsel determines the bill will mandate a new program or higher level of service under [section 6](#), the bill must contain a section specifying that reimbursement shall be made from the state mandate fund, that there is no mandate, or that the mandate is being disclaimed. ([Gov. Code, § 17579](#).) The Legislative Counsel found that chapter 478 imposed ***1200** a state-mandated local program. The enacted statute provided: “Notwithstanding [Section 17610 of the Government Code](#), if the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with [Section 17500](#)) of Division 4 of Title 2 of the Government Code. If the statewide cost of the claim for reimbursement does not exceed one million dollars (\$1,000,000), reimbursement shall be made from the State Mandates Claims Fund.” (Stats. 1989, ch. 478, § 2, p. 1689.)

One analysis concluded this language was technically deficient because it does not contain a specific acknowledgment that the bill is a state mandate. Reimbursement could not be made until the Commission held a hearing on a test claim. The analysis concluded it “should not be a serious problem because the information provided in this analysis could also be provided to the Commission on State Mandates if any local agency submits a claim for reimbursement to that Commission.”

Another analysis suggested including an appropriation to avoid the necessity of the Commission having to determine that the bill was a mandate.

Richmond argues this legislative history shows the Legislature intended chapter 478 to be a state mandate and that it should be considered in making that determination. Amici curiae submitted a brief urging that case law holding that legislative history is irrelevant to the issue of whether there is a state-mandated new program or higher level of service under [section 6](#) is wrongly decided.² Amici curiae argue that the intent of the Legislature should control. They further note that the legislative history of chapter 478 shows that the initial opposition of the League of California Cities was dropped after the bill was amended to ensure reimbursement, and that the Governor signed the bill after he had vetoed a similar one that was not considered a state mandate. Amici curiae argue that to ignore the widespread understanding that the bill created a state mandate would undermine the legislative process.

In *County of Los Angeles v. Commission on State Mandates*, *supra*, [32 Cal.App.4th 805](#), plaintiff sought reimbursement for costs incurred under [Penal Code section 987.9](#) for providing certain services to indigent criminal defendants. Plaintiff argued the Legislature’s initial appropriation of funds to cover the costs incurred under [Penal Code section 987.9](#) was a final and ***1201** unchallengeable determination that [section 987.9](#) constituted a state mandate. The court rejected this argument. “The findings of the Legislature as to whether [section 987.9](#) constitutes a state mandate are irrelevant.” ([32 Cal.App.4th at p. 818](#).)

The court, relying on *Kinlaw v. State of California* (1991) 54 Cal.3d 326 [285 Cal.Rptr. 66, 814 P.2d 1308], found the Legislature had created a comprehensive and exclusive procedure for implementing and enforcing [section 6](#). (*County of Los Angeles v. Commission on State Mandates*, *supra*, [32 Cal.App.4th at pp. 818-819](#).) This procedure is set forth in [Government Code section 17500](#) et seq. “[T]he statutory scheme contemplates that the Commission, as a quasi-judicial body, has the sole and exclusive authority to adjudicate whether a state mandate exists. Thus, any legislative findings are

irrelevant to the issue of whether a state mandate exists, and the Commission properly determined that no state mandate existed.” (32 Cal.App.4th at p. 819.)

In *City of San Jose v. State of California*, *supra*, 45 Cal.App.4th 1802, 1817-1818, the court relied upon *County of Los Angeles v. Commission on State Mandates*, *supra*, 32 Cal.App.4th 805, in rejecting the argument that the determination by Legislative Counsel that a bill imposed a state mandate was entitled to deference.

Amici curiae contend these cases are wrong because they ignore the cardinal rules of statutory construction that courts must construe statutes to conform to the purpose and intent of lawmakers and that the intent of the Legislature should be ascertained to effectuate the purpose of the law.

Amici curiae are correct that “ 'the objective of statutory interpretation is to ascertain and effectuate legislative intent.' [Citation.]” (*Trope v. Katz* (1995) 11 Cal.4th 274, 280 [45 Cal.Rptr.2d 241, 902 P.2d 259].) Where such intent is not clear from the language of the statute, we may resort to extrinsic aids, including legislative history. (*People v. Coronado* (1995) 12 Cal.4th 145, 151 [48 Cal.Rptr.2d 77, 906 P.2d 1232].) Here, however, the issue is not the interpretation of Labor Code section 4707. The parties agree it requires that the survivors of local safety members killed due to an industrial injury receive both the special death benefit under PERS and the workers' compensation death benefit. Rather, the issue is whether section 6 requires reimbursement for the costs incurred by local governments under chapter 478. The Legislature has entrusted that determination to the Commission, subject to judicial review. (Gov. Code, §§ 17500, 17559.) It has provided that the initial determination by Legislative Counsel is not binding on the Commission. (*Id.*, § 17575.) Indeed, the language of chapter 478 recognizes that the determination of whether the bill is a state mandate lies with *1202 the Commission. It reads, “if the Commission on State Mandates determines that this act contains costs mandated by the state, ...” (Stats. 1989, ch. 478, § 2, p. 1689, italics added.) While the legislative history of chapter 478 may evince the understanding or belief of the Legislature that chapter 478 created a state mandate, such understanding or belief is irrelevant to the issue of whether a state mandate exists. (*County of Los Angeles v. Commission on State Mandates*, *supra*, 32 Cal.App.4th 805, 819.)

Disposition

The judgment is affirmed.

Puglia, P. J., and Nicholson, J., concurred.

Appellant's petition for review by the Supreme Court was denied August 19, 1998. *1203

Footnotes

- 1 ” 'Test claim' means the first claim filed with the commission alleging that a particular statute or executive order imposes costs mandated by the state.” (Gov. Code, § 17521.)
- 2 The California State Association of Counties, and the Cities of Carlsbad, Cudahy, Montebello, Monterey, Redlands, San Luis Obispo and San Pablo filed an amici curiae brief in support of Richmond.

ATTACHMENT 27

84 Cal.App.4th 1264, 101 Cal.Rptr.2d 784, 149 Ed. Law Rep. 207, 00 Cal. Daily Op. Serv. 9518, 00 Cal. Daily Op. Serv. 9263, 2000 Daily Journal D.A.R. 12,423

COUNTY OF SONOMA, Plaintiff and Respondent,

v.

COMMISSION ON STATE MANDATES, Defendant and Respondent;
DEPARTMENT OF FINANCE et al., Real Parties in Interest and Appellants;
COUNTY OF AMADOR et al., Interveners and Respondents.

No. A089524

Court of Appeal, First District, Division 1, California.

Nov. 21, 2000.

SUMMARY

The Legislature, in response to a budget crisis in 1992, reduced property taxes previously allocated to local governments and simultaneously placed an equal amount of property tax revenues into Educational Revenue Augmentation Funds (ERAF's) for distribution to school districts (Rev. & Tax. Code, former § 97.03, now [Rev. & Tax. Code, §§ 97.2 & 97.3](#); [Ed. Code, § 41204.5](#)). Sonoma County and 47 other counties filed a test claim with the Commission on State Mandates, pursuant to [Cal. Const., art. XIII B, § 6](#) (part of Prop. 4 pertaining to reimbursement of local governments for state-mandated new program or higher level of service), asserting that they had been subjected to a new program or an increased level of service for which subvention was required. The commission rejected the claim. Sonoma County challenged the commission's decision by filing a petition for a writ of administrative mandate and a complaint for declaratory relief, and the trial court found that the ERAF legislation created a new program or higher level of service that required reimbursement. (Superior Court of Sonoma County, No. SCV221243, Laurence K. Sawyer, Judge.)

The Court of Appeal reversed the trial court's judgment and remanded with instructions to enter a new judgment denying the writ petition. The court held that the ERAF legislation did not amount to the imposition of a state-mandated program or higher level of service. The ERAF legislation did not result in increased actual expenditures, and [Cal. Const., art. XIII B, § 6](#), is expressly concerned with costs incurred by local government as a result of state-mandated programs. No duty of subvention is triggered where the local agency is not required to expend its tax proceeds. The court also held that Prop. 98 (amending [Cal. Const., art. XVI, § 8](#), to provide a minimum level of funding for schools), conferred no right of subvention on counties so as to require reimbursement under [Cal. Const., art. XIII B, § 6](#).

The court further held that the ERAF legislation did not violate home rule principles. (Opinion by Marchiano, J., with Strankman, P. J., and Swager, J., concurring.)

HEADNOTES

Classified to California Digest of Official Reports

(1)

State of California § 12--Fiscal Matters--Appropriations--Reimbursement of Local Government for State-mandated Program--Judicial Review of Statutes.

The determination whether statutes have established a mandate under [Cal. Const., art. XIII B, § 6](#), is a question of law. Also, where the facts underlying the case were undisputed, the appellate court reviews the issues as questions of law.

(2)

Constitutional Law § 39--Distribution of Governmental Powers--Between Branches of Government--Legislative Power. Unlike the federal Constitution, the California Constitution sets out limitations on the Legislature's power. The state Legislature has the entire lawmaking authority of the state. Furthermore, all intendments favor the exercise of the Legislature's plenary authority. Any doubts regarding the Legislature's power are resolved in favor of the exercise of that power. Limitations on that power are strictly construed and are not extended by implication.

(3)

Legislature § 5--Powers--Taxation--Allocation of Local Property Tax Revenues.

The principle that the Legislature may exercise all powers not denied to it by the Constitution is of particular importance in the field of taxation, in which the Legislature is generally supreme. The provisions on taxation in the state Constitution are a limitation on the Legislature's power rather than a grant to it. The Legislature's authority to impose taxes and regulate the collection thereof exists unless it has been expressly eliminated by the Constitution. When considering the Legislature's considerable powers regarding budget and tax matters, the Legislature, not the court, decides where tax revenues will be allocated. Barring a statutory or constitutional violation, the court will not stop the Legislature if it transfers revenue from one place to another. Allocation of local property tax revenues is an appropriate exercise of the Legislature's authority regarding taxes. When acting to allocate taxes among various entities, the Legislature is acting within its particular sphere of power and discretion. Constitutional provisions will not be extended by implication to curtail the proper exercise of that power.

(4a, 4b, 4c)

Schools § 12.5--School Districts--Funding--Reallocation of Property Taxes to Educational Revenue Augmentation Funds--State Mandates-- Reimbursement of Local Governments--New Programs and Higher Levels of Service.

After the Legislature reduced property taxes previously allocated to local governments and simultaneously placed an equal amount of property tax revenues into Educational Revenue Augmentation Funds (ERAF's) for distribution to school districts (Rev. & Tax. Code, former § 97.03, now [Rev. & Tax. Code, §§ 97.2 & 97.3](#); [Ed. Code, § 41204.5](#)), counties were not entitled to reimbursement under [Cal. Const., art. XIII B, § 6](#) (part of Prop. 4 pertaining to reimbursement of local governments for state-mandated new program or higher level of service), since the ERAF legislation did not amount to the imposition of a state-mandated program or higher level of service. The ERAF legislation did not result in increased actual expenditures, and [Cal. Const., art. XIII B, § 6](#), is expressly concerned with costs incurred by local government as a result of state-mandated programs. No duty of subvention is triggered where the local agency is not required to expend its tax proceeds. Also, [Gov. Code, §§ 17500-17630](#), were enacted by the Legislature to implement [Cal. Const., art. XIII B, § 6](#), and the obvious view of the Legislature, based on these enactments, is that reimbursement is intended to replace actual costs incurred. Moreover, [Cal. Const., art. XIII B, § 6](#), prohibits the state from shifting to counties the costs of state programs for which the state assumed complete financial responsibility before their adoption, and school funding, at the time [Cal. Const., art. XIII B, § 6](#), became effective, was already a jointly funded partnership between the state and local governments. Such joint budget allocations are not subject to [Cal. Const., art. XIII B, § 6](#).

[See 9 Witkin, Summary of Cal. Law (9th ed. 1989) Taxation, § 123.]

(5)

Constitutional Law § 13--Construction of Constitutions--Language of Enactment--Reimbursement of Local Governments.

Analysis of a reimbursement claim under [Cal. Const., art. XIII B, § 6](#) (reimbursement of local government for state-mandated new program or higher level of service), includes an assessment of the language of the constitutional provision, including the explicit requirements of costs of a new program or higher level of service as well as the purpose of the voters in seeking to prevent new, unfunded mandates in light of the spending limits of [article XIII B, Cal. Const., art.](#)

[XIII B, § 6](#), does not provide subvention for every increased cost mandated by state law. In passing the initiative, the voters did not intend that all local costs resulting from compliance with state law would be reimbursable, but intended to prevent the perceived attempt by the state to enact legislation or adopt administrative orders creating programs to be administered by local agencies, thereby transferring to those agencies the fiscal responsibility for providing services the state believed should be extended to the public.

(6)

Constitutional Law § 10--Construction of Constitutions--Legislature's Adoption of Particular Construction by Statute. Where a constitutional provision may have different meanings, it is a fundamental rule of constitutional construction that, if the Legislature has by statute adopted one, its action in this respect is well nigh, if not completely, controlling.

(7)

Schools § 12.5--School Districts--Funding--Reallocation of Property Taxes to Educational Revenue Augmentation Funds--State Mandates--Reimbursement of Local Governments--New Programs and Higher Levels of Service--Proposition 98.

After the Legislature reduced property taxes previously allocated to local governments and simultaneously placed an equal amount of property tax revenues into Educational Revenue Augmentation Funds (ERAF's) for distribution to school districts (Rev. & Tax. Code, former § 97.03, now [Rev. & Tax. Code, §§ 97.2 & 97.3](#); [Ed. Code, § 41204.5](#)), Prop. 98 (amending [Cal. Const., art. XVI, § 8](#), to provide a minimum level of funding for schools), conferred no right of subvention on counties so as to require reimbursement under [Cal. Const., art. XIII B, § 6](#). Prop. 98 does not appropriate funds or result in a mandated county program or higher level of service that the counties had not previously supported through property tax allocations. The power to appropriate funds was left in the hands of the Legislature. Prop. 98 merely provides the formulas for determining the minimum to be appropriated every budget year. The state's obligation is to ensure specific amounts of moneys are applied by the state for education. Budgetary decisions that allocate funds to various state agencies or political subdivisions cannot be placed in the category of mandates that require subvention. Such decisions, of necessity, impact different agencies of the state or political subdivisions, with some getting more funds as others get less. Local governments do not have claims to specified portions of the budget in each budget year, and absent some entitlement to the claimed revenues, the counties could not prevail in their action for reimbursement.

(8)

Schools § 12--School Districts--Funding--School Funds--Reallocation of Property Taxes to Educational Revenue Augmentation Funds--Home Rule.

The Legislature's reduction of property taxes previously allocated to local governments, and the simultaneous placement of an equal amount of property tax revenues into Educational Revenue Augmentation Funds (ERAF's) for distribution to school districts (Rev. & Tax. Code, former § 97.03, now [Rev. & Tax. Code, §§ 97.2 & 97.3](#); [Ed. Code, § 41204.5](#)), did not violate home rule principles. The home rule principle refers to a local government's power to control and finance its own local affairs. Neither the record in the present case, nor the ERAF legislation, suggested that the Legislature had infringed upon the counties' discretionary affairs so as to interfere with the rights of local residents to home rule. Home rule could not be used as a bar to budget allocation decisions.

COUNSEL

Bill Lockyer, Attorney General, Manuel M. Medeiros, Assistant Attorney General, Andrea Lynn Hoch, Kenneth R. Williams and Daniel G. Stone, Deputy Attorneys General, for Real Parties in Interests and Appellants.

Olson, Hagel, Leidigh, Waters & Fishburn, N. Eugene Hill, Deborah B. Caplan and Lance H. Olson for Commission on State Mandates as Amicus Curiae on behalf of Real Parties in Interest and Appellants.

Steven M. Woodside, County Counsel, Kathleen A. Larocque and Sally B. McGough, Deputy County Counsel, for Plaintiff and Respondent and for Interveners and Respondents.

Trevor A. Grimm, Jonathan M. Coupal and Timothy A. Bittle for Howard Jarvis Taxpayers Association as Amicus Curiae on behalf of Plaintiff and Respondent.

McMurchie, Weill, Lenahan, Lee & Slater, David W. McMurchie and Vicki E. Hartigan for California Special Districts Association, California Association of Recreation and Park Districts, California Association of Public Cemeteries and Mosquito and Vector Control Association of California as Amici Curiae on behalf of Plaintiff and Respondent. *1269
No appearance for Defendant and Respondent.

Burke, Williams & Sorensen and Leland C. Dolley for 95 California Cities as Amici Curiae.

MARCHIANO, J.

In response to a budget crisis in 1992, the Legislature reduced the share of property taxes previously allocated to local governments and simultaneously placed an equal amount of property tax revenues into Educational Revenue Augmentation Funds (ERAF's) for distribution to school districts.¹ The County of Sonoma (the County) then sought reimbursement pursuant to [article XIII B, section 6](#) of the California Constitution (section 6), contending that the ERAF legislation amounted to the imposition of a state mandated program or higher level of service.² The Commission on State Mandates (Commission) determined that section 6 does not apply to this reallocation of tax revenues. The superior court disagreed and issued a writ of mandate ordering the Commission to conduct further proceedings to determine the amount of reimbursement due to the County. The issue raised by this appeal is whether enactment of the ERAF legislation resulted in costs to the County for a state mandated new program or higher level of service, thereby requiring reimbursement pursuant to section 6.

We conclude that the state is not obligated to reimburse local governments for this change in the allocation of property tax revenues. The reallocation of revenue resulting from the challenged legislation does not result in reimbursable "costs" within the meaning of section 6. Furthermore, shifting the percentage of responsibility for a program that was jointly funded by state and local governments at the time section 6 became effective is not the *1270 imposition of a "new program or higher level of service." (*Ibid.*) We reverse the trial court's judgment.

Background

The challenged legislation added [section 97.03 to the Revenue and Taxation Code](#). The legislation reduced the amount of property tax revenue to be allocated to local government pursuant to a specified formula and allocated an equal amount of revenue to the ERAF for distribution to county school districts.³ ([Rev. & Tax. Code, § 97.2.](#)) At the same time, the Legislature enacted Senate Bill No. 766 (1991-1992 Reg. Sess.), which added [section 41204.5 to the Education Code](#). The new Education Code provision had the effect of decreasing the amount of the state's contribution to the constitutionally mandated minimum funding level for education in the amount of the allocation to the county ERAF's.⁴

Our resolution of the issues presented by this appeal is aided by a review of the changes in the state's role in school finance, including the *Serrano* cases, Proposition 13, and the post-Proposition 13 legislative scramble to replace property tax revenues in the state budgetary scheme. Understanding *1271 which entity had the responsibility for funding education on July 1, 1980, when section 6 became effective is necessary for an analysis of the issues raised in this case. The legislative action in 1992 did not spring up full-grown like Venus from the sea, but rather grew out of decades of developments in school funding and tax restrictions. Placing the issue in the proper historical context makes it clear that school finance has always been a partnership involving state and local financing buffeted at times by the external forces of initiatives, variable economic conditions in California, and court decisions interpreting constitutional provisions.

After reviewing the litigation, legislation, initiative measures, and specific events leading to this appeal, we proceed to an analysis of the purpose and requirements of subvention for state-mandated programs and conclude that neither a cost nor a new program has been created by the ERAF legislation. We begin with a historical review of the fluid nature of school funding in California.

The 1960's: State and Local Roles in School Funding

In the late 1960's, California public schools derived over 90 percent of their financial support from local taxes on real property, supplemented by the State School Fund.⁵ (*Serrano v. Priest* (1971) 5 Cal.3d 584, 591 & fn. 2 [96 Cal.Rptr. 601, 487 P.2d 1241, 41 A.L.R.3d 1187] (*Serrano I*.) The Legislature authorized local governments to levy taxes on real property to meet the needs of the district's schools. Most of the balance of a school district's revenue came from the state. (*Id.* at p. 592.) Specifically, in this pre-*Serrano I* and pre-Proposition 13 period, 55.7 percent of school revenues came from local property taxes and 35.5 percent from state aid.⁶ (*Serrano I, supra*, at p. 591, fn. 2.) During this time the Legislature determined the manner of school financing shared by local government. *1272

1971-1976: The Serrano Litigation

The disparity created by reliance on the value of a district's real estate was challenged in 1971 on constitutional grounds in *Serrano I*. The court determined that the system of school financing impermissibly discriminated based on the wealth of the district. (*Serrano I, supra*, 5 Cal.3d at pp. 598, 614-615.) The result was that the quality of a child's education was irretrievably tied to the wealth of the residents of the district. (*Id.* at pp. 599-601.) The *Serrano I* court remanded the case for a trial on the merits. (*Id.* at p. 619.)

During the trial of the remanded *Serrano I* case, the Legislature passed new legislation that increased the amount of state aid to schools, limited expenditures and tied the limitations to inflation adjustments so that districts with higher local revenues received smaller upward adjustments. (*Serrano II, supra*, 18 Cal.3d at pp. 736-737, 742-743.) At this juncture in school funding, financial responsibility was still primarily with local government, with the state supplying aid in an attempt to remedy the deficiencies identified by the Supreme Court. The Legislature continued to determine the manner of school financing.

In *Serrano II*, the court again determined that the state's school finance structure violated the California Constitution despite the legislative attempts to remedy the perceived discrimination. (*Serrano II, supra*, 18 Cal.3d at p. 768.) The court found that the system impermissibly "renders the educational opportunity available to the students of this state a function of the taxable wealth [per pupil] of the districts in which they live" (*Id.* at p. 769.)

After *Serrano II*, the Legislature passed Assembly Bill No. 65 (1977-1978 Reg. Sess.) to increase the ability of poorer districts to raise funds by providing state assistance if actual revenues fell below a scheduled amount. In addition, specified "squeeze" formulas served to decrease the inflation adjustment for wealthier districts and to transfer revenues from high to low wealth districts. (Stats. 1977, ch. 894, § 16.5, p. 2681; Comment, *Inequalities in California's Public School System: The Undermining of Serrano v. Priest and the Need for a Minimum Standards System of Education* (1999) 32 Loyola L.A. L.Rev. 583, 599.) It has been said that the Legislature's attempt to respond to the *Serrano* decisions resulted in "a true 'power equalizing' system whereby local property tax revenue was to be redistributed from tax-rich to tax-poor districts." (Comment, *Educational Financing Mandates in California: Reallocating the Cost of Educating Immigrants Between State and Local Governmental Entities* (1994) 35 Santa Clara L.Rev. 367, 392.) School finance remained, however, a jointly funded system. *1273

1978: Proposition 13 and the Legislative Response

Before Assembly Bill No. 65 could take effect, the voters passed Proposition 13 in 1978, which fundamentally restricted the ability of local governments to raise funds to finance schools through local property tax revenues. Proposition 13 involved several elements, including limitations on the tax rate on real property and on increases in the assessed value of real property. The measure also limited any future changes in state taxes to those passed by two-thirds of the Legislature, and future changes in local tax increases to those imposed by a two-thirds vote of the electors. (*Amador Valley Joint*

Union High Sch. Dist. v. State Bd. of Equalization (1978) 22 Cal.3d 208, 220 [149 Cal.Rptr. 239, 583 P.2d 1281] (*Amador Valley*).

The consequences of Proposition 13 were perceived as catastrophic. “Although California is renowned for its earthquakes, no tremor of high Richter-scale proportion has shaken it quite like the enactment of Proposition 13. Every local entity in the state feared potential economic collapse in the aftershock of that momentous decision by the people.” (*Jarvis v. Cory* (1980) 28 Cal.3d 562, 573 [170 Cal.Rptr. 11, 620 P.2d 598] (*Jarvis*)). Despite the dire predictions, Proposition 13 was upheld as a valid constitutional amendment in *Amador Valley, supra*, 22 Cal.3d 208.

“Because the state had accrued a sizeable surplus of funds, it was immediately called upon to help maintain local governments through the initial period of drastic revenue loss.” (*Jarvis, supra*, 28 Cal.3d at p. 573.) Proposition 13 provided that property taxes, at the reduced amount, were to be “collected by the counties and apportioned according to law to the districts within the counties.” (Cal. Const., art. XIII A, § 1, subd. (a).) As noted by the Legislative Analyst's comment in the California voters pamphlet, there was no state law at the time that provided for the distribution of these revenues. (Ballot Pamp., Primary Elec. (June 6, 1978) pp. 56-57.) The Legislature acted quickly to fill this void.

The Legislature enacted Senate Bill No. 154 (1977-1978 Reg. Sess.), an emergency “bailout” bill, effective for the 1978-1979 fiscal year, providing that the state would distribute the reduced pool of property tax revenues. (Stats. 1978, ch. 332, § 36, p. 706; *Jarvis, supra*, 28 Cal.3d at p. 574.) The state also provided block grants and relieved counties of the costs of various health and welfare programs. Additional state aid was allocated to the public schools on a sliding scale, to attempt to guarantee to each school district 85 percent (for higher revenue districts) to 91 percent (for lower revenue districts) of the revenue it would have been allocated if Assembly Bill No. *1274 65 had been implemented. (*Arvin Union School Dist. v. Ross* (1985) 176 Cal.App.3d 189, 196 [221 Cal.Rptr. 720]. Senate Bill No. 154 was a temporary one-year measure that increased state aid to schools, but did not place full financial responsibility on the state.

1979-1980: The Assembly Bill No. 8 Shift of Funds to Local Governments

The most important legislation, for purposes of this appeal, is Assembly Bill No. 8 (1979-1980 Reg. Sess.), the long-term attempt to address the post-Proposition 13 financial problems of schools and other local entities. (Stats. 1979, ch. 282, p. 959.) The initial provisions of Assembly Bill No. 8 took effect in the 1979-1980 fiscal year. The long-range financing provisions of Assembly Bill No. 8 did not become effective until the 1980-1981 year.

It is undisputed and a part of the administrative record in this case, that in 1979, the Legislature reduced the share of local property tax revenues allocated to schools from approximately 53 percent to approximately 35 percent and made up the difference with state funds. The property tax revenue allocated to counties was increased from approximately 30 percent to approximately 32 percent, the allocation to cities was increased from approximately 10 to approximately 15 percent and the allocation to special districts was increased from approximately 7 to approximately 18 percent. (See also Legis. Analyst, analysis of Assem. Bill No. 8 (1979-1980 Reg. Sess.) as amended June 21, 1979.)

Each school district received a share of the reduced pool of property taxes in the county in proportion to the share received in the 1978-1979 school year. Additional aid from state funds was supplied to replace the reduction in property taxes. (Assem. Conf. Com. on Long-term Local Gov. & School Financing, Rep. on Assem. Bill No. 8 (1979-1980 Reg. Sess.) as amended July 19, 1979, p. 8.) Although in the aftermath of Proposition 13, the state's percentage of support for schools increased from the pre-*Serrano* days, joint state and local funding responsibility for school districts existed when section 6 became effective on July 1, 1980. (Cal. Const., art. XIII B, § 10.)

The 1992 Reallocation to ERAF's

School funding practices remained relatively stable until enactment of the 1992-1993 legislation that forms the basis for the claim of subvention in this case. “The State of California faced an unprecedented budgetary crisis at the outset of

fiscal year 1991-1992, with expenditures projected to exceed revenues by more than \$14 billion.” (*Department of Personnel Administration v. Superior Court* (1992) 5 Cal.App.4th 155, 163 [6 Cal.Rptr.2d 714].) *1275 In 1992, the Legislature enacted the bill that was subsequently codified as [Revenue and Taxation Code section 97.2](#). That statute reduced the post-Proposition 13 allocation of property taxes to local governments and allocated amounts equal to those reductions to county ERAF's for distribution to the county schools. (Stats. 1992, ch. 699, § 12, p. 3093; Stats. 1992, ch. 700, § 4, p. 3120 [Sen. Bill No. 844 (1991-1992 Reg. Sess.) rewriting the provisions of the prior bill]; see Historical and Statutory Notes, 59 West's Ann. Rev. & Tax. Code (1998 ed.) foll. former §§ 97.01 to 97.05, p. 174.)

By 1993, the recessionary economy and the growing revenue requirements of schools jeopardized the state's ability to finance even essential state functions. Given the bleak economic circumstances, the Governor determined that education, along with public safety, had to receive priority over state funding of other local services. The result was that the 1993-1994 budget again reduced the amount of the post-Proposition 13 bailout to local government and reallocated local property tax revenues to ERAF's.⁷ (Governor's Budget Summary, 1993-1994, pp. 44, 92-93.)

The ERAF reallocation design can be summarized as requiring reduction of property tax revenues previously allocated to counties by use of a specified formula, deposit of the reduced amounts into ERAF's, and distribution of the ERAF funds to schools. Another portion of the same legislation deemed the ERAF revenues to be part of the state General Fund revenues for purposes of calculating the minimum educational funding guarantee under Proposition 98.⁸ The overall result of these statutes is that the tax revenues of the counties are decreased, school revenues remain the same, and the minimum school funding guarantee of Proposition 98 is satisfied in part by the ERAF funds. This legislative adroitness fulfilled the funding of Proposition 98 by reallocating available finite funds from one local governmental *1276 entity to another. (Legis. Analyst, Rep. to Joint Legis. Budget Com., analysis of 1993-1994 Budget Bill, p. 90.)⁹

Concurrently with the ERAF legislation, and thereafter, the state cushioned the loss of revenue to local governments through a variety of mitigation measures, including an additional sales tax, that was established in the Constitution by the voters in 1993, trial court funding reform, supplemental funding for special police protection districts, grants of authority to counties to reduce general assistance levels, loans for property tax administration and a one-time mitigation of \$292 million. The effects of the ERAF legislation and the state's efforts to offset those effects continue to the present time. (Governor's Budget Summary, 1999-2000, pp. 41-43; Legis. Analyst, Rep. to Joint Legis. Budget Com., The 1999-00 Budget: Perspectives and Issues, pp. 154-157.)

The ERAF legislation has been challenged and upheld. In *County of Los Angeles v. Sasaki* (1994) 23 Cal.App.4th 1442 [29 Cal.Rptr.2d 103] (*Sasaki*) and *San Miguel Consolidated Fire Protection Dist. v. Davis* (1994) 25 Cal.App.4th 134 [30 Cal.Rptr.2d 343] (*San Miguel*), the courts upheld the legislation against constitutional challenges. The petitioner in *San Miguel* also argued that it was entitled to offset reimbursement owed by the state against any shifting of property tax revenues. (*San Miguel, supra*, 25 Cal.App.4th at pp. 142-143.) The court rejected the claim of offset as premature, noting that claims for payment had been submitted to the state but had not yet been adjudicated. (*Id.* at pp. 155-156.)

This case now raises the issue foreshadowed in *San Miguel*.¹⁰ The counties here argue that the challenged reallocation of property tax revenues is a state-mandated cost of a new program, entitling the affected local governments to reimbursement. ([Gov. Code, § 17500 et seq.](#); § 6.) *1277

Background of This Appeal - The Test Claim

After the adverse decisions for the county and special district in *Sasaki, supra*, 23 Cal.App.4th 1442, and *San Miguel, supra*, 25 Cal.App.4th 134, the County and 47 other counties (collectively, the Counties) filed a test claim with the Commission, pursuant to the provisions of section 6 and the implementing legislation of [Government Code section 17500 et seq.](#)¹¹ The County claimed that it had been subjected to a new program or an increased level of service for which

subvention was required. The “new” program or service was identified as the state's shift of local property tax revenues to ERAF's and the contemporaneous reduction in the amount the state contributed to meet the Proposition 98 minimum funding goal for schools.¹² The County argued that these two actions combined to force local government to bear the financial burden of Proposition 98 funding that had formerly been financed solely by the state.

On November 30, 1998, following public hearings on the test claim, the Commission issued its decision rejecting the claim. The Commission based its denial of the test claim on its conclusion that although the test claim legislation reduced county revenues, it did not impose a spending program.

The Action in the Superior Court

On March 17, 1999, the County challenged the Commission's decision by filing both a petition for writ of administrative mandate pursuant to [Code of Civil Procedure section 1094.5](#) and a complaint for declaratory relief in the superior court.

The petition alleged that the ERAF legislation imposed a new program or higher level of service and required reimbursement of nearly \$5 billion to local governments for the 1996-1997 and 1997-1998 fiscal years. The second cause of action for declaratory relief alleged the same facts, but added that by the Legislature's actions in shifting the allocation of funds to the ERAF's and deeming the shift to have occurred in 1986-1987 for purposes of paragraph (b)(1) of Proposition 98, the state reduced the percentage of state funds allocated to education from 40 percent to 34 percent. The second cause of action requested a declaration that the state may not exercise its power to allocate property taxes without reimbursing local ***1278** governments, that the California Constitution requires reimbursement whenever the state shifts property tax revenues from one local entity to another for state purposes, that funding education is a state obligation, and that the state cannot increase the percentage of public school funding derived from property tax revenue without reimbursing local governments in an equal amount. In May of 1999, the court allowed an additional 53 counties to intervene in the action.

On October 21, 1999, the court granted a motion to dismiss the second cause of action, finding that the request for declaratory relief addressed issues that were neither definite nor concrete in the factual context of the case, which involved the Commission's rejection of the test claim. On the same date, after reviewing the administrative record, the briefs of the parties, and hearing argument, the court filed its statement of decision finding that the ERAF legislation: “created a new program or higher level of service which requires reimbursement under [Article XIII B, section 6 of the California Constitution](#) since the shift of local property taxes compels the counties to accept financial responsibility in whole or in part for a program which was required to be funded by the State by the enactment of Proposition 98.” The requested writ of mandate issued on November 18, 1999. The State of California, California Department of Finance, and the Director of the Department of Finance appealed from the judgment directing issuance of the writ.¹³

Based on our review of the relevant historical events, focusing on the language of [section 6](#) and the challenged legislation, we determine that the trial court improperly looked to the use made of the reallocated revenues instead of whether the legislation mandates costs due to a new program or higher level of service for a program previously funded entirely by the state as required by the Constitution, interpretive case law, and implementing statutes.

Discussion

Decisions of the Commission are reviewed by petition in the superior court pursuant to [Code of Civil Procedure section 1094.5](#), “on the ground that the commission's decision is not supported by substantial evidence. The court may order the commission to hold another hearing regarding the claim ***1279** and may direct the commission on what basis the claim is to receive a rehearing.” ([Gov. Code, § 17559](#), subd. (b).) **(I)** Although the statute references a substantial evidence standard of review, “[t]he determination whether the statutes here at issue established a mandate under [section 6](#) is a

question of law.” (*County of San Diego v. State of California* (1997) 15 Cal.4th 68, 109 [61 Cal.Rptr.2d 134, 931 P.2d 312] (*County of San Diego*.) The facts underlying this case were undisputed, thus we review the issues as questions of law.

Limited Scope of Issues Addressed in This Appeal

It is important at the outset of this discussion to clarify the scope of the issues raised by this appeal and identify issues that are not properly before us on an appeal from a subvention decision. As our Supreme Court cautioned a decade ago, in evaluating a claim for subvention, we cannot become entangled in consideration of where the benefit of questioned state action falls. In *City of Sacramento v. State of California* (1990) 50 Cal.3d 51 [266 Cal.Rptr. 139, 785 P.2d 522] (*City of Sacramento*), the court cautioned that subvention does not depend on “whether the 'benefit' of a state-imposed local requirement falls principally at the state or local level. Attempts to apply such a 'benefit' test to the myriad of individual cases could easily produce debates bordering on the metaphysical. Nothing in the language or history of [article XIII B](#), or prior subvention statutes, suggests an intent to force such debates upon the Legislature each time it considers legislation affecting local governments.” (*Id.* at p. 70, fn. 14.)

In addition, this appeal does not encompass an attack on the constitutionality, wisdom, or propriety of the state's budget process that resulted in the ERAF legislation. The original complaint in the superior court contained a second cause of action for declaratory relief requesting a wide-ranging declaration that, among other things, funding education is a state obligation, the state may not exercise its power to allocate tax revenues in a manner that interferes with home rule powers, [section 6](#) established the state's obligation to fund education solely from the General Fund, and Assembly Bill No. 8 froze the amount of property taxes that may be allocated to schools. However, that cause of action was dismissed by the trial court, and no appeal or cross-appeal was filed regarding that claim. Issues raised by the second cause of action are not properly before us in this appeal by the state.¹⁴

Finally, we note that the court in *Sasaki, supra*, [23 Cal.App.4th 1442](#), held that the county plaintiffs in that case lacked standing to challenge the ***1280** constitutionality of [Education Code section 41204.5](#). That court reasoned that the matter of how the state treats revenues it allocates to educational entities may concern the educational entities, but no theory would entitle a county to a writ of mandate negating that code section. (*Sasaki, supra*, [23 Cal.App.4th at p. 1449](#).) In *San Miguel, supra*, [25 Cal.App.4th 134](#), the court acknowledged a question as to whether special districts could challenge the constitutionality of the ERAF legislation, but indicated that individual taxpayer plaintiffs in that case had standing. (*Id.* at pp. 143-145.) The only plaintiffs in this action are counties. Thus, the only issues properly before us are those bearing on the question of whether the decision to reallocate a portion of property tax revenues in the challenged years results in a state mandated cost for a new program or higher level of service such that subvention is required. We have no wish to become enmeshed in the metaphysical debates that the court warned against in *City of Sacramento*. (*City of Sacramento, supra*, [50 Cal.3d at p. 70](#).) This case does not involve whether it was legally prudent to rob Peter to pay Paul.¹⁵ Consequently, we decline to expand our consideration to issues of the identity of the beneficiary of the allocation or the constitutionality of legislation relating to school entities. We confine our discussion to the question of subvention.

Rules of Constitutional Construction

(2) Unlike the federal Constitution, our state Constitution sets out limitations on the power of the Legislature. (*California Teachers Assn. v. Hayes* (1992) 5 Cal.App.4th 1513, 1531 [7 Cal.Rptr.2d 699] (*Hayes*.) The state Legislature has the “entire lawmaking authority of the state ...” (*Ibid.*) Furthermore, “all intendments favor the exercise of the Legislature's plenary authority ...” (*Id.* at p. 1532.) Any doubts regarding the Legislature's power are resolved in favor of the exercise of that power. Limitations on that power are strictly construed and are not extended by implication.

(3) The principle that the Legislature may exercise all powers not denied to it by the Constitution “is of particular importance in the field of taxation, in which the Legislature is generally supreme....” [t]he provisions on taxation in the state Constitution are a limitation on the power of the Legislature rather than a grant to it. [Citations.] Its power in

the field of *1281 taxation is limited only by constitutional restrictions.” [Citation.] In other words, the Legislature's authority to impose taxes and regulate the collection thereof exists unless it has been *expressly* eliminated by the Constitution. [Citations.]” (*Sasaki, supra*, 23 Cal.App.4th at pp. 1453-1454, citing *Armstrong v. County of San Mateo* (1983) 146 Cal.App.3d 597, 624 [194 Cal.Rptr. 294].)

When considering the Legislature's considerable powers regarding budget and tax matters, “the Legislature, not this court, decides which of the innumerable public mouths tax revenues will feed. Barring a statutory or constitutional violation, it is not for this court to stop the Legislature if it transfers revenue from Peter to compensate Paul” (*Arcadia Redevelopment Agency v. Ikemoto* (1993) 16 Cal.App.4th 444, 453 [20 Cal.Rptr.2d 112] (*Arcadia*)). “Under these principles, there is no basis for applying section 6 as an equitable remedy to cure the perceived unfairness resulting from political decisions on funding priorities.” (*City of San Jose v. State of California* (1996) 45 Cal.App.4th 1802, 1817 [53 Cal.Rptr.2d 521] (*City of San Jose*)).

Allocation of local property tax revenues is an appropriate exercise of the Legislature's authority regarding taxes. In *Amador Valley, supra*, 22 Cal.3d 208, the court upheld Proposition 13 and the vesting in the Legislature of the general power to allocate revenues from local property taxes. (22 Cal.3d at pp. 225-226.) The court noted that the Legislature was not thereby empowered to reward or punish local agencies and thereby undermine local power to address regional issues by withholding funds. The court explained that Proposition 13 did not empower the state to “direct or control local budgetary decisions or program or service priorities ...” or otherwise interfere with local decisionmaking. (22 Cal.3d at p. 226.) However, the *Amador Valley* court specifically stated that legislation that merely allocates funds on a pro rata basis, without imposing conditions on the local entity's use of the funds is a valid exercise of the state's authority under Proposition 13. (22 Cal.3d at p. 227.)

Courts have upheld the Legislature's specific power to reduce a county's allocated share of property taxes. In *Sasaki*, the court reviewed the same legislation that is the basis of the claim for subvention in this appeal. The court traced the history of education funding from *Serrano* through the post-Proposition 13 legislation, noting that the Legislature's bailout of counties and distribution of the remaining tax revenues was upheld in *Amador Valley*. (*Sasaki, supra*, 23 Cal.App.4th at pp. 1450-1452.) The *Sasaki* court recognized that in the wake of Proposition 13, the state assumed a larger *1282 share of the funding of schools, but found no intent to prevent the state from altering the proportionate shares of revenue to address future changed conditions. (*Sasaki, supra*, 23 Cal.App.4th at p. 1456.) The fact that the state shifted revenue away from the schools and towards local government after Proposition 13 did not restrict the state's power to change the allocation again, “in the context of comprehensive legislative planning for the funding of both entities from a variety of sources, including property tax revenue.” (*Sasaki, supra*, 23 Cal.App.4th at p. 1457.)

When acting to allocate taxes among various entities, the Legislature is acting within its particular sphere of power and discretion. Constitutional provisions will not be extended by implication to curtail the proper exercise of that power. Keeping these principles in mind, we turn to an analysis of the requirements of section 6 to determine whether the challenged allocation of property tax revenues necessitates subvention to the Counties.

Section 6 Subvention Is Intended for Increases in Actual Costs

([4a]) In the November 1979 election, the voters passed Proposition 4, which included section 6, and was intended as a complementary measure to Proposition 13. Designated “the Spirit of 13,” the initiative provided for a constitutional limitation on government spending. (Ballot Pamp., Special Statewide Elec. (Nov. 6, 1979) p. 18.) As incorporated in California Constitution, article XIII B, Proposition 4 was intended to “require state and local governments to limit their budgets” (Ballot Pamp., Special Statewide Elec., *supra*, p. 18; *County of San Diego, supra*, 15 Cal.4th at p. 81.) In addition, voters were told that section 6 of Proposition 4 was intended to prevent state government attempts “to force programs on local governments without the state paying for them.” (Ballot Pamp., Special Statewide Elec., *supra*, p. 18.)

[Section 6](#) provides: “Whenever the Legislature ... mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service”¹⁶ As noted in *Lucia Mar Unified School Dist. v. Honig* (1988) 44 Cal.3d 830 [244 Cal.Rptr. 677, 750 P.2d 318] (*Lucia Mar*), the principle of reimbursement was “enshrined in the Constitution ... to provide local entities with the assurance that state mandates would not place additional burdens on their increasingly limited revenue resources.” (*Id.* at p. 836, fn. 6.) *1283

([5]) Analysis of a [section 6](#) reimbursement claim includes an assessment of the language of the constitutional provision, including the explicit requirements of “costs” of a “new program or higher level of service” as well as the purpose of the voters in seeking to prevent new, unfunded mandates in light of the spending limits of California Constitution, article XIII B. (*County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 56 [233 Cal.Rptr. 38, 729 P.2d 202] (*County of Los Angeles*)). [Section 6](#) does not provide subvention for every increased cost mandated by state law. (*Lucia Mar, supra*, 44 Cal.3d at p. 835.) The court in *County of Los Angeles* confirmed that the voters had not intended that all local costs resulting from compliance with state law would be reimbursable, but intended to prevent: “the perceived attempt by the state to enact legislation or adopt administrative orders creating programs to be administered by local agencies, thereby transferring to those agencies the fiscal responsibility for providing services which the state believed should be extended to the public.” (*County of Los Angeles, supra*, 43 Cal.3d at p. 56.)

([4b]) The trial court determined that [section 6](#) does not require an actual expenditure of funds as a prerequisite to reimbursement. The court indicated that *Lucia Mar, supra*, 44 Cal.3d 830, and *County of San Diego, supra*, 15 Cal.4th 68, held that no actual cost need be shown if the state has in fact shifted a financial burden to local government. However, the court failed to note that in both *Lucia Mar* and *County of San Diego*, the shift of responsibility to local government resulted in actual expenditures by those entities. In *Lucia Mar*, for example, the state attempted to collect the actual dollar amounts claimed for use of the state schools from the local districts by sending invoices to the schools. (*Lucia Mar, supra*, 44 Cal.3d at pp. 832-833.) Similarly, in *County of San Diego, supra*, 15 Cal.4th 68, the county had to expend funds to provide health care services for a population formerly served solely by the state. San Diego County had a direct and ascertainable cost resulting from the state's action. (*Id.* at pp. 79-80.)

In this case, the County's tax revenues were not expended. No invoices were sent, no costs were collected, and no charges were made against the counties in this case. Contrary to the conclusion of the trial court, it is the expenditure of tax revenues of local governments that is the appropriate focus of [section 6](#). (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487 [280 Cal.Rptr. 92, 808 P.2d 235] (*County of Fresno*) [stating that § 6 was “designed to protect the tax revenues of local governments from state mandates that would require expenditure of such revenues.”].)

An examination of the intent of the voters and the language of Proposition 4 itself supports our conclusion that Proposition 4 was aimed at controlling *1284 and capping government spending, not curbing changes in revenue allocations. [Section 6](#) is an obvious compliment to the goal of Proposition 4 in that it prevents the state from forcing extra programs on local governments in a manner that negates their careful budgeting of expenditures. A forced program that would negate such planning is one that results in increased actual expenditures of limited tax proceeds that are counted against the local government's spending limit. [Section 6](#), located within a measure aimed at limiting expenditures, is expressly concerned with “costs” incurred by local government as a result of state-mandated programs, particularly when the costs of compliance with a new program restrict local spending in other areas. (§ 6.) “No state duty of subvention is triggered where the local agency is not required to expend its proceeds of taxes.” (*Redevelopment Agency v. Commission on State Mandates* (1997) 55 Cal.App.4th 976, 987 [64 Cal.Rptr.2d 270] [Cal. Const., art. XIII B intended to limit spending of the proceeds from taxes].)

Aside from the implications to be drawn from the location of [section 6](#) within the spending limitations of Proposition 4, the Legislature has interpreted California Constitution, article XIII B in subsequent statutes. ([6]) Where a constitutional provision may have different meanings, “!... ”it is a fundamental rule of constitutional construction that, if the Legislature

has by statute adopted one, its action in this respect is well nigh, if not completely, controlling.“ ...! ” (*Arcadia, supra*, 16 Cal.App.4th at p. 452.)

([4c]) Government Code sections 17500 through 17630 were enacted by the Legislature to implement section 6. (*County of Fresno, supra*, 53 Cal.3d at p. 484.) Government Code section 17514 defines “costs mandated by the state” for purposes of section 6 as “any increased costs which a local agency or school district is *required to incur* after July 1, 1980, as a result of any statute ... which mandates a new program or higher level of service of an existing program within the meaning of Section 6 of Article XIII B of the California Constitution.” (Italics added.) Government Code section 17522 defines “annual reimbursement claim” to mean “a claim for *actual costs incurred*” (Italics added.) Similarly, Government Code section 17558.5 refers to a claim for “*actual costs* filed by a local agency” (Italics added.) The obvious view of the Legislature is that reimbursement is intended to replace actual costs incurred, not as compensation for revenue that was never received. The Legislature's view is entitled to significant weight. (*Arcadia, supra*, 16 Cal.App.4th at pp. 452-453.)

The County argues that if an actual cost is required for subvention, the reduced allocation of tax revenues challenged here should be considered *1285 such a cost. But, as noted by the Commission in its brief in support of appellant, when reimbursement for lost revenues is intended by the Constitution, it is clearly expressed. For example article XIII, section 8.5 of the California Constitution regarding postponement of property taxes provides for subvention to local government in “an amount equal to the amount of revenue lost by each by reason of the postponement of taxes” Section 25 of article XIII of the California Constitution, regarding the homeowners property tax exemption, provides for reimbursement to local government “for revenue lost because of Section 3(k).” The presence of these references to reimbursement for lost revenue in article XIII supports a conclusion that by using the word “cost” in section 6 the voters meant the common meaning of cost as an expenditure or expense actually incurred.

In light of the constraints imposed by the rules regarding strict construction of constitutional limitations on the power of the Legislature, and the rule that requires respect for the Legislature's adoption of a particular meaning of a constitutional phrase, we cannot extend the provisions of section 6 to include concepts such as lost revenue, that are not fairly implicated by the history, voter materials, language and legislative interpretation of section 6. We can only conclude that when the Constitution uses “costs” in the context of subvention of funds to reimburse for “the costs of such program,” that some actual cost must be demonstrated, and not merely decreases in revenue.¹⁷

Subvention Cases Involve Programs Previously Funded Exclusively by the State

The trial court stated that *Lucia Mar, supra*, 44 Cal.3d 830, and *County of San Diego, supra*, 15 Cal.4th 68, held that whenever a state shifts a burden to local government, it has established a new program or higher level of service for purposes of subvention. The trial court believed that so long as the local entity could demonstrate a financial burden had been shifted, subvention was necessary irrespective of actual costs or prior funding of the program. Like the trial court, the Counties insist that *Lucia Mar* and *County of San Diego* involve striking similarities to this case and establish that any shift in funding is a new program for purposes of subvention. But there is a critical difference, aside from the issue of actual costs expended, between the facts of *Lucia Mar* and *County of San Diego*, and this case. The programs at issue in the cited cases were entirely funded by the state at the time section 6 became effective. *1286

The County argues that *Lucia Mar* involved a situation in which the state attempted to return to local school districts the cost of educating students at special state schools, a cost the state assumed after Proposition 13. However, any apparent similarity to the reallocation brought about by the ERAF legislation is only superficial. *Lucia Mar* concerned a statute that required a school district to pay part of the cost of educating students from the local district at a state school for the severely handicapped. By July 1, 1980 (the date that § 6 became effective), the state had already assumed the entire responsibility for funding of the state school program. The *Lucia Mar* court found that it violated the purpose of section 6 to compel local governments to “accept financial responsibility in whole or in part for a program which was *funded*

entirely by the state before the advent of [article XIII B](#)” (*Lucia Mar*, *supra*, [44 Cal.3d at p. 836](#), italics added.) Thus, the facts of *Lucia Mar* involved the transfer of costs from a totally state-funded program to the local governmental entities.

County of San Diego, *supra*, [15 Cal.4th 68](#), said by the Counties to extend *Lucia Mar* to a de facto shift of financial responsibility, involved the care of medically indigent persons (MIP) who were not linked to a federal category of disability, but only lacked the income and resources to afford health care. (*Id.* at p. 77.) In 1971, the state extended Medi-Cal coverage to these individuals. At the time the voters adopted [section 6](#), the state provided health care funding for MIP's without any financial contribution from the counties. In 1983 the state excluded those individuals from the Medi-Cal program. ([15 Cal.4th at p. 98.](#)) An existing statute made the counties responsible for treating indigent persons who did not qualify for other aid. (*Id.* at p. 92.) The result of the state's exclusion of the MIP population from Medi-Cal was that their care fell to the counties as providers of last resort under the statute.

The opening paragraph of Justice Chin's opinion in *County of San Diego* expresses this critical part of the holding. “[W]hen the electorate adopted [section 6](#), the state provided Medi-Cal coverage to these medically indigent *adults without requiring financial contributions from counties.*” (*County of San Diego*, *supra*, [15 Cal.4th at p. 75](#), italics added.) This point was amplified in a response to the dissent. “We do not hold that 'whenever there is a change in a state program that has the effect of increasing a county's financial burden ... there must be reimbursement by the state.' ... Rather, we hold that [section 6](#) prohibits the state from shifting to counties the costs of state programs for which the state assumed *complete financial responsibility before adoption of section 6.*” (*Id.* at p. 99, fn. 20, italics added.) *1287

The Counties have ignored the key point in both *Lucia Mar* and *County of San Diego*, that in both cases, the state shifted some part of its sole financial responsibility to the local entity. The forced acceptance of that new financial cost implicates [section 6](#). Neither *Lucia Mar* nor *County of San Diego* held that subvention would be required for a change in allocation of the percentage of responsibility for a program that has always been jointly funded by state and local governments. The unifying concept in those cases was the transfer of actual costs of a program that had been entirely funded by the state at the time [section 6](#) went into effect.

In this case, on July 1, 1980, the funding of education in California was still a joint endeavor between the state and local governments, subject to changing allocations of responsibility. “The system of public school support should effect a partnership between the state, the county, and school districts, with each participating equitably in accordance with its relative ability.” ([Ed. Code, § 14000.](#)) The financing of public schools in California has been, and remains, a complex and sometimes convoluted system of joint responsibility between state and local government. (*Butt v. State of California*, *supra*, [4 Cal.4th 668, 679, fn. 11](#) [describing the Legislature's complex financing scheme utilizing local property tax revenues and state equalizing payments]; *Hayes*, *supra*, [5 Cal.App.4th at p. 1525.](#))¹⁸ Funding for education had not been, and never was fully assumed by the state. As expressed by the court in *Sasaki*, *supra*, [23 Cal.App.4th 1442, 1457](#), “there is a historical fluidity in the fiscal relationship between local governments and schools. The state has shifted property tax revenue both from schools to local governments, and, as in this case, from local governments to schools. These shifts, including the one presently complained of, have been made in the context of comprehensive legislative planning for the funding of both entities from a variety of sources, including property tax revenue.”

Unlike the *Lucia Mar* and *County of San Diego* cases, there is no shift in this case from a totally state-supported status to a forced sharing on the part of local government. The state has not imposed responsibility for any program that local governments have not always had a substantial share in supporting. (Accord, *City of El Monte*, *supra*, [83 Cal.App.4th 266](#) [*Lucia Mar* involved program expenses entirely borne by state].)

The County argues that a number of subvention cases support its contention that the “bedrock” of analysis of any [section 6](#) claim is only whether there was a shift of financial responsibility to local government. However, *1288 those other subvention cases, which we discuss next, do not address the issues raised in this case as clearly as *Lucia Mar* and *County of San Diego*. Nothing in those cases focuses on a shift of responsibility alone as the keystone of subvention analysis.

Rather, the cited cases have turned on other factors. None of the cases found subvention appropriate where the state had not required a local entity to assume financial responsibility for a formerly state funded program. No case holds that changes in the allocation of budgetary amounts to local entities must be offset by subvention.

The other cases regarding reimbursement do not turn on the existence of a shift in only a portion of a jointly funded program. In *Long Beach Unified Sch. Dist. v. State of California* (1990) 225 Cal.App.3d 155 [275 Cal.Rptr. 449], the school district sought reimbursement for the cost of developing desegregation programs. (*Id.* at pp. 164-165.) The court required a specific state mandated action to trigger subvention. The court stated that a mere increase in the cost of providing a service does not trigger reimbursement. (*Id.* at p. 173.) Similarly, in *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1564 [15 Cal.Rptr.2d 547], school districts sought reimbursement for the cost of providing due process hearings in connection with state mandated special education evaluation programs that the districts argued exceeded costs necessitated by federal requirements. (11 Cal.App.4th at p. 1574.) The court determined that a federal mandate would not require state subvention, except “[t]o the extent the state implemented the [federal] act by freely choosing to impose new programs” (*Id.* at pp. 1593-1594.) In *Redevelopment Agency v. Commission on State Mandates, supra*, 55 Cal.App.4th 976, subvention was not appropriate because the financing received by the agency was deemed exempt from section 6. That court also noted that the state was not transferring a program for which it was “formerly legally and financially responsible.”¹⁹ (*Redevelopment Agency, supra*, 55 Cal.App.4th at pp. 986-987.) *1289

We do not find a single case, statute, or administrative ruling that indicates the shifting of percentage allocations of financial responsibility for joint state and locally funded programs requires reimbursement to the local government whenever it receives less money than it did in the previous budget year. The critical point in the analysis is that school funding in California was, at the time section 6 became effective, a jointly funded partnership between the state and local governments. These joint budget allocations are not subject to section 6. To hold otherwise would impermissibly cripple the ability of the Legislature to function in the critical area of budget planning.

Proposition 98 Confers No Right of Subvention on the County

(7) An important premise of the County's argument is that Proposition 98 imposes a requirement that the state may use only funds from the state's General Fund to satisfy the minimum level of school finance. According to the County, if the state uses any other type of funding to satisfy the minimum amount, it must repay whatever source was used. It is this claimed impermissible use of the revenue not allocated to the County that supports the claim of subvention in this case. The County argues that it can trace the state's use of the unallocated revenue, through the provisions of Education Code section 41204.5, to a reduction in the Proposition 98 minimum funding amounts, which proves the County's claim that it was mandated to assume the cost of a program that was previously solely funded by the state.²⁰ The reality is that the County has no claim to revenues it never received and has no basis for challenging the state's methods of allocating funds to other entities.

Proposition 98, adopted by the voters in 1988, amended article XVI, section 8 of the California Constitution to provide a minimum level of funding for schools. (Ballot Pamp., Gen. Elec. (Nov. 8, 1988) p. 78.) The measure, supported by the California Teachers Association and the state Parent-Teacher Association, set up two tests, later expanded by the passage of Proposition 111 in 1990 to three tests, for determining the mandated minimum funding level for the coming year. (*Hayes, supra*, *1290 5 Cal.App.4th at p. 1519, fn. 2.)²¹ The first formula uses a percentage of General Fund revenues appropriated to schools in fiscal year 1986-1987. The second and third formulas use a measure that includes both General Fund revenues and “allocated local proceeds of taxes.” (Cal. Const., art. XVI, § 8, subd. (b).)

In arguing that Proposition 98 establishes a wholly state-funded program that they have been forced to finance, the Counties misconstrue the impact of Proposition 98. Proposition 98 did not alter the state's role in education. (*Hayes, supra*, 5 Cal.App.4th at p. 1533.) Proposition 98 does not appropriate funds nor does it result in some mandated county program or higher level of service that the Counties had not previously supported through property tax allocations. The

power to appropriate funds was left in the hands of the Legislature. Proposition 98 merely provides the formulas for determining the minimum to be appropriated every budget year. The state's obligation is to ensure specific amounts of moneys are applied by the state for education. Budgetary decisions that allocate funds to various agencies of the state or political subdivisions cannot be placed in the category of mandates that require subvention. Such decisions, of necessity, impact different agencies of the state or political subdivisions, with some getting more funds as others get less. Sometimes Peter receives more than Paul. We perceive no intent in Proposition 98's concern for an appropriate level of funding for education that would tie the hands of the Legislature in meeting that goal, particularly in years of low revenues.

Furthermore, local governments do not have a claim to a specified portion of the budget in each budget year. We recognize that the trial court found *1291 that the County had not asserted a claim of entitlement, but the belief in such an entitlement is a necessary foundation for the claim for subvention. The County's case, stripped to its core complaint, is that the County's revenue decreased in the challenged years, not that the Legislature found a different way to meet the Proposition 98 funding requirements for schools. Absent some entitlement to the claimed revenues, the County cannot prevail in this action for reimbursement.

As noted by the court in *San Miguel, supra*, 25 Cal.App.4th 134, the plaintiffs there had “no 'vested right' to receive property tax revenues [citation] and no 'property interest' in such revenues [citation] because 'as against the state, the county [or district] has no ultimate interest in the property under its care.' [Citation.]” (*Id.* at p. 143, italics omitted.) The County in this case argues that *San Miguel* was based on an erroneous historical analysis. The County notes that *San Miguel* relied on *Conlin v. Board of Supervisors* (1893) 99 Cal. 17 [33 P. 753], which predated a 1910 amendment to the Constitution. This reliance, the County contends, reveals the mistaken analysis of the *San Miguel* court because the 1910 amendment to the Constitution provided for strict separation of state and local revenue. Aside from the fact that one accepted purpose of Proposition 13 was to establish state, as opposed to local, control over local property taxes, the *San Miguel* court relied on cases as recent as *Board of Supervisors v. McMahan* (1990) 219 Cal.App.3d 286 [268 Cal.Rptr. 219], which also made it clear that “as against the state, the County has no 'property' interest in its revenues. [A]ll property under the care and control of a county is merely held in trust by the county for the people of the entire state.” (*Id.* at p. 297, italics omitted [county may not challenge state's aid to families with dependent children funding statute requiring county to contribute to state program].) In *Marin Hospital Dist. v. Rothman* (1983) 139 Cal.App.3d 495 [188 Cal.Rptr. 828], this court rejected an argument that a local agency had a vested right to receive tax revenues. (*Id.* at pp. 501-502.) We agree with the *San Miguel* court that political subdivisions of the state have no basis for challenging revenue allocations to another agency and no right to receive a particular allocation of tax revenues themselves.

We also note that even if the Counties prevailed on this argument and the Legislature's reduction of the General Fund component of the guaranteed minimum financing to schools was invalidated, the Counties would not receive any payment as a result. The only consequence of invalidation of the change in the state's General Fund payment would be that the state would be required to pay more to schools in the challenged years, not that a portion of the school's revenue allocation would be revoked and paid to the Counties. *1292 This outcome highlights the reality that the Counties have no legally cognizable interest that would entitle them to challenge the Legislature's manner of funding education. The inclusion of a discussion of Proposition 98 and minimum funding for schools serves only to confuse the issues properly raised in this appeal from a decision ordering subvention for a reduction in revenues.

It is clear from the trial court's opinion that the injection of the Proposition 98 issues into the case obscured the real issues and distorted the outcome below. For example, the trial court framed the issue as being whether “the state can use property taxes to fulfill its obligation to provide funding for schools from the state general fund.” As discussed, local governments have no interest in invalidating state funding allocations to schools. From this mistaken hypothesis, the court made the erroneous determination that because funding a portion of the school budget is solely the state's responsibility, a change in the source of the funding of that portion of the school program implicated principles of subvention.

In its review of the County's claim, the Commission properly focused its inquiry, in conformance with the appropriate narrow construction given to limitations on the Legislature's taxing powers, on whether the reduction in revenues caused by the ERAF legislation required the Counties to expend tax revenues in support of a state program. (*City of El Monte, supra*, 83 Cal.App.4th 266 [Prop. 98 not properly before court on subvention appeal].)

Understanding that the argument of the Counties is at once too narrow and too broad is critical to reaching a correct result in light of the need for a narrow construction of limitations on the state's power to allocate tax revenues. The Counties' argument is too narrow in that it focuses on one aspect of school finance—the minimum funding of Proposition 98—to claim that education is solely a state funded program. The Counties ignore the larger picture that education is and always has been a jointly funded program. The argument is too broad because it encompasses the whole of the budget process for the questioned years in a misguided attempt to trace the decreased revenues to some impermissible use, rather than focusing on the decrease in revenue to the County. In fact, the Counties never received the disputed revenue, and the Counties have no standing to challenge budget allocations to other entities. The Commission properly limited its review of the subvention claim to the decreased allocation of revenue that resulted from the ERAF legislation.

Home Rule Has Not Been Abolished

[8] Returning to an argument considered and rejected in *Amador Valley, supra*, 22 Cal.3d 208, *1293 *City of Rancho Cucamonga v. Mackzum* (1991) 228 Cal.App.3d 929 [46 Cal.Rptr.2d 448], and *Sasaki, supra*, 23 Cal.App.4th 1442, the County contends that the Legislature's decrease of its property tax revenues violates principles of home rule.²² As all of the referenced cases have concluded, from the time of Proposition 13 to the present, home rule has been limited, but not extinguished. As previously noted, this appeal is solely from a subvention decision and does not properly place before us a challenge to the validity of the state's actions. Although the issue of reallocation of local property tax revenues and home rule has been definitively discussed in prior cases, we again note them in response to the County's and amici curiae's repeated raising of this argument.

The principle of home rule refers to a local government's power to control and finance its own local affairs. (*Amador Valley, supra*, 22 Cal.3d at pp. 224-225.) In *Amador*, the court upheld Proposition 13 against a claimed impairment of home rule. The court recognized that a limitation on the ability to levy taxes had a limiting effect on home rule, but stated that nothing in the proposition abrogates home rule “or discloses any intent to undermine or subordinate preexisting constitutional provisions on that subject” (22 Cal.3d at p. 225.) The key reason that the court found that home rule was not improperly infringed was that the funds at issue in that case were allocated to local agencies on a pro rata basis, “without imposing any condition whatever regarding their ultimate use.” (*Id.* at p. 227.)

In *City of Rancho Cucamonga v. Mackzum, supra*, 228 Cal.App.3d 929, the court recognized that “the purpose of Proposition 13 itself was to achieve statewide control over escalating local property tax rates.” (*Id.* at p. 945.) The court determined that Proposition 13 was a grant of authority to the Legislature to act in an area of statewide concern, and therefore, controlled over the home rule taxing power of charter cities. (228 Cal.App.3d at p. 945.) The court concluded that although the home rule power was limited, it was not repealed.

When considering the same objection in relation to the ERAF legislation that supports the claim in this appeal, the court in *Sasaki, supra*, 23 Cal.App.4th 1442, found that shifting property tax revenues away from local governments did not result in impermissible infringement on the home rule powers. (*Id.* at p. 1457.) Neither the record in this case nor the ERAF legislation suggests that the Legislature has infringed upon the County's discretionary affairs so as to interfere with the rights of local residents to home rule. We agree with the analysis of the foregoing cases and reject the *1294 County's attempt to interpose home rule as a bar to budget allocation decisions.

Conclusion

The state is not obligated to reimburse local governments for the challenged change in allocation of property tax revenues among local entities. The reallocation of revenue resulting from the challenged legislation imposes no reimbursable cost on local governments and is neither a “new program” nor a “higher level of service” within the meaning of the Constitution. The Legislature is the proper forum to address those perceived inequities and to seek fiscal relief. The judgment of the superior court is reversed and remanded with instructions to enter a new judgment denying the petition for writ of mandate. In the interests of justice each party should bear its own costs on appeal.

Strankman, P. J., and Swager, J., concurred.

A petition for a rehearing was denied December 19, 2000, and the opinion was modified to read as printed above. The petition of plaintiff and respondent and interveners and respondents for review by the Supreme Court was denied February 28, 2001. Kennard, J., and Baxter, J., were of the opinion that the petition should be granted. *1295

Footnotes

- 1 The challenged legislation added [Revenue and Taxation Code section 97.03](#) (as enacted by Stats. 1992, ch. 699, § 12, p. 3093 and ch. 700, § 4, p. 3120, now [Rev. & Tax. Code, §§ 97.2 and 97.3](#), see *id.*, § 97.2, subd. (f)) and [Education Code section 41204.5](#) (ERAF expenditures deemed to have been in effect in 1986-1987 fiscal year for purposes of the calculation of the percentage of General Fund revenues appropriated toward minimum educational funding that year).
- 2 Section 6 provides: “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service, except that the Legislature may, but need not, provide such subvention of funds for the following mandates: [¶] (a) Legislative mandates requested by the local agency affected; [¶] (b) Legislation defining a new crime or changing an existing definition of a crime; or [¶] (c) Legislative mandates enacted prior to January 1, 1975, or executive orders or regulations initially implementing legislation enacted prior to January 1, 1975.”
- 3 Former Revenue and Taxation Code section 97.03, enacted in 1992, is now located in [Revenue and Taxation Code sections 97.2 and 97.3](#). (Stats. 1992, ch. 699, § 12, p. 3093; Stats. 1992, ch. 700, § 4, p. 3120; see Historical and Statutory Notes, 59 West's Ann. Rev. & Tax. Code (1998 ed.) foll. former §§ 97.01 to 97.05, p. 174.) [Revenue and Taxation Code section 97.2](#) provides: “Notwithstanding any other provision of this chapter, the computations and allocations made by each county pursuant to Section 96.1 or its predecessor section shall be modified for the 1992-93 fiscal year pursuant to subdivisions (a) to (d), inclusive, and for the 1997-98 and 1998-99 fiscal years pursuant to subdivision (e), as follows: [¶] (a)(1) Except as provided in paragraph (2), the amount of property tax revenue deemed allocated in the prior fiscal year to each county shall be reduced by the dollar amounts indicated as follows, multiplied by 0.953649: [list of dollar amounts for the 58 California counties] [¶] ... [¶] (d)(1) The amount of property tax revenues not allocated to the county, cities within the county, and special districts as a result of the reductions calculated pursuant to subdivisions (a), (b), and (c) shall instead be deposited in the Educational Revenue Augmentation Fund to be established in each county. The amount of revenue in the Educational Revenue Augmentation Fund, derived from whatever source, shall be allocated pursuant to paragraphs (2) and (3) to school districts and county offices of education, in total, and to community college districts, in total, in the same proportion that property tax revenues were distributed to school districts and county offices of education, in total, and community college districts, in total, during the 1991-92 fiscal year.”
- 4 Education Code former section 41204.5 stated that: “for the 1992-1993 fiscal year and each fiscal year thereafter, the percentage of 'General Fund revenues appropriated for school districts and community college districts, respectively, in fiscal year 1986-1987,' for purposes of paragraph (1) of subdivision (b) of [Section 8 of article XVI of the California Constitution](#), shall be deemed to be the percentage of General Fund revenues that would have been appropriated for those entities if the [1992 amendments to the Revenue and Taxation Code] ... had been operative for the 1986-87 fiscal year.”
- 5 “The Constitution of 1849 directed the Legislature to 'provide for a system of common schools, by which a school shall be kept up and supported in each district' (Cal. Const. of 1849, art. IX, § 3.) That constitutional command, with the additional proviso that the school maintained by each district be 'free,' has persisted to the present day. (Cal. Const., art. IX, § 5.) [¶] In furtherance of the State system of free public education, the Constitution also ... establishes a State School Fund” (*Butt v. State of California* (1992) 4 Cal.4th 668, 680 [15 Cal.Rptr.2d 480, 842 P.2d 1240].)

Article XVI, section 8 of the California Constitution provides for the State School Fund as follows: "From all state revenues there shall first be set apart the moneys to be applied by the State for support of the public school system and public institutions of higher education." (Cal. Const., art. XVI, § 8, subd. (a).)

6 State aid was in two forms: basic aid, consisting of a flat dollar amount per pupil; and equalization aid, which was distributed in inverse proportion to the wealth of the district. (*Serrano v. Priest* (1976) 18 Cal.3d 728, 739 [135 Cal.Rptr. 345, 557 P.2d 929] (*Serrano II*).

7 The use of revenue allocation funds as revenue spreading mechanisms is not confined to the ERAF's at issue in this case. In the wake of Proposition 13, the Legislature created other special allocation funds, for example, the Special District Augmentation Fund to share funds among special districts within counties. (*American River Fire Protection Dist. v. Board of Supervisors* (1989) 211 Cal.App.3d 1076 [259 Cal.Rptr. 858]; see also Gov. Code, §§ 30054, 30055 [Public Safety Augmentation Fund].)

8 As explained by the Legislative Analyst, California Constitution, article XVI, section 8, approved by the voters in 1988 as Proposition 98, "[e]stablishes a minimum level of funding for public schools and community colleges. [¶] [and] [r]equires the state to spend any excess revenues, up to a specified maximum, for public schools and community colleges." (Ballot Pamp., Gen. Elec. (Nov. 8, 1988) p. 78.) The minimum level is established by use of one of three formulas, the first of which references the percentage of General Fund revenues appropriated to schools in fiscal year 1986-1987.

9 As stated in the Governor's Budget Summary for 1993-1994, the state's response to Proposition 13 had included state assumption of approximately \$1.3 billion of the county health and welfare expenses and a shift of approximately \$800 million of local property tax revenue from school funding to cities, counties, and special districts. Allocations to schools were decreased, and the state assumed a larger proportion of responsibility for funding schools. Prior to Proposition 13, 53 percent of local property taxes went to schools. In 1991-1992, only 35 percent went to the schools. (Governor's Budget Summary, 1993-1994, p. 43.)

10 After briefing was complete in this case, but prior to oral argument, the Third District issued its opinion in *City of El Monte v. Commission on State Mandates* (2000) 83 Cal.App.4th 266 [99 Cal.Rptr.2d 333] (*City of El Monte*), in which a redevelopment agency sought reimbursement for a statute that required the agency to make payments to an ERAF. The court denied reimbursement, for the dual reasons that the agency was not required to expend tax revenues and the court's view that the transfer of costs was from one local entity to another, not from the state to local government.

11 Government Code section 17521 defines a test claim as: "the first claim, including claims joined or consolidated with the first claim, filed with the commission alleging that a particular statute or executive order imposes costs mandated by the state."

12 The challenged statutes were listed as Revenue and Taxation Code sections 95 et seq., 95.1 et seq., 97.01 et seq., 97.03, 97.035, 97.038 and Education Code section 41204.5.

13 We granted leave for the following organizations to file briefs as amici curiae: the Commission on State Mandates, in support of appellant, and 95 California cities, the Howard Jarvis Taxpayers Association, the California Special Districts Association, California Association of Recreation and Park Districts, California Association of Public Cemeteries, and the Mosquito and Vector Control Association of California, in support of respondent.

14 All constitutional issues preserved by language in the prayer accompanying the first cause of action are discussed.

15 Difficult fiscal decisions have always occupied government policy makers. In 1560, after the Abbey Church of St. Peter, Westminster joined the London Diocese, many of its assets were appropriated to repair St. Paul's Cathedral. An ecclesiastical commentator, complaining about the funding decision, declared that it was not desirable to rob St. Peter's altar in order to build one to St. Paul, soon popularized as robbing Peter to pay Paul. (Brewer, Dict. of Phrase and Fable (1898) <<http://www.bartleby.com/81/14383.html>> [as of Nov. 9, 2000].)

16 Proposition 4 excepted mandates enacted prior to January 1, 1975, from the subvention provision. (Cal. Const., art. XIII B, § 6, subd. (c).)

17 We are not alone in this conclusion. In *City of El Monte*, *supra*, 83 Cal.App.4th 266, the court rejected a similar claim for subvention brought by a special district, finding that allocating revenues among local entities did not amount to a reimbursable state mandate.

18 "Fewer still would deny that financing the public educational system in this state is Byzantine in its intricacy and complexity." (*Hayes*, *supra*, 5 Cal.App.4th at p. 1525.)

19 Cases that rejected claims of reimbursement similarly did not focus on shifting allocations in joint programs. In *City of Sacramento*, *supra*, 50 Cal.3d 51, the court merely determined that legislation extending unemployment insurance coverage to local government employees was not unique to local government and did not come within section 6. Similarly, in *County of Los Angeles*, *supra*, 43 Cal.3d 46, the court found that extension of workers' compensation benefits to government employees was not unique to government and not covered by section 6. In *County of Fresno*, *supra*, 53 Cal.3d 482, the court stated that reimbursement is not required where a local agency has authority to levy assessments sufficient to pay for the program. *City*

of *San Jose*, *supra*, 45 Cal.App.4th 1802 involved a city's claim for reimbursement for fees charged by counties for booking city arrestees into county jail. If anything, this case supports the Commission's decision because reimbursement was refused for an allocation among the counties, rather than for a state funded program. (*Id.* at p. 1812; see also *City of El Monte*, *supra*, 83 Cal.App.4th 266 [*City of San Jose* denied subvention for shifting of funds among local entities].)

20 Education Code section 41204.5 deems the words “percentage of General Fund revenues appropriated for school districts ... in fiscal year 1986-87” for purposes of the first test of Proposition 98's minimum funding provisions to be calculated as though the ERAF legislation had been in effect in the 1986-1987 fiscal year. This provision has the consequence of decreasing the amount the state contributes towards the minimum school funding guarantee.

21 Section 8 of article XVI provides the following three tests: “(b) Commencing with the 1990-91 fiscal year, the moneys to be applied by the State for the support of school districts and community college districts shall be not less than the greater of the following amounts: [¶] (1) The amount which, as a percentage of General Fund revenues which may be appropriated pursuant to Article XIII B, equals the percentage of General Fund revenues appropriated for school districts and community college districts, respectively, in fiscal year 1986-87. [¶] (2) The amount required to ensure that the total allocations to school districts and community college districts from General Fund proceeds of taxes appropriated pursuant to Article XIII B and allocated local proceeds of taxes shall not be less than the total amount from these sources in the prior fiscal year, excluding any revenues allocated pursuant to subdivision (a) of Section 8.5, adjusted for changes in enrollment and adjusted for the change in the cost of living pursuant to paragraph (1) of subdivision (e) of Section 8 of Article XIII B. This paragraph shall be operative only in a fiscal year in which the percentage growth in California per capita personal income is less than or equal to the percentage growth in per capita General Fund revenues plus one half of one percent. [¶] (3)(A) The amount required to ensure that the total allocations to school districts and community college districts from General Fund proceeds of taxes appropriated pursuant to Article XIII B and allocated local proceeds of taxes shall equal the total amount from these sources in the prior fiscal year, excluding any revenues allocated pursuant to subdivision (a) of Section 8.5, adjusted for changes in enrollment and adjusted for the change in per capita General Fund revenues.” (Cal. Const., art. XVI, § 8, subd. (b).)

22 The Counties referenced home rule, while the amicus curiae brief submitted by numerous California cities expanded on the origins and nature of home rule.

ATTACHMENT 28

135 Cal.App.4th 1377
Court of Appeal, Fourth District, Division 2, California.

CITY OF RANCHO CUCAMONGA, Plaintiff and Appellant,

v.

REGIONAL WATER QUALITY CONTROL BOARD–SANTA ANA REGION et al., Defendants and Respondents;
County of San Bernardino et al., Real Parties in Interest and Respondents.

No. E037079.

Jan. 26, 2006.

As Modified Feb. 27, 2006.

Synopsis

Background: Cities filed petitions for writs of mandate to challenge the procedure by which municipal storm sewer permit was issued by regional water quality control board, the conditions imposed by permit, and the expense of permit requirements. The Superior Court, San Bernardino County, No. RCV 071613, [Shahla Sabet, J.](#), sustained without leave to amend the demurrer of State Water Resources Control Board to entire action, sustained demurrer as to four causes of action and granted motion to strike of the regional board, and denied petition for writ of mandate. City appealed.

Holdings: The Court of Appeal, [Gaut, J.](#), held that:

- [1] State Water Resources Control Board was not a proper party in lawsuit;
- [2] regional water quality control board could move to strike less than all causes of action;
- [3] substantial evidence supported regional water quality control board's findings in issuing permit; and
- [4] permit requirements were not overly prescriptive.

Affirmed.

West Headnotes (11)

[1] **Environmental Law** 🔑 Parties

State Water Resources Control Board (State Board) was not a proper party in lawsuit filed by two cities against State Board and Regional Water Quality Control Board, challenging the procedure by which municipal storm sewer permit was adopted, the conditions imposed by permit, and the expense of permit requirements; permit was issued by regional board rather than state board, allegations failed to articulate any improper State Board conduct, and, challenge was barred by statute of limitations. [West's Ann.Cal.Gov.Code § 11350](#); [West's Ann.Cal.Water Code § 13330](#).

[4 Cases that cite this headnote](#)

[2] Mandamus 🔑 [Presumptions and burden of proof](#)

In exercising its independent judgment in deciding a petition for writ of mandate, a trial court must afford a strong presumption of correctness concerning administrative findings; since the trial court ultimately must exercise its own independent judgment, that court is free to substitute its own findings after first giving due respect to the agency's findings.

[Cases that cite this headnote](#)

[3] Mandamus 🔑 [Scope and extent in general](#)

On appeal from the trial court's decision on a petition for writ of mandate, the reviewing court determines whether substantial evidence supports the trial court's factual determinations.

[5 Cases that cite this headnote](#)

[4] Mandamus 🔑 [Scope and extent in general](#)

On appeal from the trial court's decision on a petition for writ of mandate, the trial court's legal determinations receive a de novo review with consideration being given to the agency's interpretations of its own statutes and regulations.

[4 Cases that cite this headnote](#)

[5] Environmental Law 🔑 [Preservation of error in administrative proceeding](#)

In city's challenge to procedure by which municipal storm sewer permit was adopted, to conditions imposed by permit, and to expense of permit requirements, city waived its objections to the administrative record, and to specific pieces of evidence, by not making such objections before or at the time of the administrative hearing; city was given notice that the hearing on the permit would proceed as an informal administrative adjudication, and it could not claim that it was relieved of the obligation to object to the administrative record at the time of the hearing. [West's Ann.Cal.Gov.Code § 11445.10 et seq.](#)

[1 Cases that cite this headnote](#)

[6] Administrative Law and Procedure 🔑 [Quasi-judicial](#)

The exercise of discretion to grant or deny a license, permit, or other type of application is a quasi-judicial function.

[Cases that cite this headnote](#)

[7] Environmental Law 🔑 [Pleading, petition, or application](#)

Defendant regional water quality control board could move to strike less than all causes of action filed in suit cities to challenge the procedure by which municipal storm sewer permit was adopted, the conditions imposed by permit, and the expense of permit requirements, inasmuch as trial court had authority to strike only part of pleading. [West's Ann.Cal.C.C.P. §§ 431.10, 436.](#)

[1 Cases that cite this headnote](#)

[8] Environmental Law 🔑 [Weight and sufficiency](#)

Substantial evidence supported regional water quality control board's findings in issuing municipal storm sewer permit; board adopted recommendations of its staff, which were based on previous permits and other reports, and which established that board did not simply copy similar permit for other counties.

[2 Cases that cite this headnote](#)

[9] Administrative Law and Procedure 🔑 [Decision](#)

Administrative Law and Procedure 🔑 [Substantial evidence](#)

An agency may rely upon the opinion of its staff in reaching decisions, and the opinion of staff may constitute substantial evidence.

[2 Cases that cite this headnote](#)

[10] Environmental Law 🔑 [Conditions and limitations](#)

Municipal storm sewer permit issued by regional water quality control board did not violate Clean Water Act by failing to include "safe harbor" provisions providing that, if permittee was in full compliance with permit conditions, it could not be found in violation of Clean Water Act; there was no statutory right to a "safe harbor" provision to be included as a term of the permit, and, in any event, such protection was already included in the Act. Clean Water Act, § 402(k), 33 U.S.C.A. § 1342(k).

[2 Cases that cite this headnote](#)

[11] Environmental Law 🔑 [Conditions and limitations](#)

Requirements contained in municipal storm sewer permit issued by regional water quality control board were not overly prescriptive and did not illegally dictate the manner of compliance; the federal Clean Water Act authorized imposition of permit conditions, and the permitting agency had discretion to decide what practices, techniques, methods, and other provisions were appropriate and necessary to control the discharge of pollutants. Clean Water Act, § 402(p)(3)(B)(iii), 33 U.S.C.A. § 1342(p)(3)(B)(iii).

See 12 Witkin, Summary of Cal. Law (10th ed. 2005) Real Property, §§ 892-896; Cal. Jur. 3d, Pollution and Conservation Laws, § 124 et seq.

[5 Cases that cite this headnote](#)

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***1379** OPINION

GAUT, J.

1. *Introduction*

This case involves environmental regulation of municipal storm sewers that carry excess water runoff to the Santa Ana River as it passes through San Bernardino County on its way to the Pacific Ocean. Federal and state laws impose regulatory controls on storm sewer discharges. Municipalities are required to obtain and comply with a federal regulatory permit limiting the quantity and quality of water runoff that can be discharged from these storm sewer systems.

In this instance, the Regional Water Quality Control Board for the Santa Ana Region (the Regional Board) conducted public hearings and then issued a comprehensive 66–page municipal storm sewer permit governing 18 local ***1380** public entities. Two permittees, the City of Rancho Cucamonga and the City of Upland, among others, filed an administrative appeal with the State Water Resources Control Board (the State Board.) The State Board summarily dismissed the appeal. The Cities of Rancho Cucamonga and Upland¹ then filed a petition for writ of mandate and complaint against the State Board and the Regional Board.

The trial court sustained without leave to amend the demurrer of the State Board to the entire action. It sustained the demurrer as to four causes of action and granted the motion to strike of the Regional Board. After a hearing, the trial court denied the petition for writ of mandate.

Both procedurally and substantively, the City of Rancho Cucamonga challenges the conditions imposed by the NPDES² Permit and Waste Discharge Requirements (the 2002 permit). It contends the procedure by which the 2002 permit was adopted was not legal, that the 2002 permit's conditions are not appropriate for the area, and that the permit's requirements are too expensive. Because we conclude the permit was properly adopted and its conditions and requirements are appropriate, we reject these contentions.

2. *The National Pollutant Discharge Elimination System*

California cases have repeatedly explained the complicated web of federal and state laws and regulations concerning water pollution, especially storm sewer discharge into the public waterways. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 619–621, 26 Cal.Rptr.3d 304, 108 P.3d 862 (*Burbank*); *Building Industry Assn. of San Diego County v. State Water Resources Control Board* (2004) 124 Cal.App.4th 866, 872–875, 22 Cal.Rptr.3d 128 (*Building Industry*); *Communities for a Better Environment v. State Water Resources Control Board* (2003) 109 Cal.App.4th 1089, 1092–1094, 1 Cal.Rptr.3d 76 (*Communities*); ****453** *WaterKeepers Northern California v. State Water Resources Control Board* (2002) 102 Cal.App.4th 1448, 1451–1453, 126 Cal.Rptr.2d 389 (*WaterKeepers*)).

For purposes of this case, the important point is described by the California Supreme Court in *Burbank*: “Part of the federal Clean Water Act [33 U.S.C. § 1251 et seq.] is the National Pollutant Discharge Elimination System (NPDES), ‘[t]he primary means’ for enforcing effluent limitations and standards under the Clean Water Act. ***1381** (*Arkansas v. Oklahoma* [(1992) 503 U.S. 91, 101, 112 S.Ct. 1046, 117 L.Ed.2d 239.]) The NPDES sets out the conditions under which the federal EPA or a state with an approved water quality control program can issue permits for the discharge of pollutants in wastewater. (33 U.S.C. § 1342(a) & (b).) In California, wastewater discharge requirements established by

the regional boards are the equivalent of the NPDES permits required by federal law. (§ 13374.)” (*Burbank, supra*, 35 Cal.4th at p. 621, 26 Cal.Rptr.3d 304, 108 P.3d 862.)

California's Porter–Cologne Act (*Wat.Code*, § 13000 et seq.) establishes a statewide program for water quality control. Nine regional boards, overseen by the State Board, administer the program in their respective regions. (*Wat.Code*, §§ 13140, 13200 et seq., 13240, and 13301.) *Water Code* sections 13374 and 13377 authorize the Regional Board to issue federal NPDES permits for five-year periods. (33 U.S.C. § 1342, subd. (b)(1)(B).)

As discussed more fully in part 6 below, the state-issued NPDES permits are subject to the informal hearing procedures set forth for administrative adjudications. (*Gov.Code*, § 11445.10 et seq.; *Cal.Code Regs.*, tit. 23, § 647 et seq.) The issuance of permits is specifically excluded from the procedures for administrative regulations and rulemaking. (*Gov.Code*, §§ 11340 et seq., 11352.)

3. *Factual and Procedural Background*

The Regional Board issued the first NPDES permit for San Bernardino County in 1990. The principal permittee was the San Bernardino Flood Control District (the District). The 1990 permit required the permittees to develop and implement pollution control measures, using “best management practices” and monitoring programs, to eliminate illegal discharges and connections, and to obtain any necessary legal authority to do so. The management programs could be existing or new.

In 1993, the District developed the NPDES Drain Area Management Program (DAMP).

The second NPDES permit was issued in 1996 and was based on the Report of Waste Discharge (ROWD) prepared by the principal permittee and co-permittees, including Rancho Cucamonga. The 1996 permit proposed extending the existing program, which included inspections of industrial and commercial sources; policies for development and redevelopment; better public education; and implementation of a monitoring program. It offered a commitment to reduce pollutants to the “maximum extent practicable.”

In 2000, the permittees submitted another ROWD to renew their NPDES permit. The 2000 ROWD proposed continuing to implement and develop water quality management and monitoring programs.

***1382** Based on the 2000 ROWD, the Regional Board staff created five successive drafts of the 2002 permit, incorporating written comments by Rancho Cucamonga and others and comments made during two public workshops. Some of the comments addressed the economic considerations of anticipated prohibitive compliance costs.

The notice of the public hearing to consider adoption of the 2002 permit hearing ****454** announced: “relevant Regional Board files are incorporated into the record;” the governing procedures were those for an informal hearing procedure as set forth in “Title 23, California Code of Regulations, Section 647 et seq.,” and “Hearings before the Regional Water Board are not conducted pursuant to *Government Code* section 11500 et seq.,” the alternative formal hearing procedure for administrative adjudication. The notice was mailed to all permittees. The accompanying “fact sheet,” which was publicly circulated, offered further information about the conduct and nature of the hearing and the legal and factual grounds for the Regional Board's recommendation to adopt the 2002 permit.

The informal public hearing was conducted on April 26, 2002. Neither Rancho Cucamonga nor any of the permittees objected to the form or substance of the hearing. Ultimately, after a staff presentation and testimony, including a statement from Rancho Cucamonga's counsel, the Regional Board adopted the 2002 permit. After the State Board dismissed their administrative appeal, Rancho Cucamonga and Upland filed the instant action.

The operative pleading is the second amended petition for writ of mandate and complaint. The petition alleges that the State Board and the Regional Board acted illegally and in excess of their jurisdiction in developing, adopting and implementing the 2002 permit. Based on 26 pages of general allegations, the petition asserts eight causes of action, alleging the State Board and the Regional Board violated [sections 13241, 13263, and 13360 of the Water Code](#) (the Porter–Cologne Act); the California Environmental Quality Act ([Pub. Resources Code, § 21000 et seq.](#)); the California Administrative Procedure Act ([Gov.Code, §§ 11340–11529](#)); the California Constitution; and the Federal Clean Water Act; and seeking declaratory and injunctive relief.

The State Board successfully opposed the action on demurrer. The Regional Board eliminated four causes of action, the fourth, fifth, seventh, and eighth by demurrer and motion to strike. On the remaining four causes of action, the trial court found in favor of the Regional Board.

***1383** 4. *State Board's Demurrer*

[1] Rancho Cucamonga maintains the trial court should not have sustained the demurrer of the State Board without leave to amend because the State Board is the ultimate authority on state-issued NPDES permits, and, therefore, was properly joined as a party: “Because the State Board has for all intents and purposes adopted the rules and policies of general application upon which the Permit is based, it is clearly a proper party to this action.”

The difficulty with Rancho Cucamonga's theory of liability against the State Board is, to quote Gertrude Stein about the City of Oakland, “There is no there there.” (Gertrude Stein, *Everybody's Autobiography*.) In other words, Rancho Cucamonga's allegations against the State Board lack any substance. Instead, Rancho Cucamonga launches an unspecific attack on the State Board without identifying any particular problems. The petition makes the unexceptional allegation that the State Board formulates general water control policy which it implements and enforces through regional boards. It also alleges the State Board has not complied with the Administrative Procedure Act but it does not identify any objectionable policies or how there is no compliance. Instead the petition complains about a State Board letter directing that all NPDES permits follow consistent principles regarding Standard Urban Storm Water Mitigation ****455** Plans. Additionally, the petition maintains the 2002 permit included new reporting requirements and increased costs of compliance.

But the foregoing allegations did not articulate any improper State Board conduct. The 2002 permit, issued by the Regional Board and not by the State Board, is not subject to formal rule-making procedures. ([Gov.Code, § 11352, subd. \(b\).](#)) The State Board's letter, explaining a precedential decision concerning mitigation plans, is not an example of formal rule-making. ([Gov.Code, § 11425.60, subd. \(b\).](#)) By dismissing Rancho Cucamonga's administrative appeal concerning the 2002 permit, the State Board declined to become involved and the Regional Board's decision to issue the permit became final and subject to judicial review. (*People ex rel Cal. Regional Wat. Quality Control Bd. v. Barry* (1987) 194 Cal.App.3d 158, 177, 239 Cal.Rptr. 349.) But the State Board was not made a proper party by reason of its dismissal of the administrative appeal.

Furthermore, even if Rancho Cucamonga had identified any cognizable claim against the State Board, it would have been barred by the 30–day statute of limitations for challenging an improperly adopted State Board regulation or order. ([Wat.Code, § 13330](#); [Gov.Code, § 11350](#).)

***1384** We hold the trial court properly sustained without leave to amend the State Board's demurrer to the second amended petition for writ of mandate and complaint.

5. Standard of Review for Petition for Writ of Mandate

[2] In deciding a petition for writ of mandate, the trial court exercises its independent judgment. (Code Civ. Proc., § 1094.5, subd. (c); Wat.Code, § 13330, subd. (d); *Building Industry, supra*, 124 Cal.App.4th at p. 879, 22 Cal.Rptr.3d 128.) But, “[i]n exercising its independent judgment, a trial court must afford a strong presumption of correctness concerning the administrative findings, ... Because the trial court ultimately must exercise its own independent judgment, that court is free to substitute its own findings after first giving due respect to the agency's findings.” (*Fukuda v. City of Angels* (1999) 20 Cal.4th 805, 817–818, 85 Cal.Rptr.2d 696, 977 P.2d 693 (*Fukuda*).)

[3] [4] On appeal, the reviewing court determines whether substantial evidence supports the trial court's factual determinations. (*Fukuda, supra*, 20 Cal.4th at p. 824, 85 Cal.Rptr.2d 696, 977 P.2d 693; *Building Industry, supra*, 124 Cal.App.4th at p. 879, 22 Cal.Rptr.3d 128.) The trial court's legal determinations receive a de novo review with consideration being given to the agency's interpretations of its own statutes and regulations. (*Building Industry, supra*, at p. 879, 22 Cal.Rptr.3d 128; *Nasha L.L.C. v. City of Los Angeles* (2004) 125 Cal.App.4th 470, 482, 22 Cal.Rptr.3d 772.)

6. Rancho Cucamonga's Objections to the Administrative Record and Lack of Notice

[5] The notice of the administrative hearing for adoption of the 2002 permit included the statement that the Regional Board's files would be incorporated as part of the record. Before trial on the writ petition, Rancho Cucamonga attempted to raise an omnibus objection to the entire administrative record and a specific objection to four documents, three studies about marine pollution and one economic study. The trial court ruled the objections had been waived by not making them before or at the time of the hearing. Applying the presumption of administrative regularity, we affirm the trial court's evidentiary ruling. (*Mason v. Office of Administrative Hearings* (2001) 89 Cal.App.4th 1119, 1131, 108 Cal.Rptr.2d 102.)

The reasons given by Rancho Cucamonga as to why the trial court should have sustained its objections to all or part of the administrative record are that it did not waive its objections to the record because Rancho Cucamonga did not know the hearing was adjudicative; the Regional Board did not provide *1385 notice of an informal hearing (Gov.Code, § 11445.30); and Rancho Cucamonga never had an opportunity to object to the administrative record.

[6] As noted previously, Government Code section 11352, subdivision (b), makes the issuance of an NPDES permit exempt from the rulemaking procedures of the Administrative Procedure Act. Permit issuance is a quasi-judicial, not a quasi-legislative, rule-making proceeding: “The exercise of discretion to grant or deny a license, permit or other type of application is a quasi-judicial function.” (*Sommerfield v. Helmick* (1997) 57 Cal.App.4th 315, 320, 67 Cal.Rptr.2d 51; *City of Santee v. Superior Court* (1991) 228 Cal.App.3d 713, 718, 279 Cal.Rptr. 22.)

Instead, the Regional Board correctly followed the administrative adjudication procedures (Gov.Code, § 11445.10 et seq.) and the companion regulations at California Code of Regulations, Title 23, sections 647–648.8 for informal adjudicative public hearings. These procedures were announced in the notice of hearing which also stated that Government Code section 11500 et seq., governing formal administrative adjudication hearings, would not apply, thus satisfying Government Code section 11445.30 requiring notice of an informal hearing procedure. At the time of the hearing, Rancho Cucamonga did not object to the informal procedure. Rancho Cucamonga's effort to argue that federal notice requirements (40 C.F.R. § 124.8, subd. (b)(6)(ii) (2005)) should also have been followed fails because this involved a state-issued NPDES permit adopted according to California procedures.

Because Rancho Cucamonga was given notice that the hearing on the permit would proceed as an informal administrative adjudication, it cannot successfully argue it was relieved of the obligation to object to the administrative

record at the time of the hearing. An informal administrative adjudication contemplates liberality in the introduction of evidence. (Cal. Code Regs., tit. 23, §§ 648, subd. (d) and 648.5.1.) If Rancho Cucamonga wished to object to the informal hearing procedures, including the liberal introduction of evidence, it should have raised its objections as provided by statute and regulation before or at the time of the hearing (Gov.Code, §§ 11445.30, 11445.40, and 11445.50; Cal. Code Regs., tit. 23, § 648.7), not a year later in the subsequent civil proceeding.

7. Economic Considerations for Issuance of NPDES Permit

Rancho Cucamonga's next assignment of error is that the Regional Board failed to consider the economic impact of the requirements of the 2002 permit by not conducting a cost-benefit analysis. Rancho Cucamonga relies on the California Supreme Court's *Burbank* opinion, in which the court held: "When ... a regional board is considering whether to make the pollutant restrictions in a wastewater discharge permit *more stringent* than federal law *1386 requires, California law allows the board to take into account economic factors, including the wastewater discharger's cost of compliance." (*Burbank*, *supra*, 35 Cal.4th at p. 618, 26 Cal.Rptr.3d 304, 108 P.3d 862.) Rancho Cucamonga contends that the 2002 permit exceeds federal requirements and that, therefore, this case should be remanded for a consideration of **457 economic factors. (See *ibid.*; Wat.Code, § 13241, subd. (d).)

The two problems with this argument are the trial court found there was no evidence that the 2002 permit exceeded federal requirements and Rancho Cucamonga does not explain now how it does so. There was also evidence that the 2002 permit was based on a fiscal analysis and a cost-benefit analysis. In the absence of the foundational predicate and in view of evidence that cost was considered, Rancho Cucamonga's contention on this point fails.

[7] We also reject Rancho Cucamonga's related procedural argument that the Regional Board's motion to strike was impermissible as piecemeal adjudication. (*Regan Roofing v. Superior Court* (1994) 24 Cal.App.4th 425, 432–436, 29 Cal.Rptr.2d 413, *Lilienthal & Fowler v. Superior Court* (1993) 12 Cal.App.4th 1848, 1851–1855, 16 Cal.Rptr.2d 458.) It is well recognized a court may strike all or part of a pleading as it did in this instance. (Code Civ. Proc., §§ 431.10 and 436; *PH II, Inc. v. Superior Court* (1995) 33 Cal.App.4th 1680, 1682–1683, 40 Cal.Rptr.2d 169.)

8. Substantial Evidence

[8] Rancho Cucamonga also challenges the trial court's independent factual determination that sufficient evidence supports the findings of the Regional Board. Rancho Cucamonga's main contention is that the 2002 permit was not distinctively crafted for San Bernardino County but, instead, copied a similar permit for other counties without identifying any particular water quality impairment in San Bernardino County caused by the permittees. In other words, no evidence in the record supports issuance of the 2002 permit and the trial court did not identify any such evidence in its statement of decision.

One problem with Rancho Cucamonga's foregoing argument is that the Clean Water Act requires an NPDES permit to be issued for *any* storm sewer discharge, whether there is any actual impairment in a particular region. (33 U.S.C. § 1342; *Communities*, *supra*, 109 Cal.App.4th at pp. 1092–1093, 1 Cal.Rptr.3d 76.) Therefore, Rancho Cucamonga's contention that the permit fails to identify impaired water bodies in the region is beside the point.

In its statement of decision, the trial court discussed the inadequacy of the arguments and evidence cited by Rancho Cucamonga and concluded: "The San Bernardino Permit is based in part on the Basin Plan for this region. It is *1387 also based on the permittees' own reports and monitoring within this region.... It incorporates the permittees' management program, which is unique to these cities and county." The trial court included a citation to the 1993

DAMP report's "Geographic Description of the Drainage Area," which discusses the specific conditions present in San Bernardino County.

On appeal, Rancho Cucamonga faults the trial court for not presenting a more detailed description of the evidence supporting the issuance of the permit. We do not think the trial court, or this court, must bear that burden.

[9] First, "[a]n agency may ... rely upon the opinion of its staff in reaching decisions, and the opinion of staff has been recognized as constituting substantial evidence. (*Coastal Southwest Dev. Corp. v. California Coastal Zone Conservation Com.* (1976) 55 Cal.App.3d 525, 535–536, 127 Cal.Rptr. 775.)" (*Browning–Ferris Industries v. City Council* (1986) 181 Cal.App.3d 852, 866, 226 Cal.Rptr. 575.) Here the Regional Board adopted the recommendation of its staff in issuing the permit. And, as the record shows, the staff's recommendation was based on the previous 1990 and 1996 permits, the 1993 DAMP **458 report and the 2000 ROWD, the permittees' application for renewal of the 1996 permit, as well as more general water quality factors. The evidence contradicts Rancho Cucamonga's assertion, that "the Regional Board simply copied verbatim the NPDES Permit for North Orange County, a coastal region with markedly different water quality conditions and problems."

As part of the trial court's consideration of the petition for writ of mandate, Rancho Cucamonga and the Regional Board directed the court to review specific items of evidence contained in the administrative record. In its opposing brief, the Regional Board offered a detailed account of the evidence supporting the issuance of the permit. The trial court indicated it had reviewed the parties' submissions before ruling. It discussed the evidence at the hearing on the petition and referred to it in its statement of decision. (*Lala v. Maiorana* (1959) 166 Cal.App.2d 724, 731, 333 P.2d 862.) Rancho Cucamonga had the burden of showing the Board abused its discretion or its findings were not supported by the facts. (*Building Industry, supra*, 124 Cal.App.4th at pp. 887–888, 22 Cal.Rptr.3d 128.) To the extent it attempted to do so at the trial court level, it was not successful.

This court has independently reviewed the record with particular attention to the evidence as emphasized by the parties. We do not, however, find it incumbent upon us or the trial court to review the many thousands of pages submitted on appeal and identify the particular evidence that constitutes substantial evidence. Instead, we deem the trial court's findings sufficient and not affording any grounds for reversal. (*Building Industry, supra*, 124 Cal.App.4th at p. 888, 22 Cal.Rptr.3d 128; see *Weisz Trucking Co., Inc. v. Emil R. Wohl *1388 Construction* (1970) 13 Cal.App.3d 256, 264, 91 Cal.Rptr. 489, citing *Perry v. Jacobsen* (1960) 184 Cal.App.2d 43, 50, 7 Cal.Rptr. 177.)

9. Safe Harbor Provision

[10] As it did repeatedly below, Rancho Cucamonga maintains the 2002 permit violates section 402(k) of the Clean Water Act (33 U.S.C. § 1342, subd. (k)), because the permit does not include "safe harbor" language, providing that, if a permittee is in full compliance with the terms and conditions of its permit, it cannot be found in violation of the Clean Water Act. (*United States Public Interest Research Group v. Atlantic Salmon of Maine, LLC* (1st Cir.2003) 339 F.3d 23, 26; *EPA v. State Water Resources Control Bd.* (1976) 426 U.S. 200, 205, 96 S.Ct. 2022, 48 L.Ed.2d 578.) The trial court found there was no statutory right to a "safe harbor" provision to be included as the term of the permit. We agree.

This seems like much ado about nothing because 33 U.S.C. § 1342, subdivision (k), already affords Rancho Cucamonga the protection it seeks: "Compliance with a permit issued pursuant to this section shall be deemed compliance, for purposes of sections 1319 and 1365 of this title, with sections 1311, 1312, 1316, 1317, and 1343 of this title, except any standard imposed under section 1317 of this title for a toxic pollutant injurious to human health." Rancho Cucamonga does not cite any persuasive authority as to why this statutory protection had to be duplicated as a provision in the 2002 permit.

Furthermore, the 2002 permit complied with the State Board's Water Quality Order No. 99-05, a precedential decision requiring NPDES permits to omit "safe harbor" language used in earlier permits. A permit without "safe harbor" language was upheld in ****459** *Building Industry, supra*, 124 Cal.App.4th at p. 877, 22 Cal.Rptr.3d 128. The trial court did not err.

10. *Maximum Extent Practicable*

Rancho Cucamonga protests that the 2002 permit's discharge limitations/prohibitions exceed the federal requirement that storm water dischargers should "reduce the discharge of pollutants to the maximum extent practicable." (33 U.S.C. § 1342, subd. (p)(3)(B)(iii).) The trial court, however, found there was no evidence presented that the 2002 permit exceeded federal requirements. Because there is no evidence, the issue presented is hypothetical and, therefore, premature. (*Building Industry, supra*, 124 Cal.App.4th at p. 890, 22 Cal.Rptr.3d 128.)

Additionally, as Rancho Cucamonga recognizes, *Building Industry* rejected the contention that a "regulatory permit violates federal law because it allows the Water Boards to impose municipal storm sewer control measures more ***1389** stringent than a federal standard known as 'maximum extent practicable.' [Citation.] [Fn. omitted.] [W]e ... conclude the Water Boards had the authority to include a permit provision requiring compliance with state water quality standards." (*Building Industry, supra*, 124 Cal.App.4th at p. 871, 22 Cal.Rptr.3d 128.) The *Burbank* case, allowing for consideration of economic factors when federal standards are exceeded, does not alter the analysis in this case where there was no showing that federal standards were exceeded and where there was evidence that economic factors were considered. Furthermore, like the permit in *Building Industry*, the 2002 permit contemplates controlling discharge of pollutants to the maximum extent practicable through a "cooperative iterative process where the Regional Water Board and Municipality work together to identify violations of water quality standards." (*Building, supra*, at p. 889, 22 Cal.Rptr.3d 128.) The 2002 permit does not exceed the maximum extent practicable standard.

11. *The Requirements of the 2002 Permit*

[11] Rancho Cucamonga lastly complains the requirements of the 2002 permit are "overly prescriptive," illegally dictating the manner of compliance and improperly delegating to the permittees the inspection duties of the State Board and the Regional Board. Rancho Cucamonga's arguments contradict the meaning and spirit of the Clean Water Act.

In creating a permit system for dischargers from municipal storm sewers, Congress intended to implement actual programs. (*Natural Resources Defense Council, Inc. v. Costle* (D.C.Cir.1977) 568 F.2d 1369, 1375.) The Clean Water Act authorizes the imposition of permit conditions, including: "management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator of the State determines appropriate for the control of such pollutants." (33 U.S.C. § 1342, subd. (p)(3)(B)(iii).) The Act authorizes states to issue permits with conditions necessary to carry out its provisions. (33 U.S.C. § 1342, subd. (a)(1).) The permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants. (*NRDC v. EPA* (9th Cir.1992) 966 F.2d 1292, 1308.) That is what the Regional Board has created in the 2002 permit.

Rancho Cucamonga's reliance on [Water Code section 13360](#) is misplaced because that code section involves enforcement and implementation of state water quality law, ([Wat.Code, § 13300 et seq.](#)) not compliance with the Clean Water Act ([Wat.Code, § 13370 et seq.](#)) The federal law ****460** preempts the state law. (*Burbank, supra*, 35 Cal.4th at p. 626, 26 Cal.Rptr.3d 304, 108 P.3d 862.) The Regional Board must comply with federal law requiring detailed conditions for NPDES permits.

*1390 Furthermore, the 2002 permit does afford the permittees discretion in the manner of compliance. It is the permittees who design programs for compliance, implementing best management practices selected by the permittees in the DAMP report and approved by the Regional Board. Throughout the permit, the permittees are granted considerable autonomy and responsibility in maintaining and enforcing the appropriate legal authority; inspecting and maintaining their storm drain systems according to criteria they develop; establishing the priorities for their own inspection requirements; and establishing programs for new development. The development and implementation of programs to control the discharge of pollutants is left largely to the permittees.

More particularly, we agree with the Regional Board that the permit properly allocated some inspection duties to the permittees. As part of their ROWD application for a permit, the permittees proposed to "Conduct Inspection, Surveillance, and Monitoring. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal storm drain system." The ROWD also discussed continuing existing inspection programs.

[Water Code section 13383](#) provides that as part of compliance with the Clean Water Act, the Regional Board may establish inspection requirements for any pollutant discharger. Federal law, either expressly or by implication, requires NPDES permittees to perform inspections for illicit discharge prevention and detection; landfills and other waste facilities; industrial facilities; construction sites; certifications of no discharge; non-stormwater discharges; permit compliance; and local ordinance compliance. (40 C.F.R. 122.26, subs. (d), (g); 33 U.S.C. § 1342, subd. (p)(3)(B)(ii).) Permittees must report annually on their inspection activities. (40 C.F.R. § 122.42, subd. (c)(6) (2005).)

Rancho Cucamonga claims it is being required to conduct inspections for facilities covered by other state-issued general permits. Rancho Cucamonga and the other permittees are responsible for inspecting construction and industrial sites and commercial facilities within their jurisdiction for compliance with and enforcement of local municipal ordinances and permits. But the Regional Board continues to be responsible under the 2002 NPDES permit for inspections under the general permits. The Regional Board may conduct its own inspections but permittees must still enforce their own laws at these sites. (40 C.F.R. § 122.26, subd. (d)(2) (2005).)

***1391** 12. *Disposition*

Rancho Cucamonga is the only of the original 18 permittees still objecting to the 2002 NPDES permit. It has not successfully demonstrated that substantial evidence does not support the trial court's factual determinations or the trial court erred in its interpretation and application of state and federal law.

We affirm the judgment and order the prevailing parties to recover their costs on appeal.

[HOLLENHORST](#), Acting P.J., and [RICHLI](#), J., concur.

All Citations

135 Cal.App.4th 1377, 38 Cal.Rptr.3d 450, 36 Env'tl. L. Rep. 20,026, 06 Cal. Daily Op. Serv. 845, 06 Cal. Daily Op. Serv. 1699, 2006 Daily Journal D.A.R. 1126

Footnotes

- 1 Upland is not a party to this appeal.
- 2 The National Pollutant Discharge Elimination System.

End of Document

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ATTACHMENT 29

30 Cal.4th 727, 68 P.3d 1203, 134 Cal.Rptr.2d 237, 176 Ed. Law Rep.
894, 03 Cal. Daily Op. Serv. 4288, 2003 Daily Journal D.A.R. 5463
Supreme Court of California

DEPARTMENT OF FINANCE, Plaintiff and Appellant,

v.

COMMISSION ON STATE MANDATES, Defendant and Respondent; KERN
HIGH SCHOOL DISTRICT et al., Real Parties in Interest and Respondents.

No. S109219.
May 22, 2003.

SUMMARY

The Department of Finance brought an administrative mandate proceeding against the Commission on State Mandates, challenging its decision that two statutes-requiring school site councils and advisory committees for certain educational programs to provide notice of meetings and to post agendas for those meetings-constituted a reimbursable state mandate under [Cal. Const., art. XIII B, § 6](#). The trial court denied the petition. (Superior Court of Sacramento County, No. 00CS00866, Ronald B. Robie, Judge.) The Court of Appeal, Third Dist., No. C037645, rejected the department's position, concluding that a state mandate is established when the local governmental entity has no reasonable alternative and no true choice but to participate in the program, and incurs the additional costs associated with an increased or higher level of service.

The Supreme Court reversed the judgment of the Court of Appeal. The court held that the statutes do not constitute a reimbursable state mandate. Thus, the claimants (two public school districts and a county) were not entitled to reimbursement. The claimants could not show that they were legally compelled to incur notice and agenda costs, and hence entitled to reimbursement from the state, based merely upon the circumstance that the notice and agenda provisions were mandatory elements of education-related programs in which the claimants participated, without regard to whether the claimants' participation was voluntary or compelled. If a school district elects to participate in any underlying voluntary education-related funded program, the obligation to comply with the notice and agenda requirements related to that program does not constitute a reimbursable state mandate. In this case, the claimants were not legally compelled to participate in eight of the nine underlying funded programs. Even if the claimants were legally compelled to participate in one of the nine programs, they were nevertheless not entitled to reimbursement from the state for such expenses, because they were free at all relevant times to use funds provided by the state for that program to pay required program expenses, including notice and agenda costs. The court further held that the claimants failed to show that they were compelled to participate in the underlying programs. Moreover, the costs associated with the notice and agenda requirements were modest, and nothing in the governing statutes or regulations suggested that a school district was precluded from using a portion of the program funds obtained from the state to pay associated notice and agenda costs. (Opinion by George, C. J., expressing the unanimous view of the court.)

HEADNOTES

Classified to California Digest of Official Reports

(1)

State of California § 11--Fiscal Matters--Reimbursable State Mandate-- School Programs--Statutory Requirements to Provide Notice and to Post Agenda of Meetings--Participation in Programs as Legally Compelled.

In proceedings to determine whether statutes, requiring school site councils and advisory committees for certain educational programs to provide notice of meetings and to post agendas for those meetings, were reimbursable mandates under [Cal. Const., art. XIII B, § 6](#), the Court of Appeal erred in concluding that the claimants (two public school districts and a county) were entitled to reimbursement. The claimants could not show that they were legally compelled to incur notice and agenda costs, and hence entitled to reimbursement from the state, based merely upon the circumstance that the notice and agenda provisions were mandatory elements of education-related programs in which the claimants participated, without regard to whether the claimants' participation was voluntary or compelled. If a school district elects to participate in any underlying voluntary education-related funded program, the obligation to comply with the notice and agenda requirements related to that program does not constitute a reimbursable state mandate. The proper focus under a legal compulsion inquiry is upon the nature of the claimants' participation in the underlying programs themselves. In this case, the claimants were not legally compelled to participate in eight of the nine underlying funded programs. Even if the claimants were legally compelled to participate in one of the nine programs, they were nevertheless not entitled to reimbursement from the state for such expenses, because they were free at all relevant times to use funds provided by the state for that program to pay required program expenses, including notice and agenda costs.

[See [9 Witkin, Summary of Cal. Law \(9th ed. 1989\) Taxation, § 123A](#); West's Key Number Digest, States  111.]

(2a, 2b, 2c)

State of California § 11--Fiscal Matters--Reimbursable State Mandate--School Programs--Statutory Requirements to Provide Notice and to Post Agenda of Meetings--Participation in Programs as Compelled--As Practical Matter.

In proceedings to determine whether statutes, requiring school site councils and advisory committees for certain educational programs to provide notice of meetings and to post agendas for those meetings, were reimbursable mandates under [Cal. Const., art. XIII B, § 6](#), in which claimants (two public school districts and a county) failed to show that they were legally compelled to participate in the underlying funded programs and incur notice and agenda costs, the claimants also failed to show that, as a practical matter, they were compelled to participate in the underlying programs. Although the claimants sought to show that they had no true choice other than to participate in the programs, and that the absence of a reasonable alternative to participation was a de facto mandate, they did not face penalties such as double taxation or other severe consequences for not participating, and hence they were not mandated under [Cal. Const., art. XIII, § 6](#), to incur increased costs. Moreover, the costs associated with the notice and agenda requirements were modest, and nothing in the governing statutes or regulations suggested that a school district was precluded from using a portion of the program funds obtained from the state to pay associated notice and agenda costs. The asserted compulsion stemmed only from the circumstance that the claimants found the benefits of various funded programs too beneficial to refuse. However, the state is not prohibited from providing school districts with funds for voluntary programs, and then effectively reducing that grant by requiring the districts to incur expenses in order to meet conditions of program participation.

(3)

Municipalities § 23--Powers--Relationship Between State and Local Governments.

Unlike the federal-state relationship, sovereignty is not an issue between state and local governments.

(4)

State of California § 11--Fiscal Matters--Reimbursable State Mandate-- Purpose.

The purpose of [Cal. Const., art. XIII B, § 6](#) (reimbursable state mandates), is to preclude the state from shifting financial responsibility for carrying out governmental functions to local agencies, which are ill equipped to assume increased financial responsibilities.

COUNSEL

Bill Lockyer, Attorney General, Andrea Lynn Hoch, Chief Assistant Attorney General, Manuel M. Medeiros and Louis R. Mauro, Assistant Attorneys General, Catherine M. Van Aken and Leslie R. Lopez, Deputy Attorneys General, for Plaintiff and Appellant.

Paul M. Starkey, Camille Shelton and Eric D. Feller for Defendant and Respondent.

Jo Anne Sawyerknoll, Jose A. Gonzales and Arthur M. Palkowitz for Real Party in Interest and Respondent San Diego Unified School District.

No appearance by Real Parties in Interest and Respondents Kern High School District and County of Santa Clara.

Ruth Sorensen for California State Association of Counties, City of Buenaventura, City of Carlsbad, City of Dixon, City of Indian Wells, City of La Habra Heights, City of Merced, City of Monterey, City of Plymouth, City and County of San Francisco, City of San Luis Obispo, City of San Pablo, City of Tracy and City of Walnut Creek as Amici Curiae on behalf of Real Parties in Interest and Respondents.

Diana McDonough, Harold M. Freiman, Cynthia A. Schwerin and Lozano Smith for California School Boards Association, through its Education Legal Alliance as Amici Curiae on behalf of Real Parties in Interest and Respondents.

GEORGE, C. J.

[Article XIII B, section 6, of the California Constitution](#) provides: “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service” (Hereafter [article XIII B, section 6](#).)

Real parties in interest—two public school districts and a county (hereafter claimants)—participate in various education-related programs that are funded by the state and, in some instances, by the federal government. Each of these underlying funded programs in turn requires participating public school districts to establish and utilize specified school councils and advisory committees. Statutory provisions enacted in the mid-1990's require that such school councils and advisory committees provide notice of meetings, and post agendas for those meetings. (See [Gov. Code, § 54952](#); [*731 Ed. Code, § 35147](#).) We granted review to determine whether claimants have a right to reimbursement from the state for their costs in complying with these statutory notice and agenda requirements.

We conclude, contrary to the Court of Appeal, that claimants are not entitled to reimbursement under the circumstances presented here. Our conclusion is based on the following determinations:

First, we reject claimants' assertion that they have been legally compelled to incur notice and agenda costs, and hence are entitled to reimbursement from the state, based merely upon the circumstance that the notice and agenda provisions are mandatory elements of education-related programs in which claimants have participated, without regard to whether a claimant's participation in the underlying program is voluntary or compelled. Second, we conclude that as to *eight* of the nine underlying funded programs here at issue, claimants have not been legally compelled to participate in those programs, and hence cannot establish a reimbursable state mandate as to those programs based upon a theory of legal compulsion. Third, assuming (without deciding) that claimants have been legally compelled to participate in *one* of the nine programs, we conclude that claimants nonetheless have no entitlement to reimbursement from the state for such expenses, because they have been free at all relevant times to use funds provided by the state for that program to pay required program expenses—including the notice and agenda costs here at issue.

Finally, we reject claimants' alternative contention that even if they have not been *legally* compelled to participate in the underlying funded programs, as a *practical* matter they have been compelled to do so and hence to incur notice and agenda-related costs. Although we do not foreclose the possibility that a reimbursable state mandate might be found in circumstances short of legal compulsion—for example, if the state were to impose a substantial penalty (independent of the program funds at issue) upon any local entity that declined to participate in a given program—claimants here faced no such practical compulsion. Instead, although claimants argue that they have had “no true option or choice” other than to participate in the underlying funded educational programs, the asserted compulsion in this case stems only from

the circumstance that claimants have found the benefits of various funded programs “too good to refuse”-even though, as a condition of program participation, they have been forced to incur some costs. On the facts presented, the cost of compliance with conditions of participation in these funded programs does not amount to a reimbursable state mandate.

Accordingly, we shall reverse the judgment of the Court of Appeal. *732

I.

A number of statutes establish various school-related educational programs, such as the School-Based Pupil Motivation and Maintenance Program and Dropout Recovery Act (Ed. Code, § 54720 et seq.), Programs to Encourage Parental Involvement (Ed. Code, § 11500 et seq.), and the federal Indian Education Program (20 U.S.C. § 7421 et seq. [former 25 U.S.C. § 2604 et seq.]). Under these statutes, participating school districts are granted state or federal funds to operate the program, and are required to establish school site councils or advisory committees that help administer the program. Program funding often is substantial-for example, on a statewide basis, funding provided by the state for school improvement programs (see Ed. Code, §§ 52010 et seq., 62000, 62000.2, subd. (b), 62002) for the 1998-1999 fiscal year totaled approximately \$394 million. (Cal. Dept. of Ed., Rep., Budget Act of 1998 (Nov. 1998) p. 52.)

In the mid-1990's, the Legislature passed legislation designed to make the operations of the councils and advisory committees related to such programs more open and accessible to the public. First, effective April 1, 1994, the Legislature enacted Government Code section 54952, which expanded the reach of the Ralph M. Brown Act (Brown Act) (Gov. Code, § 54950.5 et seq.)-California's general open meeting law-to apply to all such official local advisory bodies.¹ Second, effective July 21, 1994, Education Code section 35147 superceded Government Code section 54952, with respect to the application of the Brown Act to designated councils and advisory committees. Although the earlier (Government Code) statute had made *all* local government councils and advisory committees subject to *all* provisions of the Brown Act, the later (Education Code) statute generally exempts councils and advisory committees of nine specific programs from compliance with all provisions of the Brown Act, and imposes instead its own separately described requirement that all such councils and advisory committees related to those nine programs be open to the public, provide notice of meetings, and post meeting agendas.² *733

Compliance with these notice and agenda rules in turn imposed various costs on the affected councils and committees. Claimants Kern High School District, San Diego Unified School District, and County of Santa Clara filed “test claims” (see Gov. Code, § 17521) with the Commission on State Mandates (Commission), seeking reimbursement for the costs incurred by school councils and advisory committees in complying with the new statutory notice and agenda requirements. (See generally *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 331-333 [285 Cal.Rptr. 66, 814 P.2d 1308] [describing legislative procedures implementing art. XIII B, § 6].)³ In a statement of decision issued in mid-April 2002, the Commission found in favor of claimants. It concluded that the statutory notice and agenda requirements impose reimbursable state mandates for the costs of preparing meeting agendas, posting agendas, and providing the public an opportunity to address the respective council or committee. *734

Acting through the Department of Finance, the State of California (hereafter Department of Finance or Department) thereafter brought this administrative mandate proceeding under Government Code section 17559, subdivision (b), to challenge the Commission's decision. The San Diego Unified School District took the lead role on behalf of claimants; the Kern High School District and the County of Santa Clara did not appear in the court proceedings below and have not appeared in this court.

In November 2000, the trial court, agreeing with the Commission, denied the mandate petition.⁴ The Department of Finance appealed, arguing that the school councils and advisory committees at issue serve categorical aid programs in which school districts participate “voluntarily,” often as a condition of receiving state or federal program funds. The Department of Finance asserted that the state has not *compelled* school districts to participate in or accept funding for any

of those underlying programs-and hence has not required the establishment of any of the councils and committees that serve the programs. Instead, the Department of Finance argued, the state merely has set out reasonable conditions and rules that must be adhered to if a local entity elects to participate in a program and receive program funding. Accordingly, the Department of Finance asserted, because local entities are not required to undertake or continue to participate in the programs, the state, by enacting [Government Code section 54952](#) and [Education Code section 35147](#), has not imposed a “mandate,” as that term is used in [article XIII B, section 6](#). It follows, the Department of Finance asserted, that claimants have no right to reimbursement under [article XIII B, section 6](#).

In a July 2002 decision, the Court of Appeal rejected the position taken by the Department of Finance. The appellate court concluded that a state mandate is established under [article XIII B, section 6](#), when the local governmental entity has “no reasonable alternative” and “no true choice but to participate” in the program, and incurs the additional costs associated with an increased or higher level of service.⁵

We granted review to consider the Court of Appeal's construction of the term “state mandate” as it appears in [article XIII B, section 6](#). *735

II.

Article XIII A (adopted by the voters in 1978 as Proposition 13), limits the *taxing* authority of state and local government. [Article XIII B](#) (adopted by the voters in 1979 as Proposition 4) limits the *spending* authority of state and local government.

[Article XIII B, section 6](#), provides as follows: “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service, except that the Legislature may, but need not, provide such subvention of funds for the following mandates: [¶] (a) Legislative mandates requested by the local agency affected; [¶] (b) Legislation defining a new crime or changing an existing definition of a crime; or [¶] (c) Legislative mandates enacted prior to January 1, 1975, or executive orders or regulations initially implementing legislation enacted prior to January 1, 1975.” [Article XIII B](#) became operative on July 1, 1980. (*Id.*, § 10.)

We have observed that [article XIII B, section 6](#), “recognizes that [articles XIII A](#) and [XIII B](#) severely restrict the taxing and spending powers of local governments. [Citation.] Its purpose is to preclude the state from shifting financial responsibility for carrying out governmental functions to local agencies, which are ‘ill equipped’ to assume increased financial responsibilities because of the taxing and spending limitations that [articles XIII A](#) and [XIII B](#) impose.” (*County of San Diego v. State of California* (1997) 15 Cal.4th 68, 81 [61 Cal.Rptr.2d 134, 931 P.2d 312] (*County of San Diego*)). We also have observed that a reimbursable state mandate does not arise merely because a local entity finds itself bearing an “additional cost” imposed by state law. (*County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 55-57 [233 Cal.Rptr. 38, 729 P.2d 202].) The additional expense incurred by a local agency or school district arising as an “incidental impact of a law which applied generally to all ... entities” is not the “type of expense ... [that] the voters had in mind when they adopted [section 6 of article XIII B](#).” (*Lucia Mar Unified School Dist. v. Honig* (1988) 44 Cal.3d 830, 835 [244 Cal.Rptr. 677, 750 P.2d 318]; see also *County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487 [280 Cal.Rptr. 92, 808 P.2d 235]; *City of Sacramento v. State of California* (1990) 50 Cal.3d 51, 70 [266 Cal.Rptr. 139, 785 P.2d 522] (*City of Sacramento*)).⁶)

The focus in many of the prior cases that have addressed [article XIII B, section 6](#), has been upon the meaning of the terms “new program” or *736 “increased level of service.” In the present case, we are concerned with the meaning of state “mandate.”

III.

A.

(11) In its briefs, the Department of Finance asserts that [article XIII B, section 6](#), reflects an intent on the part of the drafters and the electorate to limit reimbursement to costs that are forced upon local governments as a matter of legal compulsion. The Commission's briefs take a similar approach, arguing that reimbursement under the constitutional provision requires a showing that a local entity was "ordered or commanded" to incur added costs. At oral argument, both the Department and the Commission retreated somewhat from these positions, and suggested that legal compulsion may not be a necessary condition of a finding of a reimbursable state mandate in all circumstances. For the reasons explained below, although we shall analyze the legal compulsion issue, we find it unnecessary in this case to decide whether a finding of legal compulsion is *necessary* in order to establish a right to reimbursement under [article XIII B, section 6](#), because we conclude that even if there are some circumstances in which a state mandate may be found in the absence of legal compulsion, the circumstances presented in this case do not constitute such a mandate.

1.

The Department of Finance and the Commission maintain that the drafters of [article XIII B, section 6](#), borrowed that provision's basic idea and structure-and the gist of its "state mandate" language-from then existing statutes. (See generally *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1564, 1577-1581 [15 Cal.Rptr.2d 547].) At the time of the drafting and enactment of [article XIII B, section 6](#), former [Revenue and Taxation Code section 2231, subdivision \(a\)](#) (currently [Gov. Code, § 17561](#), subd. (a)) provided: "The state shall reimburse each local agency for all 'costs mandated by the state,' as defined in Section 2207...." And at that same time, former [Revenue and Taxation Code section 2207](#) (currently [Gov. Code, § 17514](#)) provided: "'Costs mandated by the state' means any increased costs which a local agency is required to incur as a result of the *737 following: [¶] (a) Any law enacted after January 1, 1973, which mandates a new program or an increased level of service of an existing program"

As the Department of Finance observes, we frequently have looked to ballot materials in order to inform our understanding of the terms of a measure enacted by the electorate. (See, e.g., *County of Fresno v. State of California*, [supra](#), 53 Cal.3d 482, 487 [reviewing ballot materials concerning [art. XIII B](#)].) The Department stresses that the ballot materials pertaining to [article XIII B](#) in two places suggested that a state mandate comprises something that a local government entity is required or forced to do. The Legislative Analyst stated: "'State mandates' are *requirements imposed* on local governments by legislation or executive orders." (Ballot Pamp., Special Statewide Elec. (Nov. 6, 1979) Prop. 4, p. 16, italics added.) Similarly, the measure's proponents stated that the provision would "not allow the state governments to *force* programs on local governments without the state paying for them." (*Id.*, arguments in favor of Prop. 4, p. 18, capitalization removed, italics added.) The Department concludes that the ballot materials fail to suggest that a reimbursable state mandate might be found to exist outside the context of legal compulsion.

The Department of Finance and the Commission also assert that subsequent judicial construction of former [Revenue and Taxation Code sections 2231](#) and 2207-upon which, as just discussed, [article XIII B, section 6](#), apparently was based-suggests that a narrow meaning was accorded the term "state mandate" at the time [article XIII B, section 6](#), was enacted. The Department relies primarily upon *City of Merced v. State of California* (1984) 153 Cal.App.3d 777 [200 Cal.Rptr. 642] (*City of Merced*). Claimants and amici curiae on their behalf assert that *City of Merced* either is distinguishable or was wrongly decided. We proceed to describe *City of Merced* at some length.

In *City of Merced*, [supra](#), 153 Cal.App.3d 777, the city wished either to purchase or to condemn (under its eminent domain authority) certain privately owned real property. If the city were to elect to proceed by eminent domain, it would be required by a then recent enactment ([Code Civ. Proc., § 1263.510](#)) to compensate the property owner for loss of its "business goodwill." The city did elect to proceed by eminent domain, and in April 1980 the Merced Superior Court issued a final order in condemnation, directing the city to pay the property owner for the latter's loss of business goodwill. The city did so and then sought reimbursement from the state, arguing that the new statutory requirement that it compensate for business goodwill amounted to a reimbursable state mandate. (*City of Merced*, at p. 780.) *738

The constitutional reimbursement provision contained in [article XIII B, section 6](#), did not become operative until July 1, 1980. Accordingly, the City of Merced sought reimbursement under the then existing statutory authority—Revenue and Taxation Code former sections 2231 and 2207—which, as noted, apparently had served as the model for the constitutional provision.

The State Board of Control—which at the time exercised the authority now exercised by the Commission—agreed with the City of Merced and found a reimbursable state mandate. (*City of Merced, supra*, 153 Cal.App.3d 777, 780.) The city's approved claim for reimbursement “was included, along with other similar claims, as a [budget] line item in chapter 1090, Statutes of 1981.” (*Ibid.*) The Legislature, however, refused to authorize the reimbursement, and directed the board not to accept, or submit, any future claim for reimbursement for business goodwill costs. (*Ibid.*)

The City of Merced then sought a writ of mandate commanding the Legislature to provide reimbursement. The trial court denied that request, and the Court of Appeal affirmed. The court concluded that, as a matter of law, the city's increased costs flowing from its election to condemn the property did not constitute a reimbursable state mandate. (*City of Merced, supra*, 153 Cal.App.3d 777, 781-783.) The court reasoned: “[W]hether a city or county decides to exercise eminent domain is, essentially, an option of the city or county, rather than a mandate of the state. The fundamental concept is that the city or county is not required to exercise eminent domain. If, however, the power of eminent domain is exercised, then the city will be required to pay for loss of goodwill. Thus, payment for loss of goodwill is not a state-mandated cost.” (*Id.*, at p. 783.)

The court in *City of Merced, supra*, 153 Cal.App.3d 777, found its construction of former [Revenue and Taxation Code sections 2231 and 2207](#) - as those statutory provisions read at the time they served as the model for [article XIII B, section 6](#)-to be confirmed by the subsequent legislative action amending former [Revenue and Taxation Code section 2207](#) (and related former section 2207.5). As the court explained: “... Senate Bill No. 90 (Russell), 1979-1980 Regular Session ... added [Revenue and Taxation Code section 2207, subdivision \(h\)](#): [¶] ‘Costs mandated by the state’ means any increased costs which a local agency is required to incur as the result of the following: [¶] ... [¶] (h) Any statute enacted after January 1, 1973, or executive order issued after January 1, 1973, which *adds new requirements to an existing optional program or service and thereby increases the cost of such program or service if the local agencies have no reasonable alternatives other than to continue the optional program.*’” (*City of Merced, supra*, 153 Cal.App.3d 777, 783-784, italics added.) *739

(Of relevance here, Senate Bill No. 90 (1979-1980 Reg. Sess.) also added a substantively identical provision to former Revenue and Taxation Code section 2207.5—a specialized section that addressed reimbursable state mandates as they related to a school district.)⁷

The court in *City of Merced* continued: “Senate Bill No. 90 became effective on July 1, 1981, [more than a year] after plaintiff incurred the cost of business goodwill for which it seeks reimbursement. Subdivision (h) appears to have been included in the bill to provide for reimbursement of increased costs in an optional program such as eminent domain when the local agency has no reasonable alternative to eminent domain. The legislative history of Senate Bill No. 90 supports the conclusion that subdivision (h) was added to [Revenue and Taxation Code section 2207](#) to *extend state liability rather than to clarify existing law.*” (*City of Merced, supra*, 153 Cal.App.3d 777, 784, italics added.)

After examining two legislative committee reports,⁸ the court in *City of Merced, supra*, 153 Cal.App.3d 777, asserted that they “characterize Senate Bill No. 90 as expanding the definition of local reimbursable costs. The Legislative Analyst's Report ... on Senate Bill No. 90 similarly includes a statement that the bill expands the definition of state-mandated costs. Such characterizations of the purpose of Senate Bill No. 90 are consistent only with the conclusion that, *until that bill was enacted, increased costs incurred in an optional program such as eminent domain were not state mandated.* Thus the cost of business goodwill for which plaintiff was required [by [Code of Civil Procedure, section 1263.510](#)] to pay in

April 1980, was not a state-mandated cost. It follows that the trial court properly denied the *740 petition for a writ of mandamus to compel payment of that cost.” (*City of Merced, supra*, 153 Cal.App.3d 777, 785, italics added.)

In other words, the court in *City of Merced* concluded that former Revenue and Taxation Code sections 2231 and 2207, as they read at the time they served as the model for article XIII B, section 6, contemplated a narrow definition of reimbursable state mandate, and not the subsequently expanded definition of reimbursable state mandate found in the 1981 amendments to the Revenue and Taxation Code.⁹

A few months after the Court of Appeal filed its opinion in *City of Merced, supra*, 153 Cal.App.3d 777, the Legislature overhauled the law pertaining to state mandates and reimbursements by amending both the Revenue and Taxation Code and the Government Code. (Stats. 1984, ch. 1459, p. 5113.) The Department of Finance and the Commission assert that two aspects of the legislative overhaul are particularly relevant to the issue we address here.

First, the Department of Finance and the Commission assert that the Legislature enacted a new section of the Government Code-section 17514 -in order to implement the reimbursable-state-mandate directive of article XIII B, section 6.¹⁰ The Department and the Commission assert that in enacting that provision, the Legislature readopted the original, narrow definition of reimbursable state mandate found in the initial versions of former Revenue and Taxation Code section 2207-which, the Department and the Commission maintain, existed at the time article XIII B, section 6, was drafted and adopted, and which defined “costs mandated by the state” as those “which a local agency is required to incur.” (See Stats. 1975, ch. 486, § 1.8, p. 997 [Rev. & Tax. Code, former § 2207]; Stats. 1977, ch. 1135, § 5, p. 3646 [Rev. & Tax. Code, former § 2207]; Stats. 1984, ch. 1459, § 1, p. 5114 [Gov. Code, § 17514], italics added.) This same statutory language also had been recently construed at that time in *City of Merced, supra*, 153 Cal.App.3d 777, as recognizing as a reimbursable state mandate only that imposed when the local entity is legally compelled to engage in the underlying practice or program. *741

Second, the Department of Finance and the Commission observe, in enacting Government Code section 17514, the Legislature also provided that the use of the broader definition contained in the amended versions of Revenue and Taxation Code former sections 2207 and 2207.5 (which became effective July 1, 1981) should be phased out, but that the definition could be used to determine claims that arose prior to 1985. (See Stats. 1984, ch. 1459, § 1, p. 5123; 68 Ops.Cal.Atty.Gen. 224 (1985).)

In other words, the Department of Finance and the Commission assert, in the Legislature's 1984 overhaul of the statutory scheme implementing article XIII B, section 6, the Legislature embraced and codified the narrow definition of reimbursable state mandate set out in former Revenue and Taxation Code section 2207 (and construed in *City of Merced*) as the appropriate test in implementing the constitutional provision. Moreover, the Department and the Commission maintain, the Legislature limited the continued use of the broader definition of a statutorily imposed reimbursable state mandate (set out in the amendments to former Revenue and Taxation Code sections 2207 and 2207.5, effective in mid-1981) to a small and ever-decreasing number of cases. Five years later, the Legislature repealed former Revenue and Taxation Code sections 2207 and 2207.5 (see Stats. 1989, ch. 589, §§ 7 & 8, p. 1978)-thereby finally discarding the broad definition of statutorily imposed reimbursable state mandate found in subdivision (h) of each of those statutes.

As noted above, the Department of Finance and the Commission assert in their briefs that based upon the language of article XIII B, section 6, and the statutory and case law history described above, the drafters and the electorate must have intended that a reimbursable state mandate arises only if a local entity is “required” or “commanded” -that is, legally compelled-to participate in a program (or to provide a service) that, in turn, leads unavoidably to increasing the costs incurred by the entity. (*City of Merced, supra*, 153 Cal.App.3d 777, 783; see also *Long Beach Unified Sch. Dist. v. State of California* (1990) 225 Cal.App.3d 155, 174 [275 Cal.Rptr. 449] [construing the term “mandates,” for purposes of art. XIII B, § 6, “in the ordinary sense of 'orders' or 'commands' ”]; *County of Sonoma v. Commission on State Mandates* (2000)

84 Cal.App.4th 1264, 1284 [101 Cal.Rptr.2d 784] (*County of Sonoma*) [Legislature's interpretation of art. XIII B, § 6, in Gov. Code, 17514, as limited to "costs which a ... school district is required to incur" is entitled to great weight].¹¹ *742

2.

Claimants and amici curiae on their behalf assert that even if "legal compulsion" is the governing standard, they meet that test because, they argue, claimants have been legally compelled to incur compliance costs under [Government Code section 54952](#) and [Education Code section 35147](#), subdivision (c). The Commission-but not the Department-supports claimants' proposed application of the legal compulsion test.

In so arguing, claimants focus upon the circumstance that a school district *that participates* in one of the underlying programs listed in [Education Code section 35147](#), subdivision (b), must comply with program requirements, including the statutory notice and agenda obligations, set out in [Government Code section 54952](#) and [Education Code section 35147](#), subdivision (c). Claimants assert: "[O]nce [a district] participates in one of the educational programs at issue, it does not thereafter have the option of performing that activity in a manner that avoids incurring costs mandated by amended [Government Code section 54952](#) and [Education Code section 35147](#)."

The Department of Finance, relying upon *City of Merced, supra*, 153 Cal.App.3d 777, asserts that claimants err by focusing upon a school district's legal obligation to comply with program conditions, rather than focusing upon whether the school district has a legal obligation to participate in the underlying program to which the conditions attach. As suggested above, the core point articulated by the court in *City of Merced* is that activities undertaken at the option or discretion of a local government entity (that is, actions undertaken without any legal compulsion or threat of penalty for nonparticipation) do not trigger a state mandate and hence do not require reimbursement of funds-even if the local entity is obliged to incur costs as a result of its discretionary decision to participate in a particular program or practice. (*Id.*, at p. 783.) Claimants concede that *City of Merced* conflicts with their contrary view, but they assert that the opinion is distinguishable and ask us to decline to follow, or extend, that decision.

Claimants stress-as we acknowledged above-that *City of Merced, supra*, 153 Cal.App.3d 777, was decided in the context of an eminent domain proceeding, and that the appellate court was engaged in construing the *statutory* reimbursement scheme rather than [article XIII B, section 6](#). Claimants also assert that although the City of Merced had discretion whether or *743 not to exercise its power of eminent domain, and was under no compulsion to do so, in the present case "school site council and advisory committee meetings cannot be held in a manner that avoids application of [the requirements of] [Government Code section 54952](#) and [Education Code section 35147](#)."

The points relied upon by claimants neither call into doubt nor persuasively distinguish *City of Merced, supra*, 153 Cal.App.3d 777. The truer analogy between that case and the present case is this: In *City of Merced*, the city was under no legal compulsion to resort to eminent domain-but when it elected to employ that means of acquiring property, its obligation to compensate for lost business goodwill was not a reimbursable state mandate, because the city was not required to employ eminent domain in the first place. Here as well, if a school district elects to participate in or continue participation in any underlying *voluntary* education-related funded program, the district's obligation to comply with the notice and agenda requirements related to that program does not constitute a reimbursable state mandate.¹²

We therefore reject claimants' assertion that merely because they participate in one or more of the various education-related funded programs here at issue, the costs they incurred in complying with program conditions have been legally compelled and hence constitute reimbursable state mandates. We instead agree with the Department of Finance, and with *City of Merced, supra*, 153 Cal.App.3d 777, that the proper focus under a legal compulsion inquiry is upon the nature of claimants' participation in the underlying programs themselves.

3.

Turning to that question-and without deciding whether a finding of legal compulsion to participate in an underlying program is *necessary* in order to establish a right to reimbursement under [article XIII B, section 6](#)-we *744 conclude, upon review of the applicable statutes, that claimants are, and have been, free from legal compulsion as to eight of the nine underlying funded programs here at issue. As to one of the funded programs, we shall assume, for purposes of analysis, that a district's participation in the program is in fact legally compelled.

a.

It appears to be conceded that, as to most of the nine education-related funded programs at issue, school districts are not legally compelled to participate in those programs. For example, the American Indian Early Childhood Education Program ([Ed. Code, § 52060](#) et seq.), which implements projects designed to develop and test educational models to increase reading and math competence of students in preschool and early grades, states that school districts “may apply” to be included in the project (*id.*, § 52063) and, if accepted to participate, will receive program funding (*id.*, § 52062). [Education Code section 52065](#) in turn states that each school district that receives funds provided by section 52062 “shall establish a districtwide American Indian advisory committee for American Indian early childhood education.” Plainly, a school district's initial and continued participation in the program is voluntary, and the obligation to establish or maintain an advisory committee arises only if the district elects to participate in, or continue to participate in, the program. Although the language of most of the other implementing statutes varies, they generally follow this same approach, with the same result: Participation in most of the programs listed in [Education Code section 35147](#) is voluntary, and the obligation to establish or maintain a site council or advisory committee arises only if a district elects to participate in, or continue to participate in, the particular program.

Although *claimants* do not assert that they have been legally compelled to participate in *any* underlying program for which they have sought reimbursement for their compliance costs-and, indeed, their briefing suggests the opposite¹³-the Commission and amicus curiae Education Legal Alliance assert that the school improvement program (a “sunsetting,” but still funded, program that disburses funds for all aspects of school operation and performance; [Ed. Code, §§ 52012](#) et seq., [62000](#), [62000.2](#), subd. (b), [62002](#)) legally compels school districts to establish site councils without regard to whether the district participates in the underlying funded program to which the site councils apply. The Commission and amici curiae rely upon [Education Code section 52010](#), which states in relevant part: “*With the exception of *745 subdivisions (a) and (b) of Section 52011, the provisions of this chapter shall apply only to school districts and schools which participate in school improvement programs authorized by this article.*” (Italics added.) Section 52011, subdivision (b), in turn provides that “each school district shall: [¶] ... [¶] (b) *Adopt policies to ensure that prior to scheduled phase-in, a school site council as described in Section 52012 is established at each school site to consider whether or not it wishes the local school to participate in the school improvement program.*” (Italics added.)

The Commission and amici curiae read these provisions as requiring all schools and school districts throughout the state to “establish a school site council even if the school [or district] does not participate in the school improvement program.” We disagree. Reasonably construed, the statutes require only that a school district adopt “policies” (i.e., a *plan*) “to ensure” that *if* the district elects to participate in the School Improvement Program, a school site council *will*, “prior to phase-in” of the districtwide program, exist at each school, so that each individual school will be able to decide whether it wishes to participate in the district's program. In other words, the statutes require that districts adopt policies or plans for school site councils-but the statutes do not require that districts adopt councils themselves unless the district first elects to participate in the underlying program.¹⁴

We therefore conclude that, as to eight of the nine funded programs, the statutory notice and agenda obligations exist and apply to claimants only because they have *elected* to participate in, or continue to participate in, the various underlying funded programs-and hence to incur notice and agenda costs that are a condition of program participation. Accordingly,

no reimbursable state mandate exists with regard to any of these programs based upon a theory that such costs were incurred under legal compulsion.¹⁵ *746

b.

The Commission and amicus curiae Education Legal Alliance also assert that the Chacon-Moscone Bilingual-Bicultural Education Act of 1976 (another “sunsetting,” but still funded, program; *Ed. Code*, §§ 52160 et seq., 62000, 62000.2, subd. (d), 62002) legally compels school districts to establish advisory committees, regardless whether the district participates in the underlying funded program to which the advisory committees apply. The Commission and amicus curiae rely upon *Education Code* section 52176's command that each school district with more than 50 pupils of limited English language proficiency, and each school within that district with more than 20 pupils of such proficiency, “shall establish a districtwide [or individual school site] advisory committee on bilingual education.” (*Id.*, subds. (a) & (b), italics added.)

The Department of Finance responds that because the Chacon-Moscone Bilingual-Bicultural Education program sunsetted in 1987, school districts that have participated in that program since that date have done so not as a matter of legal compulsion, but by their own choice made when they applied for and were granted such program funds.

We note some support for the Department's view. *Education Code* section 64000 et seq., which governs the funding application process, includes the “sunsetting” Chacon-Moscone Bilingual-Bicultural Education program as one of many optional programs for which a district *may* seek funding. (*Id.*, subd. (a)(4).) But, the Commission argues, another statutory provision suggests that Chacon-Moscone Bilingual-Bicultural Education program advisory committees are mandatory in any event. The Commission notes that section 62002.5 provides that advisory committees “which are in existence pursuant to statutes or regulations as of January 1, 1979, shall continue subsequent to termination of funding for the programs sunsetted by this chapter.” (Italics added.)

We need not, and do not, determine whether claimants have been legally compelled to participate in the Chacon-Moscone Bilingual-Bicultural Education program, or to maintain a related advisory committee. Even if we assume for purposes of analysis that claimants have been legally compelled to participate in the Chacon-Moscone Bilingual-Bicultural Education program, we nevertheless conclude that under the circumstances here presented, *747 the costs necessarily incurred in complying with the notice and agenda requirements under that funded program do not entitle claimants to obtain reimbursement under *article XIII B, section 6*, because the state, in providing program funds to claimants, already has provided funds that may be used to cover the necessary notice and agenda-related expenses.

We note that, based upon the evaluations made by the Commission, the costs associated with the notice and agenda requirements at issue in this case appear rather modest.¹⁶ And, even more significantly, we have found nothing to suggest that a school district is precluded from using a portion of the funds obtained from the state for the implementation of the underlying funded program to pay the associated notice and agenda costs. Indeed, the Chacon-Moscone Bilingual-Bicultural Education program explicitly authorizes school districts to do so. (See *Ed. Code*, § 52168, subd. (b) [“School districts may claim funds appropriated for purposes of this article for expenditures in, but not limited to, the following categories: [¶] ... [¶] (6) Reasonable district administrative expenses”].) We believe it is plain that the costs of complying with program-related notice and agenda requirements qualify as “[r]easonable district administrative expenses.” Therefore, even if we assume for purposes of analysis that school districts have been legally compelled to participate in the funded Chacon-Moscone Bilingual-Bicultural Education program, we view the state's provision of program funding as satisfying, in advance, any reimbursement requirement.

It is conceivable, with regard to some programs, that increased compliance costs imposed by the state might become so great-or funded program grants might become so diminished-that funded program benefits would not cover the compliance costs, or that expenditure of granted program funds on administrative costs might violate a spending limitation set out in applicable regulations or statutes. In those circumstances, a compulsory program participant likely

would be able to establish the existence of a reimbursable ***748** state mandate under [article XIII B, section 6](#). But that certainly is not the situation faced by claimants in this case. At most, claimants, by being compelled to incur notice and agenda compliance costs-and pay those costs from program funds-have suffered a relatively minor diminution of program funds available to them for substantive program purposes. The circumstance that the program funds claimants may have wished to use exclusively for substantive program activities are thereby reduced, does not in itself transform the related costs into a reimbursable state mandate. (See *County of Sonoma, supra*, 84 Cal.App.4th 1264 [art. XIII B, § 6, provides no right of reimbursement when the state *reduces* revenue granted to local government].) Nor is there any reason to believe that use of granted program funds to pay the relatively modest costs here at issue would violate any applicable spending limitation.¹⁷

We therefore conclude that because claimants are and have been free to use funds from the Chacon-Moscone Bilingual-Bicultural Education program to pay required program expenses (including the notice and agenda costs here at issue), claimants are not entitled under [article XIII B, section 6](#), to reimbursement from the state for such expenses.

B.

([2a]) Claimants contend that even if they have not been *legally compelled* to participate in most of the programs listed in [Education Code section 35147](#), subdivision (b), and hence have not been *legally required* to incur the related notice and agenda costs, they nevertheless have been compelled as a practical matter to participate in those programs and hence to incur such costs. Claimants assert that school districts have “had no true option or choice but to participate in these [underlying education-related] programs. *This absence of a reasonable alternative to participation is a de facto mandate.*” As explained below, on the facts of this case, we disagree. ***749**

1.

Claimants and amici curiae supporting them, relying upon this court's broad interpretation of the federal mandate provision of [article XIII B, section 9](#),¹⁸ in *City of Sacramento, supra*, 50 Cal.3d 51, 70-76, assert that we should recognize and endorse such a broader construction of [section 6](#) of that article-a construction that does not limit the definition of a reimbursable state mandate to circumstances of *legal* compulsion.

In *City of Sacramento, supra*, 50 Cal.3d 51, we considered whether various federal “incentives” for states to extend unemployment insurance coverage to all public employees constituted a reimbursable state mandate under [article XIII B, section 6](#), or a federal mandate within the meaning of [article XIII B, section 9](#).

We concluded in *City of Sacramento, supra*, 50 Cal.3d 51, that there was no reimbursable state mandate under [article XIII B, section 6](#), because the implementing state legislation did not impose any new or increased “program or service,” or “unique” requirement, upon local entities. (*City of Sacramento*, at pp. 66-70.)

Turning to the question whether the state legislation constituted a “federal mandate” under [article XIII B, section 9](#), we acknowledged in *City of Sacramento, supra*, 50 Cal.3d 51, that there was no legal compulsion requiring the states to participate in the federal plan to extend unemployment insurance coverage to all public employees. We nevertheless found that the costs related to the program constituted a federal mandate, for purposes of [article XIII B, section 9](#). Our opinion concluded that because the financial consequences to the state and its residents of failing to participate in the federal plan were so onerous and punitive-we characterized the consequences as amounting to “certain and severe federal penalties” including “double ... taxation” and other “draconian” measures (*City of Sacramento*, at p. 74)-as a practical matter, for purposes of [article XIII B, section 9](#), the state was mandated to participate in the federal plan to extend unemployment insurance coverage. ***750**

Claimants, echoing the reasoning of the Court of Appeal below, assert that because this court in *City of Sacramento, supra*, 50 Cal.3d 51, broadly construed the term “federal mandate”-to include not only the situation in which a state or local entity is itself legally compelled to participate in a program and thereby incur costs, but also the situation in which the governmental entity's participation in the federal program is the coerced result of severe penalties that would be imposed for noncompliance-consistency requires that we afford a similarly broad construction to the concept of a state mandate. In other words, claimants argue, the word “mandate,” used in two separate sections of [article XIII B](#), should not be given two different meanings.

The Department and the Commission disagree. They assert that, to begin with, a finding of a *federal mandate* under [section 9 of article XIII B](#) has a wholly different purpose and effect as compared with a finding of a *state mandate* under [section 6](#) of that article. The Department and the Commission argue that although a finding of a state mandate may result in reimbursement from the state to a local entity for costs incurred by the local entity, expenditures made in order to comply with a federal mandate are excluded from the constitutional spending cap imposed by [article XIII B](#) upon any affected state or local entity, because such expenditures are not considered to be an exercise of the state or local authority's discretionary spending authority.

Moreover, the Department and the Commission assert, our conclusion in *City of Sacramento, supra*, 50 Cal.3d 51, regarding the proper construction of [article XIII B, section 9](#), relied upon “crucial facts” (*City of Sacramento*, at p. 73) that do not pertain to the wholly separate issue that we face here-the proper interpretation of [article XIII B, section 6](#). They observe that, as we explained in *City of Sacramento*, when [article XIII B](#) was enacted: “First, the power of the federal government to impose its direct regulatory will on state and local agencies was *then* sharply in doubt.¹⁹ Second, in conformity with this principle, the vast bulk of cost-producing federal influence on government at the state and local levels was by inducement or incentive rather than direct [legal] compulsion. That remains so to this day. [¶] Thus, if [article XIII B](#)'s reference to 'federal mandates' were limited to strict legal compulsion by the federal government, it would have been largely superfluous. It is well settled that 'constitutional ... enactments must receive a liberal, practical common-sense construction which will meet changed conditions and the growing needs of the people. [Citations.]' (*Amador Valley *751 Joint Union High Sch. Dist. v. State Bd. of Equalization* (1978) 22 Cal.3d 208, 245 [149 Cal.Rptr. 239, 583 P.2d 1281].) While '[a] constitutional amendment should be construed in accordance with the natural and ordinary meaning of its words[,] [citation] [, t]he literal language of enactments may be disregarded to avoid absurd results and to fulfill the apparent intent of the framers. [Citations.]' (*Ibid.*)” (*City of Sacramento, supra*, 50 Cal.3d 51, 73, fns. omitted.)

The Department of Finance and the Commission argue that these factors have no bearing upon the proper interpretation of what constitutes a state mandate under [article XIII B, section 6](#). ([3])(See **fn. 20**) They assert that, unlike the federal government, which for a time was severely restricted in its ability to directly impose legal requirements upon the states (see *City of Sacramento, supra*, 50 Cal.3d 51, 71-73), the State of California has suffered no such restriction, vis-a-vis local government entities, except in matters involving purely local affairs.²⁰ ([2b]) Accordingly, the Department and the Commission argue, in contrast with the situation we faced when construing [article XIII B, section 9](#), we would not render superfluous the restriction in [section 6](#) of that article, were we narrowly to interpret its term “mandate” to include only programs in which local entities are legally compelled to participate.

We find it unnecessary to resolve whether our reasoning in *City of Sacramento, supra*, 50 Cal.3d 51, applies with regard to the proper interpretation of the term “state mandate” in [section 6 of article XIII B](#). Even assuming, for purposes of analysis only, that our construction of the term “federal mandate” in *City of Sacramento, supra*, 50 Cal.3d 51, applies equally in the context of [article XIII, section 6](#), for reasons set out below we conclude that, contrary to the situation we described in that case, claimants here have not faced “certain and severe ... penalties” such as “double ... taxation” and other “draconian” consequences (*City of Sacramento, supra*, 50 Cal.3d at p. 74), and hence have not been “mandated,” under [article XIII, section 6](#), to incur increased costs.

2.

([4]) As we observed in *County of San Diego, supra*, 15 Cal.4th 68, 81, article XIII B, section 6's "purpose is to preclude the state from shifting *752 financial responsibility for carrying out governmental functions to local agencies, which are 'ill equipped' to assume increased financial responsibilities." ([2c]) In light of that purpose, we do not foreclose the possibility that a reimbursable state mandate under article XIII B, section 6, properly might be found in some circumstances in which a local entity is not legally compelled to participate in a program that requires it to expend additional funds.

As noted, claimants argue that they have had "no true option or choice" but to participate in the various programs here at issue, and hence to incur the various costs of compliance, and that "the absence of a reasonable alternative to participation is a de facto [reimbursable state] mandate." In the same vein, amici curiae on behalf of claimants emphasize that as a practical matter, many school districts depend upon categorical funding for various programs. Amicus curiae California State Association of Counties asks us to interpret article XIII B, section 6, as providing state reimbursement for programs that are "*indirectly* state mandated." (Italics added.) Amicus curiae Education Legal Alliance goes so far as to assert that unless we recognize a right to reimbursement for costs such as those here at issue, "California schools could be forced to [forgo] participation in important categorical programs that supply necessary financial and educational support to those segments of the student population that need the most assistance. Alternatively, California schools could be forced to cut other student programs or services to fund these procedural requirements."

The record in the case before us does not support claimants' characterization of the circumstances in which they have been forced to operate, and provides no basis for resolving the accuracy of amici curiae's warnings and predictions. Indeed, we are skeptical of the assertions of claimants and amici curiae.

As observed *ante* (fn. 16), the costs associated with the notice and agenda requirements at issue in this case appear rather modest. Moreover, the parties have not cited, nor have we found, anything in the governing statutes or regulations, or in the record, to suggest that a school district is precluded from using a portion of the program funds obtained from the state to pay associated notice and agenda costs. As noted above, under the Chacon-Moscone Bilingual-Bicultural Education program (Ed. Code, § 52168, subd. (b)(6)), such authority has been granted. As to three of the remaining programs here at issue, such authority also is explicit, or at least strongly implied. (See 20 U.S.C. § 7425(d) [federal Indian Education Program]; *753 Ed. Code, §§ 63000, subds. (c), (g), 63001 [school improvement program and McAteer Act].) We do not perceive any reason why the Legislature would contemplate a different rule for any of the other programs here at issue, and claimants have advanced no such reason.²¹

As to each of the optional funded programs here at issue, school districts are, and have been, free to decide whether to (i) continue to participate and receive program funding, even though the school district also must incur program-related costs associated with the notice and agenda requirements, or (ii) decline to participate in the funded program. Presumably, a school district will continue to participate only if it determines that the best interests of the district and its students are served by participation—in other words, if, *on balance*, the funded program, even with strings attached, is deemed beneficial. And, presumably, a school district will decline participation if and when it determines that the costs of program compliance outweigh the funding benefits.

In essence, claimants assert that their participation in the education-related programs here at issue is so beneficial that, as a practical matter, they feel they must participate in the programs, accept program funds, and—by virtue of Government Code section 54952 and Education Code section 35147—incur expenses necessary to comply with the procedural conditions imposed on program participants. Although it is completely understandable that a participant in a funded program may be disappointed when additional requirements (with their attendant costs) are imposed as a condition of *754 continued participation in the program, just as such a participant would be disappointed if the total amount of the annual funds provided for the program were reduced by legislative or gubernatorial action, the circumstance that the Legislature has determined that the requirements of an ongoing elective program should be

modified does not render a local entity's decision whether to continue its participation in the modified program any less voluntary.²² (See *County of Sonoma, supra*, 84 Cal.App.4th 1264 [art. XIII B, § 6, provides no right of reimbursement when the state *reduces* revenue granted to local government].) We reject the suggestion, implicit in claimants' argument, that the state cannot legally provide school districts with funds for voluntary programs, and then effectively reduce that funding grant by requiring school districts to incur expenses in order to meet conditions of program participation.

In sum, the circumstances presented in the case before us do not constitute the type of nonlegal compulsion that reasonably could constitute, in claimants' phrasing, a “de facto” reimbursable state mandate. Contrary to the situation that we described in *City of Sacramento, supra*, 50 Cal.3d 51, a claimant that elects to discontinue participation in one of the programs here at issue does not face “certain and severe ... penalties” such as “double ... taxation” or other “draconian” consequences (*id.*, at p. 74), but simply must adjust to the withdrawal of grant money along with the lifting of program obligations. Such circumstances do not constitute a reimbursable state mandate for purposes of [article XIII B, section 6](#).

IV

For the reasons stated, we conclude that claimants have failed to establish that they are entitled to reimbursement under [article XIII B, section 6, of the California Constitution](#), with regard to any of the program costs here at issue. *755

The judgment of the Court of Appeal is reversed.

Kennard, J., Baxter, J., Werdegar, J., Chin, J., Brown, J., and Moreno, J., concurred. *756

Footnotes

- 1 [Government Code section 54952](#), a provision of the Brown Act, provides in relevant part: “As used in this chapter, 'legislative body' means: [¶] (a) The governing body of a local agency or any other local body created by state or federal statute. [¶] (b) A commission, committee, board, or other body of a local agency, whether permanent or temporary, decisionmaking or advisory, created by charter, ordinance, resolution, or formal action of a legislative body....”
- 2 [Education Code section 35147](#) provides in relevant part: “(a) Except as specified in this section, any meeting of the councils or committees specified in subdivision (b) is exempt from ... the Ralph M. Brown Act... [¶] (b) The councils and schoolsite advisory committees established pursuant to Sections 52012, 52065, 52176, and 52852, subdivision (b) of Section 54425, Sections 54444.2, 54724, and 62002.5, and committees formed pursuant to Section 11503 or [Section 2604 of Title 25 of the United States Code](#), are subject to this section. [¶] (c) Any meeting held by a council or committee specified in subdivision (b) shall be open to the public and any member of the public shall be able to address the council or committee during the meeting on any item within the subject matter jurisdiction of the council or committee. Notice of the meeting shall be posted at the schoolsite, or other appropriate place accessible to the public, at least 72 hours before the time set for the meeting. The notice shall specify the date, time, and location of the meeting and contain an agenda describing each item of business to be discussed or acted upon. The council or committee may not take any action on any item of business unless that item appeared on the posted agenda or unless the council or committee members present, by unanimous vote, find that there is a need to take immediate action and that the need for action came to the attention of the council or committee subsequent to the posting of the agenda....”

The nine school site councils and advisory committees specified in subdivision (b), above, were established as part of the following programs: The school improvement program ([Ed. Code, § 52010](#) et seq.; see *id.*, §§ 62000, 62000.2, subd. (b), 62002) [a general program that disburses funds for all aspects of school operation and performance]; the American Indian Early Childhood Education Program ([Ed. Code, § 52060](#) et seq.); the Chacon-Moscone Bilingual-Bicultural Education Act of 1976 ([Ed. Code, § 52160](#) et seq.; see *id.*, 62000, 62000.2, subd. (d)); the School-Based Program Coordination Act ([Ed. Code, § 52850](#) et seq. [a program designed to coordinate various categorical aid programs]); the McAteer Act ([Ed. Code, § 54400](#) et seq. [various compensatory education programs for “disadvantaged minors”]); the Migrant Children Education Programs ([Ed. Code, § 54440](#) et seq.); the School-Based Pupil Motivation and Maintenance Program and Dropout Recovery Act ([Ed. Code,](#)

§ 54720 et seq. [a program designed to address truancy and dropout issues]); the Programs to Encourage Parental Involvement (Ed. Code, § 11500 et seq.); and the federal Indian Education Program (20 U.S.C. § 7421 et seq. [former 25 U.S.C. § 2601 et seq.].)

3 In December 1994, Santa Clara County filed the first test claim, asserting that Government Code section 54952 imposed a reimbursable state mandate. In December 1995, Kern High School District filed a test claim asserting that Education Code section 35147 imposes a reimbursable state mandate. These two claims were consolidated, and San Diego Unified School District was added as a coclaimant.

4 The trial court stated: “Two primary issues are raised in this matter. The first issue is whether the 1993 amendments to the Brown Act [that is, enactment of Government Code section 54952] and the 1994 enactment of ... [Education Code] section 35147 mandate a new program or higher level of service. The Court concludes that they do. The second issue is whether a reimbursable state mandate is created only when an advisory council or committee which is subject to the Brown Act is required by state law. The Court concludes that it is not.”

5 The Court of Appeal also concluded that Government Code section 54952 and Education Code section 35147 establish a “higher level of service” under article XIII B, section 6. We need not and do not review that determination here, and express no view on the validity of that conclusion.

6 As we observed in *City of Sacramento*, *supra*, 50 Cal.3d at page 70, “extension of the subvention requirements to costs ‘incidentally’ imposed on local governments would require the Legislature to assess the fiscal effect on local agencies of each law of general application. Moreover, it would subject much general legislation to the supermajority vote required to pass a companion local-government revenue bill. Each such necessary appropriation would, in turn, cut into the state’s article XIII B spending limit. ([Art. XIII B,] § 8, subd. (a).)” We reaffirmed that “nothing in the language, history, or apparent purpose of article XIII B suggested such far-reaching limitations on legitimate state power.” (50 Cal.3d at p. 70.)

7 Revised section 2207.5 provided that “ ‘[c]osts mandated by the state’ means any increased costs which a school district is required to incur as a result of ... [¶] ... [¶] (h) Any statute enacted after January 1, 1973, or executive order issued after January 1, 1978, which adds new requirements to an existing optional program or service and thereby increases the cost of such program or service *if the school districts have no reasonable alternatives other than to continue the optional program.*” (Stats. 1980, ch. 1256, § 5, pp. 4248-4249, eff. July 1, 1981, italics added.)

8 The court in *City of Merced* asserted: “The Report of the Assembly Revenue and Taxation Committee ... includes a statement: ‘SB 90 further defines “mandated costs” in Sections 4 and 5 to include the following: [¶] ... [¶] e. Where a statute or executive order adds *new requirements to an existing optional program*, which increases costs if the local agency has no reasonable alternative than to continue that optional program.’ (Rep., p. 1, italics in original.) [¶] Additionally, the Ways and Means Committee’s Staff Analysis ... notes that Senate Bill No. 90: ‘Expands the definition of *local* reimbursable costs mandated and paid by the state to include: [¶] ... [¶] e. Statutes or executive orders adding *new requirements to an existing optional program*, which increases costs if the local agency has no reasonable alternative than to continue that optional program.’ (P. 2, italics in original.)” (*City of Merced*, *supra*, 153 Cal.App.3d at p. 784.)

9 We need not, and do not, decide whether the court in *City of Merced*, *supra*, 153 Cal.App.3d 777, correctly characterized the statutory history of the 1981 amendments to the Revenue and Taxation Code.

10 Government Code section 17514 reads: “ ‘Costs mandated by the state’ means any increased costs which a local agency or school district is *required* to incur after July 1, 1980, as a result of any statute enacted on or after January 1, 1975, or any executive order implementing any statute enacted on or after January 1, 1975, which mandates a new program or higher level of service of an existing program within the meaning of Section 6 of Article XIII B of the California Constitution.” (Italics added.)

11 Although, as described immediately below (in pt. III.A.2.), the Commission attempts to defend on other grounds its determination below in favor of claimants, the Commission strongly disputes the Court of Appeal’s broad interpretation of state mandate as encompassing circumstances in which a local entity is not “ordered or commanded” to perform a task that in turn requires it to incur additional costs.

12 The Commission further attempts to distinguish *City of Merced*, *supra*, 153 Cal.App.3d 777, by observing that the eminent domain statute at issue in that case made clear, in the *same* statute that imposed the requirement that an entity employing eminent domain also compensate for lost business goodwill, the discretionary nature of the decision whether to acquire property by purchase or instead by eminent domain. The Commission argues that no such express statement concerning local government discretion is set out in the statutes here at issue. As we explain *post*, part III.A.3.a., however, the underlying program statutes at issue in this case (with one possible exception—see *post*, pt. III.A.3.b.) make it clear that school districts retain the discretion not to participate in any given underlying program—and, as we explain *post*, footnote 22, the circumstance

- that the notice and agenda requirements of these elective programs were enacted *after* claimants first chose to participate in the programs does not make claimants' choice to continue to participate in those programs any less voluntary.
- 13 Claimants at one point characterize themselves as having “*decided* to participate in the programs listed in [Education Code section 35147](#).” (Italics in added.)
- 14 Amicus curiae California School Boards Association suggests that provisions of two other programs—the School-Based Program Coordination Act ([Ed. Code, § 52850](#) et seq.) and the School-Based Pupil Motivation and Maintenance Program and Dropout Recovery Act ([Ed. Code, § 54720](#) et seq.)—require that site councils be established, whether or not the school district participates in the underlying program. In both instances, the statutes make it clear that “prior to a school beginning to develop a [program] plan,” the district first must establish a local school site council that in turn will “consider whether or not it wishes the local school to participate in the” program. Amicus curiae misreads the statutes; in both instances, the statutes make it clear that these requirements apply “only to school districts and schools *which participate in*” the respective programs (see [Ed. Code, §§ 52850, 54722](#), italics added), and each statutory scheme provides that school site councils “shall be established at each school *which participates in*” the program. (*Id.*, [§§ 52852, 54722](#), italics added.)
- 15 In this case, we have no occasion to decide whether a reimbursable state mandate would arise in a situation in which a local entity voluntarily has elected to participate in a program but also has committed to continue its participation for a specified number of years, and the state imposes additional requirements at a time when the local entity is not free to end its participation.
- 16 Costs of compliance with the notice and agenda requirements have been estimated as amounting to approximately \$90 per meeting for the 1994-1995 fiscal year, and incrementally larger amounts in subsequent years, up to \$106 per meeting for the 2000-2001 fiscal year, for each committee or advisory council. (See State Controller, State Mandated Costs Claiming Instrns. No. 2001-08, School Site Councils and Brown Act Reform (June 4, 2001), Parameters and Guidelines (Mar. 29, 2001) [and implementing forms].) Under these formulae, a district that has 10 schools, each with one council or advisory committee that meets 10 times a year, would be forced to incur approximately \$9,000 to \$10,000 in costs to comply with statutory notice and agenda requirements. Presumably, such costs are minimal relative to the funds allocated by the state to the school district under these programs. (We hereby grant the Commission's request that we take judicial notice of these and related documents, and of the Commission's December 13, 2001 Statewide Cost Estimate for reimbursement to school districts of notice and agenda-related expenses.)
- 17 With regard to the Chacon-Moscone Bilingual-Bicultural Education program, claimants assert that “[s]tate regulations place a ceiling on the amount of program funds that may be expended for indirect costs at three percent of the district's funding” (See [Cal. Code Regs., tit. 5, §§ 3900](#), subd. (g) & 3947, subd. (a).) As the Department observes, applicable statutory provisions appear to set the limit for such expenses for the *same* program at no more than 15 percent of granted program funds. (See [Ed. Code, § 63000](#), subd. (d), 63001.) Even assuming, for purposes of analysis, that the regulation, and not the statute, applies with regard to this program, it seems clear that the notice and agenda costs here at issue fall far below 3 percent of granted program funds. Indeed, claimants concede: “The notice and agenda costs at issue are administrative costs that appear to fall within [the regulatory] provisions.”
- 18 That provision states: “'Appropriations subject to limitation' for each entity of government do not include: [¶] ... [¶] (b) Appropriations required to comply with mandates of the courts or the federal government which, without discretion, require an expenditure for additional services or which unavoidably make the provision of existing services more costly.”
- 19 See discussion in [City of Sacramento, supra](#), 50 Cal.3d at pages 71-73.
- 20 Unlike the federal-state relationship, sovereignty is not an issue between state and local governments. Claimant school districts are agencies of the state, and not separate or distinct political entities. (See [California Teachers Assn. v. Hayes](#) (1992) 5 Cal.App.4th 1513, 1524 [7 Cal.Rptr.2d 699].)
- 21 Nor is there any reason to believe that expenditure of granted program funds on the notice and agenda costs at issue would violate any spending limitation set out in applicable regulations or statutes. Claimants assert that with regard to the school improvement programs, state regulations ([Cal. Code Regs., tit. 5, §§ 3900](#), subd. (b), 3947, subd. (a)) limit spending on administrative expenses to no more than 3 percent of granted program funds. As the Department observes, applicable statutory provisions appear to set the limit for such expenses for the *same* program at no more than 15 percent of granted program funds. (See [Ed. Code, §§ 63000](#), subd. (c), 63001.) But even assuming, for purposes of analysis, that the regulations apply with regard to this program, claimants have made no showing that the notice and agenda costs here at issue exceed 3 percent of granted program funds. As noted *ante*, at page 732, statewide program grants for the school improvement programs alone amounted to approximately \$394 million in fiscal year 1998-1999. According to the Commission, statewide notice and agenda costs for *all nine* of the programs here at issue amounted to only \$5.2 million during that same period. (See Com. on State Mandates, Adopted Statewide Cost Estimate, Dec. 13, 2001, p. 1.)

Similarly, claimants have not demonstrated that the notice and agenda costs here at issue exceed the administrative costs spending limitations set for the federal Indian Education Program (see 20 U.S.C. § 7425(d) [5 percent limitation]) and for the McAteer Act's "compensatory education programs" (see Ed. Code, §§ 63000, subd. (g), 63001 [15 percent limitation].)

22 Claimants assert that the notice and agenda requirements were imposed for the first time by Government Code section 54952 and Education Code section 35147 in the mid-1990's—"after the school districts decided to participate in the programs listed in Education Code section 35147." Even if we assume, contrary to the opposing position of the Department of Finance, that claimants first were subjected to notice and agenda requirements only after their respective school districts elected to participate in the programs, a school district's *continued* participation in the programs would be no less voluntary. As noted above, school districts have been, and remain, legally free to decline to continue to participate in the eight programs here at issue.

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ATTACHMENT 30

110 Cal.App.4th 1176
Court of Appeal, Second District, Division 7, California.

COUNTY OF LOS ANGELES, Plaintiff and Respondent,

v.

COMMISSION ON STATE MANDATES, Defendant and Appellant;
Department of Finance, Real Party in Interest and Appellant.

No. B156870.

|

July 28, 2003.

Synopsis

Background: County petitioned for writ of mandate, seeking to vacate decision of the Commission on State Mandates which denied county's test claim for costs associated with statute requiring local law enforcement officers to participate in two hours of domestic violence training. The Superior Court, Los Angeles County, No. BS06497, [Dzintra I. Janavs, J.](#), granted the petition. Commission appealed.

[Holding:] The Court of Appeal, Muñoz (Aurelio), J., sitting by assignment, held that statute did not mandate any increased costs and thus Commission was not required to reimburse county for its costs.

Reversed with directions.

West Headnotes (18)

[1] Mandamus  Specific Acts

Administrative mandamus is the exclusive means to challenge a decision of the Commission on State Mandates on a subvention claim. [West's Ann.Cal.Gov.Code § 17559](#).

[Cases that cite this headnote](#)

[2] States  State expenses and charges and statutory liabilities

Trial court reviews the decision of the Commission on State Mandates under the substantial evidence standard. [West's Ann.Cal.Gov.Code § 17559](#).

[Cases that cite this headnote](#)

[3] Administrative Law and Procedure  Scope

When the substantial evidence test is applied by the trial court to review an administrative decision, the Court of Appeal is generally confined to inquiring whether substantial evidence supports the court's findings and judgment; however, it independently reviews the superior court's legal conclusions about the meaning and effect of constitutional and statutory provisions.

[Cases that cite this headnote](#)

[4] States  [State expenses and charges and statutory liabilities](#)

Reimbursement to a county for costs incurred under a state mandate is not required unless there is a showing of actual increased costs mandated by the state. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[5] Municipal Corporations  [Limitation of Amount](#)

Municipal Corporations  [Power and Duty to Tax in General](#)

States  [Limitation of amount of indebtedness or expenditure](#)

Taxation  [Levy and apportionment](#)

Goal of propositions which imposed limit on the power of state and local governments to adopt and levy taxes and complementary limit on governmental spending is to protect citizens from excessive taxation and government spending. [West's Ann.Cal. Const. Art. 13A, § 1 et seq.;](#) [Art. 14, § 1 et seq.](#)

[Cases that cite this headnote](#)

[6] States  [State expenses and charges and statutory liabilities](#)

The state is required to pay for any new governmental programs, or for higher levels of service under existing programs, that it imposes upon local governmental agencies. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[1 Cases that cite this headnote](#)

[7] States  [State expenses and charges and statutory liabilities](#)

A “program” falling within constitution section requiring state to pay for increased costs associated with state mandates is defined as a program which carries out the governmental function of providing services to the public, or laws which, to implement a state policy, impose unique requirements on local governments and do not apply generally to all residents and entities in the state. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[1 Cases that cite this headnote](#)

[8] States  [State expenses and charges and statutory liabilities](#)

A program falling under constitution section requiring state to pay for increased costs associated with state mandates is a “new program” if the local governmental entity had not previously been required to institute it. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[9] States  [State expenses and charges and statutory liabilities](#)

“State mandates” are requirements imposed on local governments by legislation or executive orders. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[10] States  [State expenses and charges and statutory liabilities](#)

Purpose of constitution section requiring state to pay for increased costs associated with state mandates is to avoid governmental programs from being forced on localities by the state. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[11] States  [State expenses and charges and statutory liabilities](#)

Programs which are not unique to the government do not qualify as programs for which the state is required to pay increased costs pursuant to constitutional provision governing funding of state mandates; the programs must involve the provision of governmental services. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[1 Cases that cite this headnote](#)

[12] States  [State expenses and charges and statutory liabilities](#)

In order for a state mandate to be found under constitution section requiring state to pay for increased costs associated with state mandates, the local governmental entity must be required to expend the proceeds of its tax revenues. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[13] States  [State expenses and charges and statutory liabilities](#)

In order for a state mandate to be found under constitution section requiring state to pay for increased costs associated with state mandates, there must be compulsion to expend revenue. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[14] States  [State expenses and charges and statutory liabilities](#)

Statute requiring local law enforcement officers to participate in two hours of domestic violence training did not mandate any increased costs and thus Commission on State Mandates was not required to reimburse county for its costs associated with the mandate even though county had added two hours to its Peace Officer Standards and Training (POST); statute directed local law enforcement agencies to reallocate training resources rather than to add training, and state did not shift cost of a program previously administered and funded by the state. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

See 9 Witkin, Summary of Cal. Law (9th ed. 1988) Taxation, § 123A; 3 Witkin, Cal. Procedure (4th ed. 1997) Actions, § 614.

[3 Cases that cite this headnote](#)

[15] States  [State expenses and charges and statutory liabilities](#)

In the case of an existing program, an increase in existing costs does not result in a reimbursement requirement under constitutional section requiring state to pay for increased costs associated with state mandate. [West's Ann.Cal. Const. Art. 13B, § 6.](#)

[Cases that cite this headnote](#)

[16] States ← State expenses and charges and statutory liabilities

Under constitution section requiring state to pay for increased costs associated with state mandates, “costs” does not necessarily equal every increase in a locality's budget resulting from compliance with a new state directive; rather, the state must be attempting to divest itself of its responsibility to provide fiscal support for a program, or forcing a new program on a locality for which it is ill-equipped to allocate funding. [West's Ann.Cal. Const. Art. 13B, § 6](#).

[1 Cases that cite this headnote](#)

[17] States ← State expenses and charges and statutory liabilities

Legislative disclaimers, findings, and budget control language are not determinative to a finding of a state mandated reimbursable program. [West's Ann.Cal. Const. Art. 13B, § 6](#).

[Cases that cite this headnote](#)

[18] States ← State expenses and charges and statutory liabilities

Not every increase in cost that results from a new state directive automatically results in a valid subvention claim, especially if the directive can be complied with by a minimal reallocation of resources within the entity seeking reimbursement. [West's Ann.Cal. Const. Art. 13B, § 6](#).

[2 Cases that cite this headnote](#)

Attorneys and Law Firms

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[Lloyd W. Pellman](#), County Counsel and Stephen R. Morris, Principal Deputy County Counsel, for Plaintiff and Respondent County of Los Angeles.

Opinion

MU#NOZ (AURELIO), J. *

A 1995 amendment to [Penal Code section 13519](#)¹ requires local law enforcement officers to participate in two hours of domestic violence training. The issue on appeal is whether this amendment resulted in a reimbursable state-mandated program within the meaning of [article XIII B, section 6 of the California Constitution](#) for the time spent by local law enforcement officers in such domestic violence training, although such officers were already required to spend 24 hours in continuing education training and the domestic violence training could be included within this total.

This administrative mandamus proceeding was commenced by the County of Los Angeles (County) on a “test claim” filed with and denied by the ***1179** Commission on State Mandates (Commission) for the County's costs incurred pursuant to [section 13519](#). The trial court found that [California Constitution article XIII B, section 6](#) required the state

to reimburse the County for domestic violence training because the County's needs and priorities might be detrimentally affected when the state took away two hours of training by mandating that two specific hours of training occur. The trial court remanded the proceedings to the Commission to determine the amount of costs actually incurred by the County. We reverse.

FACTUAL BACKGROUND AND PROCEDURAL HISTORY

[Article XIII B, section 6 of the California Constitution](#) provides: “Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service....” ([Cal. Const., art. XIII B, § 6.](#)) The Commission is charged with hearing and deciding local agency claims of entitlement to reimbursement under [article XIII B, section 6.](#) ([Gov.Code, § 17551](#), subd. (a).) Pursuit of such a claim is the exclusive remedy for this purpose ([Gov.Code, § 17552](#)), but the Commission's decisions are subject to review by administrative mandamus, under [Code of Civil Procedure section 1094.5.](#) ([Gov.Code, § 17559](#), subd. (b).) A “test claim” is “the first claim, ****423** including claims joined or consolidated with the first claim, filed with the commission alleging that a particular statute or executive order imposes costs mandated by the state.” ([Gov.Code, § 17521](#); see also *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 328–329, 331–333, 285 Cal.Rptr. 66, 814 P.2d 1308.)

In 1995, [section 13519](#), subdivision (e) was amended to provide: “(e) Each law enforcement officer below the rank of supervisor who is assigned to patrol duties and would normally respond to domestic violence calls or incidents of domestic violence shall complete, every two years, an updated course of instruction on domestic violence that is developed according to the standards and guidelines developed pursuant to subdivision (d). The instruction required pursuant to this subdivision shall be funded from existing resources available for the training required pursuant to this section. It is the intent of the Legislature not to increase the annual training costs of local government.”²

***1180** Penal Code section 13510,³ et seq. requires the State Commission on Peace Officer Standards and Training (POST) to promulgate regulations establishing minimum state standards relating to physical, mental, and moral fitness, and minimum training standards for law enforcement officers. Compliance with POST's requirements is voluntary. ([Pen.Code, § 13510 et seq.](#)) POST has a certification program for peace officers specified in [sections 13510](#) and [13522](#) and for the California Highway Patrol. ([Pen.Code, §§ 13510.1](#), subds.(a)-(c), 13510.3.)

On or about December 26, 1996, the County filed a “test claim”⁴ pursuant to [Government Code section 17522](#) with the Commission.⁵ The test claim alleged that ****424** neither local police officers nor their agencies were given any choice with respect to compliance with [section 13519](#). However, in order to implement the training, the County was required to redirect its officers from their normal work in order to attend the two-hour domestic violence training. The County alleged this substitution of the work agenda of the state for that of the local government violated [California Constitution article XIII B, section 6](#). Furthermore, the County pointed to language in ***1181** [Penal Code section 13519](#), subdivision (e), providing that, “The instruction required pursuant to this subdivision shall be funded from existing resources available for the training required pursuant to this section. It is the intent of the Legislature not to increase the annual training costs of local government entities.”

The test claim alleged that although POST bore the cost of producing two-hour telecourses on domestic violence, POST did not provide for any local law enforcement salary reimbursement for attendance at any type of POST-certified training, including the state-mandated costs for domestic violence training. Adherence to POST standards is voluntary by local law enforcement agencies, but POST requires a minimum of 24 hours of training every two years, to be chosen from a menu of available courses. POST does not dictate the courses that must be taken. POST courses include training in, among other things: interviewing techniques for detectives, defensive weapons, CPR, conflict resolution, bicycle patrol,

ritual crime and hate group offenders, vehicle pullover and approach, confessions, courtroom demeanor, electronic vehicle recovery systems, vehicle theft investigation, and cultural awareness.

The POST program gives local law enforcement agencies flexibility in choosing training programs to meet their differing needs. In addition to domestic violence training, certain other programs are legislatively mandated: dealing with the developmentally disabled/mentally ill training (implemented July 1992); high speed vehicle pursuits (implemented November 1994); first aid/CPR (a 21-hour initial course, with a 12-hour refresher course every three years); missing persons (implemented January 1989); racial and cultural diversity (implemented August 1983); sexual harassment (implemented November 1994); and sudden infant death syndrome (implemented July 1990). The time requirements for these other required courses vary. Some elective courses require 40 hours to complete.

However, the County alleged because there were no existing resources available for the domestic violence training, the annual training costs of the County were increased as a result of [section 13519](#). The County Sheriff's Department incurred costs of \$170,351.45 for domestic violence training for the fiscal year 1996–1997.

In support of its test claim, the County submitted legislative materials relating to [section 13519](#). These included: A July 5, 1995 memorandum in which the Assembly Committee on Appropriations stated that Senate Bill No. 132, proposing the changes ****425** to 13519, understood the “training requirement could have significant costs to local law enforcement in terms of expense and public safety, as most departments will be forced to backfill for offices while the officers are being trained or will have to forego the ***1182** backfilling and have fewer offices on patrol. Any monetary costs incurred by local law enforcement for the officer backfilling would be state-reimbursable.” The Committee noted that, “Although this bill states that the costs of the additional domestic violence training be absorbed by POST within existing resources, the reality is that this bill would create additional non-absorbable costs to POST since POST will be unable to exclude one type of training in favor of the domestic violence training, and instead will have to add this training to their current curriculum. The current curriculum of POST training is just as important to the maintaining of public safety as is the additional domestic violence training.”

In addition, the Department of Finance recognized the fiscal impact of [section 13519](#) on local law enforcement agencies, and opposed the adoption of Senate Bill No. 132. Diane M. Cummins, Deputy Director of the State Department of Finance, wrote to Senator Diane Watson on April 20, 1995, that, “This bill also specifies that training required pursuant to this measure ‘shall be funded from existing resources’, as specified. In so specifying, this bill would also require law enforcement agencies to modify existing training programs by increasing training requirements. Finance believes this bill contains a local mandate without providing necessary funding, thereby being in conflict with the California Constitution, which requires the state to fund local mandate costs. Although there is no specific information available regarding the level of additional costs which would be imposed on law enforcement agencies, the Department of Finance is opposed to legislation which would result in additional General Fund expenditures, given the State's ongoing fiscal constraints.” The Department of Finance recognized that, “Adding mandatory domestic violence training requirement would result in an additional unknown cost for specified state and local law enforcement agencies....”

Furthermore, Gretchen Fretter, Chair of the California Academy Directors' Association (an organization of training center directors and police academy managers throughout the state) wrote Senator Watson on March 9, 1995, to express the association's concerns with Senate Bill No. 132. Fretter's analysis indicated that the mandate would incur a \$300,000 price tag for each training cycle. The California State Sheriffs' Association also wrote to express concerns about Senate Bill No. 132, including that POST estimated the domestic violence training would add costs to local agencies of at least \$750,000 per year. Glen Fine, the Deputy Executive Director of POST, on July 11, 1997, wrote to the Department of Finance to inform it that POST understood that the author of Senate Bill No. 132 was aware of POST's training requirements of 24 hours every two years, and it was “the author's intent ... that domestic violence update training become a statutorily required priority for inclusion within this 24 hours of training every two years.”

***1183** POST issued a bulletin in February 1996 advising local law enforcement agencies of the new domestic violence training requirement.

The Department of Finance contended that the Legislature intended the domestic violence continuing education and training to be funded from existing resources. The department also contended that POST, which was charged with developing training ****426** standards for local law enforcement agencies, provided over \$21 million in existing state funds for domestic violence training. POST pointed out that the drafter of the statute recognized the 24 hours of continuing education every two years, and intended the domestic violence training to be a priority to be included within this 24-hour requirement.

At the hearing before the Commission on the test claim, representatives of the County testified that POST refused to pay for the programs, putting the burdens on local governments, and POST itself had estimated the annual cost of the program at \$750,000. A representative of the Sheriff's Department (Captain Dennis Wilson) testified that of the 24 hours required, any combination of courses could be used to meet the requirement. However, inclusion of the domestic violence training would take away two of those hours of training, resulting in only 22 hours. The Sheriff's Department would conduct domestic violence training even in the absence of the mandate; indeed, the Sheriff's Department actually conducted about 72 hours of training per officer per year. There was no funding for any of this training. The Sheriff's Department has 8,200 sworn officers, and two hours of training per officer adds up to 16,400 hours, which translates to 10 full-time officers for a year. Without funding for the domestic violence training, the Sheriff's Department therefore would lose the time equivalent of 10 officers for a year. Taking officers off the street impacts upon crime.

Martha Zavala testified on behalf of the County that the domestic violence training could not merely be subsumed within the 24 hours already required. With the training mandates already required by POST which exceed the 24-hour minimum, adding the domestic violence training only further exceeds the minimum 24 hours. There is no room to carve it out. Meeting POST requirements is not really an option. Thus, both the Sheriff's Department and the County agree they are seeking reimbursement of the costs of the training and the cost of replacing the officers on the street while in training.

A representative of POST testified that what POST provides in reimbursement to local law enforcement agencies is a small percentage of the real costs incurred. Where the training involved is through a telecourse, POST provides no reimbursement. There has been no increase in POST's budget since the amendment to [section 13519](#). About 30 of the courses provided by POST are mandated training.

***1184** A representative of the Department of Finance testified that the Department believed [section 13519](#) did not create state-mandated reimbursable program because the legislation indicated it was the Legislature's intent not increase the training costs of local government, and the training could be fit within the existing 24-hour requirements.

The Commission's staff prepared an analysis in advance of the hearing which found against the County. The "Staff Analysis" pointed out that [section 13519](#) was originally added by chapter 1609, Statutes of 1984.⁶ Originally, the statute required ****427** that POST develop and implement a basic course of instruction for the training of law enforcement officers in the handling of domestic violence complaints, with local law enforcement agencies encouraged, but not required, to provide updates. These provisions of the 1984 version were the subject of a test claim filed by the City of Pasadena in 1990. That claim was denied because the original statute did not require local agencies to implement or pay for a domestic violence training program, did not increase the minimum basic training course hours or advanced officer training hours, and did not require local agencies to provide domestic violence training pursuant to the POST skills and knowledge standards.

Legally, the Staff Analysis pointed out that in order for a statute to impose a reimbursable state-mandated program, the statutory language must (1) direct or obligate an activity or task upon local government entities, and (2) the required activity or task must be new or it must create an increased or higher level of service over the former required level of

service. (See, e.g., *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 56, 233 Cal.Rptr. 38, 729 P.2d 202.) The Staff Analysis concluded that [section 13519](#) did impose a new activity or program upon local law enforcement agencies. However, because the language of the statute requiring that the instruction be funded from existing resources, it was an open question whether the program imposed *mandated* costs. Because POST's minimum requirements remained at 24 hours before and after enactment of [section 13519](#), there were no increased training hours and costs associated with the domestic violence training course. Instead, the course should be accommodated or absorbed by ***1185** local law enforcement agencies within their existing resources available for training. Thus, the Staff Analysis recommended denial of the test claim.

After the public hearings were held, the Commission adopted the findings of the Staff Analysis. The Commission issued its own statement of decision which substantially adopted the findings of the Staff Analysis.

Subsequently, the County filed a petition for writ of mandate with the trial court, seeking vacation of the Commission's decision. The County argued that the domestic violence training constituted a state-mandated reimbursable program because it (1) was mandatory, while the POST certification training was optional; and (2) the only way local agencies could avoid the costs of the new program would be to redirect their efforts from the training they were already providing as part of POST training, thereby losing flexibility to design programs to suit their own needs.

The Commission argued that the County's focus on "redirected" manpower costs was misplaced. Instead, the focus should be on whether the local law enforcement agencies actually experience increased expenditure of their tax revenues. (See, e.g., *County of Sonoma v. Commission on State Mandates* (2000) 84 Cal.App.4th 1264, 1283, 101 Cal.Rptr.2d 784.) In *County of Sonoma*, the court stated that [California Constitution article XIII B, section 6](#) was designed to prevent the state from forcing programs on local governments, and such a forced program is one which results in "increased actual expenditures ****428** of limited tax proceeds that are counted against the local government's spending limit. [Section 6](#), located within a measure aimed at limiting expenditures, is expressly concerned with 'costs' incurred by local governments as a result of state-mandated programs, particularly when the costs of compliance with a new program restrict local spending in other areas." (*County of Sonoma*, at p. 1284, 101 Cal.Rptr.2d 784.) Because [section 13519](#) did not require the County to incur "actual increased costs" because the domestic violence training could be subsumed within the 24-hour POST training requirement, no state reimbursement was required.

The Commission also argued the state had not required the County to incur increased training costs for salaries of officers to receive the two-hour training. POST's requirements did not change as a result of [section 13519](#), and indeed, shortly after the enactment of [section 13519](#), POST forwarded a bulletin to local law enforcement agencies suggesting they include domestic violence training within the 24-hour continuing training requirement.

***1186** The trial court heard argument, after which the trial court adopted its tentative statement of decision in which it noted that, "Although it may be reasonable in some or even most cases for a deputy to eliminate an unrequired two-hour elective in favor of the required domestic violence instruction, what about cases where the County's needs and priorities would be affected detrimentally, if two hours of electives were taken away? At what point would additional mandated courses result in increased costs? [¶] The record also shows that, for some deputies, other state-required training already amounts to 24 hours or more per two-year period. For these deputies, the two hours of mandated domestic violence training cannot be accommodated by giving up other training but must be added on, for added cost. It appears that, if domestic violence instruction is to be funded from existing resources on a deputy-by-deputy basis, the County clearly does incur increased costs." The trial court granted the petition, and remanded the matter for consideration of the exact amount of increased costs.

DISCUSSION

I. STANDARD OF REVIEW.

[1] [2] [3] The determination whether the statute here at issue established a mandate under [California Constitution article XIII B, section 6](#), is a question of law. (*County of San Diego v. State of California* (1997) 15 Cal.4th 68, 109, 61 Cal.Rptr.2d 134, 931 P.2d 312.) Under [Government Code section 17559](#),⁷ administrative mandamus is the exclusive means to challenge a decision of the Commission on a subvention claim. (*Redevelopment Agency v. Commission on State Mandates* (1997) 55 Cal.App.4th 976, 980, 64 Cal.Rptr.2d 270.) “[Government Code section 17559](#) governs the proceeding below and requires that the trial court review the decision of the Commission under the substantial evidence standard. Where the substantial evidence test is applied by the trial court, we are generally confined to inquiring whether substantial evidence supports the court's findings and judgment. [Citation.] However, we independently review the superior court's legal **429 conclusions about the meaning and effect of constitutional and statutory provisions. [Citation.]” (*City of San Jose v. State of California* (1996) 45 Cal.App.4th 1802, 1810, 53 Cal.Rptr.2d 521.)

*1187 II. SECTION 13519'S IMPOSITION OF A DOMESTIC VIOLENCE TRAINING COURT IS NOT A STATE-MANDATED PROGRAM WITHIN THE MEANING OF [CONSTITUTION ARTICLE XIII B, SECTION 6](#) BECAUSE IT DOES NOT CONSTITUTE AN “INCREASED LEVEL OF SERVICE.”

[4] The Commission essentially makes two arguments. First, it contends that the County did not incur “increased costs.” Reimbursement to the County under [Constitution article XIII B, section 6](#) is not required unless there is a showing of actual increased costs mandated by the state. (See, e.g., *County of Los Angeles v. State of California, supra*, 43 Cal.3d at pp. 54–55, 233 Cal.Rptr. 38, 729 P.2d 202; *City of Sacramento v. State of California* (1990) 50 Cal.3d 51, 66–67, 266 Cal.Rptr. 139, 785 P.2d 522.) In *City of Sacramento*, the court explained that the statutory concept of “costs mandated by the state” and the constitutional concept of [article XIII B, section 6](#), are identical. (*City of Sacramento v. State of California, supra*, 50 Cal.3d at p. 67, fn. 11, 266 Cal.Rptr. 139, 785 P.2d 522.) Because of this limited, rather than broad definition, of “costs mandated by the state,” [article XIII B, section 6](#) does not provide reimbursement for every single increased cost. Thus, the trial court's finding that reimbursement was required where a statute results in a “redirection of local effort” or a “detrimental change in a local agency's needs and priorities” is not supported by the law. Rather, it constitutes an inappropriate injection of an equitable standard into the analysis.

Secondly, the Commission argues that no “mandate” exists. To the contrary, substantial evidence supports its finding that [section 13519](#) does not result in *increased* costs because nothing in the statute requires the County, or any other local law enforcement agency, to incur actual increased costs. The total number of hours required (the 24 minimum hours of POST training) did not increase because of the domestic violence training; rather, POST still requires 24 hours and in fact after the passage of [section 13519](#), POST forwarded a bulletin to law enforcement agencies recommending that they include domestic violence training within the 24-hour continuing professional training requirement. Because the POST standards are voluntary, if a local law enforcement agencies adds two hours of domestic violence training to either the POST requirement or its own requirements, it is doing so at its own discretion.

In response, the County points out that the Commission's conclusion is based upon the erroneous premise that local law enforcement agencies could escape increased costs simply by dropping two hours of their existing POST training and substituting the new domestic violence training. However, the evidence in the legislative history indicates that this was not the intent of the Legislature when it was considering [section 13519](#), nor was it the position of *1188 the Department of Finance. The County also contends that local law enforcement agencies incur costs when they sacrifice their existing training programs for the new domestic violence training. Although POST does not dictate those courses for which a local law enforcement agency must offer training and POST does pay for much of the training material, most of the cost of POST training is borne by the local law enforcement agencies in the form of personnel costs while deputies spend 24 hours of work time receiving **430 training. Furthermore, if a mere legislative directive to fund a new program with existing resources would let the state off the hook for reimbursement, then the constitutional rule of mandate reimbursement would be a nullity: any new state mandate can be funded by canceling other services. Because [California Constitution article XIII B, section 6](#) was designed to prevent the elimination of the fiscal freedom of local governmental agencies to

expend their limited available resources without being straightjacketed by state-mandated programs, the Commission's "within existing resources" rule would circumvent the purposes of [article XIII B, section 6](#).

A. The Purposes of California Constitution Article XIII B, Section 6 Guide Our Analysis.

[5] In 1978, the voters approved Proposition 13, which added article XIII A to the California Constitution. Article XIII A "imposes a limit on the power of state and local governments to adopt and levy taxes. [Citation.]" (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 486, 280 Cal.Rptr. 92, 808 P.2d 235.) In 1979, Proposition 4 added article XIII B to the Constitution, which imposed a complementary limit on governmental spending. (*San Francisco Taxpayers Assn. v. Board of Supervisors* (1992) 2 Cal.4th 571, 574, 7 Cal.Rptr.2d 245, 828 P.2d 147.) These two constitutional provisions "work in tandem, together restricting California government's power both to levy and to spend for public purposes." (*City of Sacramento v. State of California, supra*, 50 Cal.3d at p. 59, fn. 1, 266 Cal.Rptr. 139, 785 P.2d 522.) Their goal is to protect citizens from excessive taxation and government spending. (*County of Los Angeles v. State of California, supra*, 43 Cal.3d at p. 61, 233 Cal.Rptr. 38, 729 P.2d 202.)

[6] California Constitution article XIII B, section 6, provides in relevant part: "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service." [Article XIII B, section 6](#), prevents the state from shifting financial responsibility for carrying out governmental functions to local agencies, which are "ill equipped" to assume increased financial responsibilities because of the taxing and spending limitations of articles XIII A and XIII B. (*County of Fresno v. State of California, supra*, 53 Cal.3d at p. 487, 280 Cal.Rptr. 92, 808 P.2d 235.) Section 6 thus requires the state "to pay for any new *1189 governmental programs, or for higher levels of service under existing programs, that it imposes upon local governmental agencies. [Citation.]" (*Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1564, 1577, 15 Cal.Rptr.2d 547.)

[7] [8] [9] [10] [11] [12] [13] State mandate jurisprudence has established that in general, local agencies are not entitled to reimbursement of all increased costs mandated by state law, but only those resulting from a "new" program or an "increased level of service" imposed upon them by the state. (*Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 835, 244 Cal.Rptr. 677, 750 P.2d 318.) A "program" is defined as a program which carries out the "governmental function of providing services to the public, or laws which, to implement a state policy, impose unique requirements on local governments and do not apply generally to all residents and entities in the state." (*County of Los Angeles v. State of California, supra*, 43 Cal.3d at p. 56, 233 Cal.Rptr. 38, 729 P.2d 202.) A program is "new" if the local governmental entity had not previously been required to **431 institute it. (*City of San Jose v. State of California, supra*, 45 Cal.App.4th at p. 1812, 53 Cal.Rptr.2d 521.) State mandates are requirements imposed on local governments by legislation or executive orders. (*County of Los Angeles v. State of California, supra*, 43 Cal.3d at p. 50, 233 Cal.Rptr. 38, 729 P.2d 202.) Since the purpose of California Constitution article XIII B, section 6 is to avoid governmental programs from being forced on localities by the state, programs which are not unique to the government do not qualify; the programs must involve the provision of governmental services. (*City of Sacramento v. State of California, supra*, 50 Cal.3d at p. 68, 266 Cal.Rptr. 139, 785 P.2d 522.) Further, in order for a state mandate to be found, the local governmental entity must be required to expend the proceeds of its tax revenues. (*Redevelopment Agency of the City of San Marcos v. Commission on State Mandates, supra*, 55 Cal.App.4th at p. 986, 64 Cal.Rptr.2d 270.) Lastly, there must be compulsion to expend revenue. (*City of Merced v. State of California* (1984) 153 Cal.App.3d 777, 780, 783, 200 Cal.Rptr. 642 [revisions to Code of Civil Procedure required entities exercising the power of eminent domain to compensate businesses for lost goodwill did not create state mandate, because the power of eminent domain was discretionary, and need not be exercised at all]; *Department of Finance v. Commission on State Mandates* (2003) 30 Cal.4th 727, 134 Cal.Rptr.2d 237, 68 P.3d 1203.) In *Lucia Mar*, the court explained [article XIII B, section 6](#). "The intent of the section would plainly be violated if the state could, while retaining administrative control of programs it has supported with state tax money, simply shift the cost of the programs to local government on the theory that the shift does not violate [section 6 of article XIII B](#) because the programs are not 'new.'" (*Lucia Mar Unified School District v. Honig, supra*, 44 Cal.3d at p. 836, 244 Cal.Rptr. 677, 750 P.2d 318.)

However, in spite of all of the above, “increased level of service” is not defined in [California Constitution article XIII B, section 6](#) or in the ballot materials. *1190 (*Long Beach Unified School District v. State of California* (1990) 225 Cal.App.3d 155, 173, 275 Cal.Rptr. 449.) Furthermore, “Although a law is addressed only to local governments and imposes new costs on them, it may still not be a reimbursable state mandate.” (*City of Richmond v. Commission on State Mandates* (1998) 64 Cal.App.4th 1190, 1197, 75 Cal.Rptr.2d 754.)

In *City of San Jose v. State of California*, *supra*, 45 Cal.App.4th 1802, 53 Cal.Rptr.2d 521, [Government Code section 29550](#) authorized counties to charge cities and other local entities for costs of booking into county jails persons who had been arrested by employees of the cities and other entities. (45 Cal.App.4th at p. 1806, 53 Cal.Rptr.2d 521.) The State argued the measure merely reallocated booking costs, no shifting from state to local entities, therefore not within [article XIII B, section 6](#). (45 Cal.App.4th at p. 1806, 53 Cal.Rptr.2d 521.) The city contended counties function as agents of the state, charged with enforcement of state's criminal laws; detaining and booking integral part of this process. (*Id.* at p. 1808, 53 Cal.Rptr.2d 521.) The Commission found maintenance of jails and detention of prisoners, had always been a local matter, and cities and counties were both forms of local government; therefore, there was no shift in costs between state and local entities.

Furthermore, the terms of [Government Code section 29550](#) were discretionary, not mandatory. (*City of San Jose v. State of California*, *supra*, 45 Cal.App.4th at pp. 1808–1809, 53 Cal.Rptr.2d 521.) *City of San Jose* found no cost had been improperly transferred to the local government **432 entities because the cost of capture, detention and housing of persons charged with crimes had traditionally been borne by the counties. (*Id.* at p. 1813, 53 Cal.Rptr.2d 521.) *City of San Jose* rejected the cities' argument that the county was acting as agent of the state because it was “not supported by recent case authority, nor does it square with definitions particular to subvention analysis.” (*Id.* at p. 1814, 53 Cal.Rptr.2d 521.) California Constitution article XIII B treated cities and counties alike; [Government Code section 17514](#) defines “costs mandated by the state” to mean any increased costs that a “local agency” is required to incur. Because both cities and counties were to be treated alike for purposes of subvention analysis, nothing in [article XIII B, section 6](#) prohibits the shifting of costs between local government entities. (*City of San Jose*, at p. 1815, 53 Cal.Rptr.2d 521.)

In *County of Los Angeles v. State of California*, *supra*, 43 Cal.3d 46, 233 Cal.Rptr. 38, 729 P.2d 202, [Labor Code sections 4453, 4453.1 and 4460](#), increased the maximum weekly wage upon which temporary and permanent disability indemnity was computed from \$231 to \$262.50 per week. In addition, [Labor Code section 4702](#) increased certain death benefits from \$55,000 to \$75,000. The trial court held that because the changes did not exceed costs of living changes, they did not create an “increased level of service.” (43 Cal.3d at p. 52, 233 Cal.Rptr. 38, 729 P.2d 202.) The County argued the terms of [California Constitution article XIII B, section 6](#), do not contain an exception for increased costs which do not exceed the inflation rate. (43 Cal.3d at p. 53, 233 Cal.Rptr. 38, 729 P.2d 202.) The County relied on certain repealed Revenue and *1191 Taxation Code definitions which had equated any program which imposed “additional costs” as being within the constitutional provision of “increased level of service.” (*Id.* at p. 53, 233 Cal.Rptr. 38, 729 P.2d 202.) *County of Los Angeles* rejected this interpretation. “If the Legislature had intended to continue to equate ‘increased level of service’ with ‘additional costs,’ then the provision would be circular: ‘costs mandated by the state’ are defined as ‘increased costs’ due to an ‘increased level of service,’ which, in turn, would be defined as ‘additional costs.’” (*Id.* at p. 55, 233 Cal.Rptr. 38, 729 P.2d 202.) An examination of the language of [California Constitution article XIII B, section 6](#) shows that “‘by itself, the term ‘higher level of service’ is meaningless.” *Id.* at p. 56, 233 Cal.Rptr. 38, 729 P.2d 202. Rather, it must be read in conjunction with the phrase “‘new program.’” *Ibid.* “Thus read, it is apparent that the subvention requirement for increased or higher level of service is directed to state mandated increases in the services provided by local agencies in existing ‘programs.’” (*Ibid.*) By “‘program,’” the voters meant “‘programs that carry out the governmental function of providing services to the public, or laws which, to implement a state policy, imposed unique requirements on local governments and do not apply generally to all residents and entities in the state.’” (*Ibid.*) 233 Cal.Rptr. 38, 729 P.2d 202.) The ballot materials provided that [article XIII B, section 6](#) would “not allow the state government to force programs on local governments without the state paying for them.” (43 Cal.3d at p. 56, 233 Cal.Rptr. 38, 729 P.2d 202.) “Laws of

general application are not passed by the Legislature to ‘force’ programs on localities.” (*Id.* at p. 57, 233 Cal.Rptr. 38, 729 P.2d 202.) In light of this, “[t]he language of section 6 is far too vague to support an inference that it was intended that each time the Legislature passes a law of general application it must discern the likely effect on local governments and provide an appropriation to pay **433 for any incidental increase in local costs.... If the electorate had intended such a far-reaching construction of section 6, the language would have explicitly indicated that the word ‘program’ was being used in such a unique fashion.” (*Id.* at p. 57, 233 Cal.Rptr. 38, 729 P.2d 202.) Therefore, there was no need to pay for increase in worker's compensation, because it is not a program administered by local agencies to provide service to the general public. Local government entities are indistinguishable in this respect from private employers. (*Id.* at pp. 57–58, 233 Cal.Rptr. 38, 729 P.2d 202.)

In *City of Sacramento v. State of California*, *supra*, 50 Cal.3d 51, 266 Cal.Rptr. 139, 785 P.2d 522, chapter 2 of Statutes of 1978 extended mandatory coverage under the state's unemployment insurance laws to include state and local governments and nonprofit organizations. *City of Sacramento* held there was no obligation on the part of the state to provide funds because there was no “unique” obligation imposed upon local governments, nor was there any requirement of new or increased governmental services. (50 Cal.3d at p. 57, 266 Cal.Rptr. 139, 785 P.2d 522.) As the court stated, the measure was adopted to conform California's system to federal laws. (*Id.* at p. 58, 266 Cal.Rptr. 139, 785 P.2d 522.) Because the measure required local governments to provide unemployment benefits to their own employees, the state had not compelled provision of a new or increased level of service to the public at the local level. Rather, it had merely required local government to provide the same benefits as private *1192 employers. (*Id.* at p. 67, 266 Cal.Rptr. 139, 785 P.2d 522.) The purpose of California Constitution article XIII B, section 6 was to avoid governmental programs from being forced on localities by the state: Therefore, programs which are not unique to the government do not qualify. (50 Cal.3d at p. 67, 266 Cal.Rptr. 139, 785 P.2d 522.) The benefits at issue here have nothing to do with the provision of governmental services, and are therefore not within the scope of section 6. (50 Cal.3d at p. 68, 266 Cal.Rptr. 139, 785 P.2d 522.)

In *Lucia Mar Unified School District v. Honig*, *supra*, 44 Cal.3d 830, 244 Cal.Rptr. 677, 750 P.2d 318, Education Code section 59300 required school districts to contribute part of the cost of educating pupils from the district at state schools for the severely handicapped. *Lucia Mar* held section 59300 constituted a “new” program of higher level of service because cost of program had been shifted from the state to a local entity. “The intent of the section would plainly be violated if the state could, while retaining administrative control of programs it has supported with state tax money, simply shift the cost of the programs to local government on the theory that the shift does not violate section 6 of [California Constitution] article XIII B because the programs are not ‘new.’ ” (44 Cal.3d at p. 836, 244 Cal.Rptr. 677, 750 P.2d 318.)

On the other hand, in *County of San Diego v. State of California*, *supra*, 15 Cal.4th 68, 61 Cal.Rptr.2d 134, 931 P.2d 312, pursuant to 1982 legislation, the state withdrew from counties Medi-Cal funding for medically indigent persons (MIP's). (*Id.* at pp. 79–80, 61 Cal.Rptr.2d 134, 931 P.2d 312.) To offset this change in coverage, the state set up an account as a mechanism to transfer state funds to counties to pay for Medi-Cal expenses, and sufficient funds had been available in this account to enable the state to fully fund San Diego County's Medi-Cal costs. (*Id.* at p. 80, 61 Cal.Rptr.2d 134, 931 P.2d 312.) However, in fiscal year 1990–1991, insufficient funds were available. (*Ibid.*) The state argued that no mandate for reimbursement existed because the counties had always borne the responsibility of paying for indigent medical care pursuant to Welfare & Institutions Code section 17000. (*County of San Diego*, at pp. 91–92, 61 Cal.Rptr.2d 134, 931 P.2d 312.) In finding **434 reimbursement was mandated, the Supreme Court found that at the time California Constitution article XIII B, section 6 was enacted, the state was fully funding Medi-Cal for MIP's and the County bore no responsibility for those costs. (*County of San Diego*, at p. 93, 61 Cal.Rptr.2d 134, 931 P.2d 312.) Thus, in enacting Medi-Cal, the Legislature had shifted the cost of indigent medical care from the counties to the state. (*Id.* at pp. 96–97, 61 Cal.Rptr.2d 134, 931 P.2d 312.) Given this background, the Legislature excluded MIP's from Medi-Cal, knowing full well that it would trigger the counties' obligation to pay for medical care as providers of last resort. (*Id.* at p. 98, 61 Cal.Rptr.2d 134, 931 P.2d 312.) Therefore, the 1982 legislation “mandated a ‘ ‘new program’ ’ on counties

by ‘compelling them to accept financial responsibility in whole or in part for a program,’ i.e., medical care for adult MIP’s, ‘which was funded entirely by the state before the advent of [article XIII B](#).’ ” (*County of San Diego v. State of California*, [supra](#), 15 Cal.4th 68 at p. 98, 61 Cal.Rptr.2d 134, 931 P.2d 312, citing *Lucia Mar Unified School District v. Honig*, [supra](#), 44 Cal.3d at p. 836, 244 Cal.Rptr. 677, 750 P.2d 318.) Otherwise, “ ‘County taxpayers would be forced to accept new taxes or see the county *1193 forced to cut existing programs further....’ ” (*County of San Diego v. State of California*, [supra](#), 15 Cal.4th 68 at p. 98, 61 Cal.Rptr.2d 134, 931 P.2d 312.)

The Commission relies heavily on *County of Sonoma v. Commission on State Mandates*, [supra](#), 84 Cal.App.4th 1264, 101 Cal.Rptr.2d 784. In *County of Sonoma*, the challenged legislation added [section 97.03](#) to the Revenue and Taxation Code, and reduced the amount of property tax revenue to be allocated to local government pursuant to a formula, allocating an equal portion to a “Educational Revenue Augmentation Fund (ERAF)” for distribution to school districts. (84 Cal.App.4th at pp. 1269–1270, 1275, 101 Cal.Rptr.2d 784.) The net effect of the legislation was to decrease counties’ tax revenues, although school revenues remained stable, and satisfied the constitutional necessity of maintaining a minimum level of funding for schools pursuant to California Constitution article XIV, section 8. (84 Cal.App.4th at p. 1276, 101 Cal.Rptr.2d 784.) In *County of Sonoma*, the County argued that the reallocation of tax revenues constituted a state-mandated cost of a new program. (*Id.* at p. 1276, 101 Cal.Rptr.2d 784.) The court held that [section 6](#) subvention was limited to “increases in actual costs.” Because none of the County’s tax revenues were expended, the legislation did not come within [section 6](#). “Proposition 4 [the initiative enacting [article XIII B](#)] was aimed at controlling and capping government spending, not curbing changes in revenue allocations. [Section 6](#) is an obvious [complement] to the goal of Proposition 4 in that it prevents the state from forcing extra programs on local governments in a manner that negates their careful budgeting of expenditures. A forced program that would negate such planning is one that results in increased actual expenditures of limited tax proceeds that are counted against the local government’s spending limit. [Section 6](#), located within a measure aimed at limiting expenditures, is expressly concerned when ‘costs’ incurred by local government as a result of state-mandated programs, particularly with the costs of compliance with a new program *restrict local spending in other areas*.” (84 Cal.App.4th at pp. 1283–1284, 101 Cal.Rptr.2d 784 (emphasis added).)

County of Sonoma discerned a further requirement of [California Constitution article XIII B, section 6](#): that the costs incurred must involve programs previously funded exclusively by the state. In imposing this limitation, *County of Sonoma* relied on language in **435 *County of San Diego v. State of California*, [supra](#), 15 Cal.4th 68, 61 Cal.Rptr.2d 134, 931 P.2d 312 that “[section 6](#) prohibits the state from shifting to counties the costs of state programs for which the state assumed complete financial responsibility before adoption of [section 6](#).” (*County of San Diego v. State of California*, [supra](#), 15 Cal.4th 68 at p. 99, fn. 20, 61 Cal.Rptr.2d 134, 931 P.2d 312.) *County of Sonoma* determined that because the statute at issue only involved a reallocation of funds between entities already jointly responsible for providing a service (education), no state-mandated reimbursable program existed. (*County of Sonoma v. Commission on State Mandates*, [supra](#), 84 Cal.App.4th at p. 1289, 101 Cal.Rptr.2d 784.)

[14] [15] [16] *1194 Based upon the principles discernable from the cases discussed, we find that in the instant case, the legislation does not mandate a “higher level of service.” In the case of an existing program, an increase in existing costs does not result in a reimbursement requirement. Indeed, “costs” for purposes of [California Constitution article XIII B, section 6](#), does not equal every increase in a locality’s budget resulting from compliance with a new state directive. Rather, the state must be attempting to divest itself of its responsibility to provide fiscal support for a program, or forcing a new program on a locality for which it is ill-equipped to allocate funding.

We agree that POST certification is, for all practical purposes, not a “voluntary” program and therefore the County must, in order to comply with [section 13519](#), add domestic violence training to its curriculum. POST training and certification is ongoing and extensive, and local law enforcement agencies may chose from a menu of course offerings to fulfill the 24–hour requirement. Adding domestic violence training obviously may displace other courses from the menu, or require the adding of courses. Officer downtime will be incurred. However, merely by adding a course requirement to POST’s certification, the state has not shifted from itself to the County the burdens of state government. Rather, it has directed

local law enforcement agencies to reallocate their training resources in a certain manner by mandating the inclusion of domestic violence training.

Furthermore, the state has not shifted from itself the cost of a program previously administered and funded by the state. Instead, the state is requiring certain courses to be placed within an already existing framework of training. This loss of “flexibility” does not, in and of itself, require the County to expend funds that previously had been expended on the POST program by the state. Instead, “[t]he purpose for which state subvention of funds was created, to protect local agencies from having the state transfer its cost of government from itself to the local level, is therefore not brought into play” by a directive that POST-certified studies include domestic violence training. (*Redevelopment Agency of the City of San Marcos v. Commission on State Mandates*, *supra*, 55 Cal.App.4th at p. 986, 64 Cal.Rptr.2d 270.) Any increased costs are merely “incidental” to the cost of administering the POST certification.

[17] [18] While we are mindful that legislative disclaimers, findings and budget control language are not determinative to a finding of a state-mandated reimbursable program (*Carmel Valley Fire Protection District v. State of California* (1987) 190 Cal.App.3d 521, 541, 234 Cal.Rptr. 795), our interpretation is supported by the hortatory statutory language that, “The instruction required pursuant to this subdivision shall be funded from existing resources available for the training required pursuant to this section. It is the intent of the Legislature not to increase **436 the annual training costs of local *1195 government entities.” (§ 13519.) Thus, while the County may lose some flexibility in tailoring its training programs, such loss of flexibility does not rise to the level of a state-mandated reimbursable program because the loss of flexibility is incidental to the greater goal of providing domestic violence training. Every increase in cost that results from a new state directive does not automatically result in a valid subvention claim where, as here, the directive can be complied with by a minimal reallocation of resources within the entity seeking reimbursement. Thus, while there may be a mandate, there are no increased costs mandated by [section 13519](#).

DISPOSITION

The judgment of the trial court is reversed. The trial court is directed to enter a new and different judgment denying the County's petition for writ of mandate and reinstating the findings of the Commission.

We concur: [PERLUSS](#), P.J., and [WOODS](#), J.

All Citations

110 Cal.App.4th 1176, 2 Cal.Rptr.3d 419, 03 Cal. Daily Op. Serv. 6658, 2003 Daily Journal D.A.R. 8347

Footnotes

* Judge of the Los Angeles Superior Court assigned by the Chief Justice pursuant to [article VI, section 6 of the California Constitution](#).

1 Hereafter [section 13519](#).

2 The currently enacted version of this provision is found at [section 13519](#), subdivision (g), and reads, “Each law enforcement officer below the rank of supervisor who is assigned to patrol duties and would normally respond to domestic violence calls or incidents of domestic violence shall complete, every two years, an updated course of instruction on domestic violence that is developed according to the standards and guidelines developed pursuant to subdivision (d). The instruction required pursuant to this subdivision shall be funded from existing resources available for the training required pursuant to this section. It is the intent of the Legislature not to increase the annual training costs of local government entities.” (Stats.1998, ch. 701, § 1, designated the paragraph following subd. (a) as subd. (b) and redesignated the remaining subdivisions accordingly; in

redesignated subd. (c), inserted par. (5), listing the signs of domestic violence as an instruction topic, and redesignated pars. (5) to (16) as pars. (6) to (17).)

- 3 [Penal Code section 13510](#), subdivision (a), provides in relevant part: “For the purpose of raising the level of competence of local law enforcement officers, [POST] shall adopt, and may from time to time amend, rules establishing minimum standards relating to physical, mental, and moral fitness that shall govern the recruitment of any city police officers, peace officer members of a county sheriff’s office, marshals or deputy marshals of a municipal court, peace officer members of a county coroner’s office....”
- 4 The test claim also challenged the incident-reporting requirements of [Penal Code section 13730](#), which imposed a new program upon local law enforcement agencies to include in the domestic violence incident report additional information regarding the use of alcohol and controlled substances by the alleged abuser, and any prior domestic violence responses to the same address. The County did not contest the Commission’s outcome relating to this portion of the test claim, and therefore this issue is not before us on appeal.
- 5 In 1984, the Legislature created a statutory procedure for determining whether a statute imposes state-mandated costs on a local agency within the meaning of California Constitution article XII B, section 6. (See [Gov.Code, § 17500 et seq.](#)) The local agency files a test claim with the Commission, which holds a public hearing and determines whether the statute mandates a new program or increased level of service. ([Gov.Code, §§ 17521, 17551, 17555.](#)) If the Commission finds that a claim is reimbursable, it then determines the amount of reimbursement. ([Gov.Code, § 17557.](#)) The local agency then follows statutory procedures to obtain reimbursement. (See [Gov.Code, § 17558 et seq.](#)) Where the Commission finds no reimbursable mandate, the local agency can challenge this finding by administrative mandate proceedings under [Code of Civil Procedure section 1094.5](#). (See [Gov.Code, § 17552](#) [these provisions “provide the sole and exclusive procedure by which a local agency ... may claim reimbursement for costs mandated by the state as required by Section 6”].)
- 6 The history of [section 13519](#) is as follows: Added by Statutes 1984, chapter 1609, section 2, pages 5711–5713. Amended by Statutes 1985, chapter 281, section 1, pages 1305–1306, effective July 26, 1985; Statutes 1989, chapter 850, section 3; Statutes 1991, chapter 912 (Sen. Bill No. 421), section 1, pages 4086–4088; Statutes 1993, chapter 1098 (Assem. Bill No. 1268), section 8, pages 6162–6163; Statutes 1995, chapter 965 (Sen. Bill No. 132), section 1, pages 7377–7380; Statutes 1998, chapter 606 (Sen. Bill No.1880), section 13; Statutes 1998, chapter 701 (Assem. Bill No. 2172), section 1; Statutes 1999, chapter 659 (Sen. Bill No. 355), section 4. The 1995 amendment, at issue here, rewrote subdivision (e), which prior to amendment read: “(e) Forty thousand dollars (\$40,000) is appropriated from the Peace Officers Training Fund [POST] in augmentation of Item 8120–001–268 of the Budget Act of 1984, to support the travel, per diem, and associated costs for convening the necessary experts.” (Stats.1993, ch. 1098, § 8, p. 6188.)
- 7 [Government Code section 17559](#), subd. (b), provides: “A claimant or the state may commence a proceeding in accordance with the provisions of [Section 1094.5 of the Code of Civil Procedure](#) to set aside a decision of the commission on the ground that the commission’s decision is not supported by substantial evidence. The court may order the commission to hold another hearing regarding the claim and may direct the commission on what basis the claim is to receive a rehearing.”

ATTACHMENT 31

188 Cal.App.4th 794
Court of Appeal, Third District, California.

CLOVIS UNIFIED SCHOOL DISTRICT et al., Plaintiffs and Appellants,

v.

John CHIANG, as State Controller, etc., Defendant and Appellant.

No. Co61696.

|

Sept. 21, 2010.

|

As Modified on Denial of Rehearing Oct. 14, 2010.

Synopsis

Background: School districts and community college districts brought action against State Controller's Office for declaratory and writ relief challenging auditing rules used in reducing state-mandated reimbursement claims for employee salary and benefit costs. The Superior Court, Sacramento County, No. 06CS00748 and 07CS00263, [Lloyd G. Connelly, J.](#), invalidated the Contemporaneous Source Document Rule (CSDR) as applied to Intradistrict Attendance Program and Collective Bargaining Program, granted no relief as to CSDR as applied to the School District of Choice Program (SDC) and the Emergency Procedures, Earthquake Procedures and Disasters Program (EPEPD), and upheld the Health Fee Rule. Plaintiffs appealed.

Holdings: The Court of Appeal, [Butz, J.](#), held that:

[1] CSDR implemented, interpreted, or made specific the regulatory Parameters and Guidelines (P&Gs) applied to state-mandated reimbursement claims;

[2] declaratory and traditional mandate relief was appropriate form of relief for use of CSDR as underground regulation; and

[3] amount of optional student fee was deducted from amount reimbursed to community college districts for state-mandated costs.

Reversed in part with directions and affirmed in part.

West Headnotes (14)

- [1] **Declaratory Judgment** 🔑 Limitations and laches
- Mandamus** 🔑 Time to Sue, Limitations, and Laches
- States** 🔑 State expenses and charges and statutory liabilities

School districts' and community college districts' action against State Controller's Office, for declaratory and writ relief challenging audits that reduced state-mandated reimbursement claims for employee salary and benefit costs based on an auditing rule which was an invalid underground regulation in violation of the state

Administrative Procedure Act (APA), was subject to the three-year statute of limitations for lawsuits based on statutory liability, since state-mandated reimbursement was a statutory liability. [West's Ann.Cal.C.C.P. § 338\(a\)](#); [West's Ann.Cal.Gov.Code §§ 11340 et seq., 17500 et seq.](#)

[1 Cases that cite this headnote](#)

[2] Administrative Law and Procedure 🔑 [Nature and Scope](#)

An Administrative Procedure Act (APA) regulation has two principal characteristics: it must apply generally; and it must implement, interpret, or make specific the law enforced or administered by the agency, or govern the agency's procedure. [West's Ann.Cal.Gov.Code § 11342.600](#).

[1 Cases that cite this headnote](#)

[3] Administrative Law and Procedure 🔑 [Nature and Scope](#)

For a regulation to “apply generally,” as required to be subject to the Administrative Procedure Act (APA), the rule need not apply universally; a rule applies generally so long as it declares how a certain class of cases will be decided. [West's Ann.Cal.Gov.Code § 11342.600](#).

[Cases that cite this headnote](#)

[4] States 🔑 [Administration of finances in general](#)

State Controller's Office's Contemporaneous Source Document Rule (CSDR) applied generally, as required to be a regulation subject to the Administrative Procedure Act (APA), where the CSDR was applied generally to the auditing of reimbursement claims, and the Controller's auditors had no discretion to judge on a case-by-case basis whether to apply the CSDR. [West's Ann.Cal.Gov.Code § 11342.600](#).

[Cases that cite this headnote](#)

[5] States 🔑 [State expenses and charges and statutory liabilities](#)

State Controller's Office's Contemporaneous Source Document Rule (CSDR) implemented, interpreted, or made specific the regulatory Parameters and Guidelines (P&Gs) applied to state-mandated reimbursement claims for the School District of Choice (SDC) Program in effect before May 27, 2004, and thus was a regulation subject to the Administrative Procedure Act (APA), since there were substantive differences between the CSDR and the P&Gs then in effect; the CSDR barred the use of employee time declarations and certifications as source documents or equivalents even though the P&Gs had nothing to say on that subject, and the CSDR did not countenance the use of documented estimates even though such estimates were allowable under the P&Gs. [West's Ann.Cal.Gov.Code §§ 11342.600, 17557, 17558.5\(a\)](#); [West's Ann.Cal.Educ.Code § 48209.9](#) (Repealed).

[Cases that cite this headnote](#)

[6] States 🔑 [State expenses and charges and statutory liabilities](#)

State Controller's Office's Contemporaneous Source Document Rule (CSDR) implemented, interpreted, or made specific the regulatory Parameters and Guidelines (P&Gs) applied to state-mandated reimbursement claims for the Emergency Procedures, Earthquake Procedures and Disasters Program (EPEPD), and thus was a regulation subject to the Administrative Procedure Act (APA), since there were substantive differences between the CSDR and the P&Gs then in effect; unlike the P&Gs, the CSDR barred the use of employee time declarations and certifications as source documents, and the CSDR did not countenance the use of documented

estimates. [West's Ann.Cal.Gov.Code §§ 11342.600, 17557, 17558.5\(a\)](#); [West's Ann.Cal.Educ.Code §§ 35925–35927, 40041.5, 40042](#) (Repealed).

[Cases that cite this headnote](#)

[7] [States](#)  [State expenses and charges and statutory liabilities](#)

State Controller's Office's Contemporaneous Source Document Rule (CSDR) implemented, interpreted, or made specific the regulatory Parameters and Guidelines (P&Gs) applied to state-mandated reimbursement claims for the Intradistrict Attendance Program, and thus was a regulation subject to the Administrative Procedure Act (APA), since there were substantive differences between the CSDR and the P&Gs then in effect; unlike the P&Gs, the CSDR barred the use of time studies or employee time declarations and certifications as source documents. [West's Ann.Cal.Gov.Code §§ 11342.600, 17557, 17558.5\(a\)](#); [West's Ann.Cal.Educ.Code § 35160.5](#).

[Cases that cite this headnote](#)

[8] [States](#)  [State expenses and charges and statutory liabilities](#)

State Controller's Office's Contemporaneous Source Document Rule (CSDR) implemented, interpreted, or made specific the regulatory Parameters and Guidelines (P&Gs) applied to state-mandated reimbursement claims for the school district Collective Bargaining Program, and thus was a regulation subject to the Administrative Procedure Act (APA), since there were substantive differences between the CSDR and the P&Gs then in effect; unlike the P&Gs, the CSDR required source documents. [West's Ann.Cal.Gov.Code §§ 3540 et seq., 11342.600, 17557, 17558.5\(a\)](#).

[1 Cases that cite this headnote](#)

[9] [Declaratory Judgment](#)  [State officers and boards](#)

[Declaratory Judgment](#)  [Education](#)

[Mandamus](#)  [Establishment, maintenance, and management of schools](#)

Declaratory and accompanying traditional mandate relief was an appropriate form of relief, for school districts' challenge to State Controller's Office's policy of using an underground regulation to conduct audits in violation of the Administrative Procedure Act (APA), even though the underground regulation was later incorporated into valid regulations, where the dispute related to audit determinations under the invalid regulation which did not become final prior to the applicable statute of limitations, and there was no adequate administrative remedy because the Commission on State Mandates consistently refused to rule on underground regulation claims. [West's Ann.Cal.Gov.Code § 11350](#).

[2 Cases that cite this headnote](#)

[10] [Evidence](#)  [Administrative rules and regulations](#)

In appeal from trial court's partial grant of declaratory and writ relief against underground regulations used by State Controller's Office in reducing state-mandated reimbursement claims for employee salary and benefit costs, Court of Appeal would not take judicial notice of a subsequent amendment of the regulatory Parameters and Guidelines (P&Gs) applied to the reimbursement claims, which brought the underground regulations into compliance with the Administrative Procedure Act (APA) after the time period at issue in the lawsuit. [West's Ann.Cal.Gov.Code §§ 11340 et seq., 17500 et seq.](#)

[Cases that cite this headnote](#)**[11]** **Evidence**  [Official proceedings and acts](#)

In appeal from trial court's partial grant of declaratory and writ relief against underground regulations used by State Controller's Office in reducing school districts' and community college districts' state-mandated reimbursement claims for employee salary and benefit costs, Court of Appeal would not take judicial notice of the Commission on State Mandates Incorrect Reduction Claim caseload summary or the Controller's list of final audit reports for California school districts and community college districts. [West's Ann.Cal.Gov.Code § 17558.7\(a\)](#).

[1 Cases that cite this headnote](#)**[12]** **States**  [State expenses and charges and statutory liabilities](#)

Under the statutes requiring reimbursement to local government for state-mandated costs, the amount of an optional student health fee was deducted from the amount reimbursed to community college districts for the state-mandated cost of the Health Fee Elimination Program, even when districts chose not to charge their students those fees. [West's Ann.Cal.Gov.Code §§ 17514, 17556\(d\)](#); [West's Ann.Cal.Educ.Code § 76355\(a\)\(1\)](#); [§ 72246 \(Repealed\)](#).

See Cal. Jur. 3d, State of California, § 104; 9 Witkin, Summary of Cal. Law (10th ed. 2005) Taxation, § 121.

[Cases that cite this headnote](#)**[13]** **States**  [State expenses and charges and statutory liabilities](#)

To the extent a local agency or school district has the authority to charge for a state-mandated program or increased level of service, that charge cannot be recovered as a state-mandated cost. [West's Ann.Cal. Const. Art. 13B, § 6](#); [West's Ann.Cal.Gov.Code §§ 17514, 17556\(d\)](#).

[Cases that cite this headnote](#)**[14]** **States**  [State expenses and charges and statutory liabilities](#)

State Controller's Office had the authority to rely on the Government Code, rather than only on the Parameters and Guidelines (P&Gs) adopted by the Commission on State Mandates, to uphold an audit rule excluding the amount of optional fees from the amount recoverable as state-mandated costs. [West's Ann.Cal.Gov.Code §§ 17514, 17556\(d\)](#).

[Cases that cite this headnote](#)**Attorneys and Law Firms**

****36** [Lozano Smith, Gregory A. Wedner and Sloan R. Simmons](#), Sacramento, for Plaintiffs and Appellants.

[Richard L. Hamilton](#) for California School Boards Association and Its Education Legal Alliance, as Amicus Curiae on behalf of Plaintiffs and Appellants Clovis Unified School District, Fremont Unified School District, Newport–Mesa Unified School District, Norwalk–La Mirada Unified School District, Riverside Unified School District, San Juan Unified School District and Sweetwater Union High School District.

Edmund G. Brown, Jr., Attorney General, [Jonathan K. Renner](#), Assistant Attorney General, [Douglas J. Woods](#) and [Kathleen A. Lynch](#), Deputy Attorneys General, for Defendant and Appellant.

Opinion

[BUTZ, J.](#)

***797** This declaratory relief and writ of mandate action concerns the validity of two auditing rules used by defendant State Controller's Office (Controller). The Controller used these rules in reducing state-mandated reimbursement claims for employee salary and benefit costs submitted from plaintiff school districts and community college districts (hereafter plaintiffs).

Contemporaneous Source Document Rule (CSDR)

The first auditing rule is referred to by plaintiffs as the Contemporaneous Source Document Rule (CSDR). The Controller used this rule to reduce reimbursement claims for the following four state-mandated school district programs during the challenged period straddling fiscal years 1998 to 2003: (1) the School District of Choice Program (SDC); (2) the Emergency Procedures, Earthquake Procedures and Disasters Program (EPEPD); (3) the ***798** Intradistrict Attendance Program; and (4) the Collective Bargaining Program. We conclude this rule was an invalid underground regulation under the state Administrative Procedure Act (APA) during this period. ([Gov.Code, § 11340 et seq.](#))¹ Consequently, we overturn the Controller's audits for these four programs during this period to the extent they were based on this rule.

Health Fee Elimination Program: Health Fee Rule

The second auditing rule is the Health Fee Rule, which the Controller used to reduce reimbursement claims for state-****37** mandated health services provided by the plaintiff community college districts pursuant to the Health Fee Elimination Program. We uphold the validity of this rule.

The trial court: (1) invalidated the CSDR as applied to the Intradistrict Attendance and Collective Bargaining Programs (from which the Controller appeals); (2) hinted at the CSDR's invalidity as applied to the SDC and EPEPD Programs but did not grant relief thereon, apparently deeming the administrative remedy sufficient (from which the school districts appeal); and (3) upheld the validity of the Health Fee Rule (from which the community college districts appeal). We shall affirm the judgment regarding the Intradistrict Attendance Program, the Collective Bargaining Program, and the Health Fee Rule, but reverse the judgment, with directions, regarding the SDC and EPEPD Programs.

Because the issues raised in this appeal are almost entirely legal ones subject to our independent review (see [Grier v. Kizer](#) (1990) 219 Cal.App.3d 422, 434, 268 Cal.Rptr. 244, disapproved on a different ground in [Tidewater Marine Western, Inc. v. Bradshaw](#) (1996) 14 Cal.4th 557, 577, 59 Cal.Rptr.2d 186, 927 P.2d 296 (*Tidewater*) [whether an auditing rule is an APA regulation is a question of law]), it is unnecessary to set forth a factual background at this stage. Instead, we will proceed straight to our discussion. First, we will briefly summarize the process of state-mandated reimbursement and the concept of underground regulation. Then we will turn our attention to the programs and remedies at issue, weaving in the pertinent facts as we go.

DISCUSSION

I. State-mandated Reimbursement Process

In 1979, California's voters adopted [article XIII B, section 6 of the state Constitution](#), which specifies that if the state imposes any “new program *799 or higher level of service” on any local government (including a school district), the state must reimburse the locality for the costs of the program or increased level of service.

In 1984, the Legislature enacted statutes to govern the state mandate process. (§ 17500 et seq.) Under these statutes, the Commission on State Mandates (the Commission) determines, pursuant to a “test claim” process, whether a state program constitutes a reimbursable state mandate. (§§ 17551, subd. (c), 17553.)

Once the Commission determines that a state mandate exists, it adopts regulatory “[P]arameters and [G]uidelines” (P & G's) to govern the state-mandated reimbursement. (§ 17557.) The Controller, in turn, then issues nonregulatory “[C]laiming [I]nstructions” for each Commission-determined mandate; these instructions must derive from the Commission's test claim decision and its adopted P & G's. (§ 17558.) Claiming Instructions may be specific to a particular mandated program, or general to all such programs.

The Controller may audit a reimbursement claim filed by a local agency or school district within three years of the claim's filing or last amendment. (§ 17558.5, subd. (a).)

If the Controller reduces a specific reimbursement claim via an audit, the claimant may file an “[I]ncorrect [R]eduction [C]laim” with the Commission. (§ 17558.7, subd. (a).)

II. The Concept of Invalid Underground Regulation

[1] In their petitions for writ of mandate and complaints for declaratory relief, the school districts (comprising Clovis, **38 Fremont, Newport–Mesa, Norwalk–La Mirada, Riverside, Sweetwater, and San Juan; hereafter collectively, School Districts) allege that the CSDR constitutes an invalid, unenforceable underground regulation under the APA as applied by the Controller in auditing salary and benefit costs in reimbursement claims for the SDC, EPEPD, Intradistrict Attendance, and Collective Bargaining Programs during the applicable periods roughly encompassing the fiscal years 1998 to 2003.²

*800 In their petition for writ of mandate and complaint for declaratory relief (actually appended to the School Districts' petition and complaint), the community college districts (comprising San Mateo, Santa Monica, State Center, and El Camino; hereafter collectively, College Districts) allege that the Health Fee Rule constitutes an invalid, unenforceable underground regulation under the APA as applied by the Controller in auditing reimbursement claims for the Health Fee Elimination Program or, alternatively, that the Controller's auditing actions in this respect were beyond its lawful authority.

The basic legal principles that apply to these allegations are as follows:

“‘If a rule constitutes a “regulation” within the meaning of the APA (other than an “emergency regulation” ...) it may not be adopted, amended, or repealed except in conformity with “basic minimum procedural requirements” ’” which include public notice, opportunity for comment, agency response to comment, and review by the state Office of Administrative Law. (*Morning Star Co. v. State Bd. of Equalization* (2006) 38 Cal.4th 324, 333, 42 Cal.Rptr.3d 47, 132 P.3d 249 (*Morning Star*).) “These requirements promote the APA's goals of bureaucratic responsiveness and public engagement in agency rulemaking.” (*Ibid.*)

Any regulation “ ‘that substantially fails to comply with these requirements may be judicially declared invalid’ ” and is deemed unenforceable. (*Morning Star, supra*, 38 Cal.4th at p. 333, 42 Cal.Rptr.3d 47, 132 P.3d 249; § 11350, subd. (a).)

[2] A “regulation” under the APA “means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order, or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure.” (§ 11342.600.) As we will later explain more fully, an APA regulation has two principal characteristics: It must apply generally; and it must implement, interpret, or make specific the law enforced or administered by the agency, or govern the agency's procedure. (*Morning Star, supra*, 38 Cal.4th at pp. 333–334, 42 Cal.Rptr.3d 47, 132 P.3d 249; *Tidewater, **39 supra*, 14 Cal.4th at p. 571, 59 Cal.Rptr.2d 186, 927 P.2d 296.)

***801 III. The CSDR as Applied to the SDC, EPEPD, Intradistrict Attendance, and Collective Bargaining Programs**

We will start with the SDC Program. We do so because, of these four programs, the Commission's APA-valid, pre-May 27, 2004 P & G's for the SDC Program most closely resemble the Controller's CSDR.³ If we conclude, nevertheless, that the CSDR is an underground regulation that violates the APA in this context, we will have to conclude similarly for these three other programs. It is undisputed that the Controller's CSDR was not enacted in compliance with APA procedure.

As we shall explain, we conclude that the CSDR, as applied to the (pre-May 27, 2004) SDC Program, is an underground, unenforceable regulation under the APA. Accordingly, the CSDR is invalid as applied to the School Districts' SDC Programs for the applicable periods roughly encompassing the fiscal years 1998 to 2003 (see fn. 2, *ante*), and invalid in parallel fashion to the three other programs as well.

The Commission determined, in the mid–1990's, that the SDC Program imposed a reimbursable state-mandated program on school districts by establishing the right of parents/guardians of students, who were prohibited from transferring to another school district, to appeal to the county board of education. (See former [Ed.Code, § 48209.9](#), inoperative July 1, 2003.)

From August 24, 1995, until May 27, 2004, the Commission's P & G's for the SDC Program set forth the following two requirements for school districts seeking SDC state-mandated reimbursement for employee salary and benefit costs: (1) “Identify the employee(s) and their job classification, describe the mandated functions performed and specify the actual number of hours devoted to each function, the productive hourly rate and the related benefits. The average number of hours devoted to each function may be claimed if supported by a documented time study”; and (2) “For auditing purposes, all costs claimed must be traceable to source documents (e.g., employee time records, invoices, receipts, purchase orders, contracts, etc.) and/or worksheets that show evidence of and the validity of such claimed costs.”

The Commission's SDC Program P & G's divide the subject of reimbursable costs into three categories: employee salaries and benefits; materials and supplies; and contracted services. The examples set forth in these P & G's for *802 “source documents” align with these three categories: “employee time records” for employee salaries and benefits; “invoices,” “receipts” and “purchase orders” for materials and supplies; and “contracts” for contracted services. At issue in this appeal for the SDC, EPEPD, Intradistrict Attendance, and Collective Bargaining Programs are just the cost category of employee salaries and benefits.

From the initial issuance of the Commission's SDC Program P & G's in 1995 until May 27, 2004, the Controller's SDC-specific Claiming Instructions substantively aligned with the SDC Program P & G's.

However, in September 2003, the Controller revised its general Claiming Instructions (that apply to state-mandated reimbursement claims in general) to set **40 forth, for the first time, what has become known as the CSDR. The CSDR states:

“To be eligible for mandated cost reimbursement for any fiscal year, only actual costs may be claimed. Actual costs are those costs actually incurred to implement the mandated activities. Actual costs must be traceable and supported by source documents that show the validity of such costs, when they were incurred, and their relationship to the reimbursable activities. A source document is a document created at or near the same time the actual cost was incurred for the event or activity in question. Source documents may include, but are not limited to, employee time records or time logs, sign-in sheets, invoices, and receipts.

“Evidence corroborating the source documents may include, but is not limited to, worksheets, cost allocation reports (system generated), purchase orders, contracts, agendas, training packets, and declarations. Declarations must include a certification or declaration stating, ‘I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct based upon personal knowledge.’ Evidence corroborating the source documents may include data relevant to the reimbursable activities otherwise in compliance with local, state, and federal government requirements. However, corroborating documents cannot be substituted for source documents.”

Substantial evidence showed that prior to the use of the CSDR in Controller audits, school districts obtained SDC state-mandated reimbursement for employee salary and benefit costs based on (1) declarations and certifications from the employees that set forth, after the fact, the time they had spent on SDC-mandated tasks; or (2) an annual accounting of time determined by the number of mandated activities and the average time for each activity. After the Controller began using the CSDR in its auditing of SDC reimbursement claims, the Controller deemed these declarations, certifications, and accounting methods insufficient, and reduced the ***803** reimbursement claims accordingly. (Substantial evidence also showed that the Controller, in 2000, began applying a CSDR requirement in field audits of SDC reimbursement claims, before the CSDR was expressed in the Controller's general Claiming Instructions in September 2003 or adopted in the Commission's SDC Program P & G's on May 27, 2004.)

The question is whether the Controller's CSDR constituted an underground, unenforceable regulation that the Controller used in auditing the School Districts' SDC Program for the fiscal years 1998 to 2003, because the CSDR constituted a state agency regulation that was not adopted in conformance with the APA prior to its valid adoption in the Commission's SDC Program P & G's on May 27, 2004. We answer this question “yes.”

[3] “ ‘A regulation subject to the APA ... has two principal identifying characteristics. [Citation.] *First*, the agency must intend its rule to apply generally, rather than in a specific case. The rule need not, however, apply universally; a rule applies generally so long as it declares how a certain class of cases will be decided. [Citation.] *Second*, the rule must “implement, interpret, or make specific the law enforced or administered by [the agency], or ... govern [the agency's] procedure.” ’ ” (*Morning Star, supra*, 38 Cal.4th at pp. 333–334, 42 Cal.Rptr.3d 47, 132 P.3d 249, quoting *Tidewater, supra*, 14 Cal.4th at p. 571, 59 Cal.Rptr.2d 186, 927 P.2d 296, italics added.)

[4] As to the first criterion—whether the rule is intended to apply generally—substantial evidence supports the trial ****41** court's finding that the CSDR was “applie[d] generally to the auditing of reimbursement claims ...; the Controller's auditors ha[d] no discretion to judge on a case[-]by[-]case basis whether to apply the rule.” (The trial court made this finding in the context of ruling on the Intradistrict Attendance and Collective Bargaining Programs, but this finding is a general one that applies equally to the SDC Program. The trial court did not apply this general finding to the SDC Program only because the court reasoned that the CSDR was not an APA-violative underground regulation in the SDC context, as the Commission later adopted the CSDR into its SDC Program P & G's (see fn. 3, *ante*). As we shall explain later, we reject this reasoning involving subsequent adoption.)

[5] The CSDR also meets the second criterion of being a regulation: It implements, interprets, or makes specific the law enforced or administered by the Controller. The Controller argues, to the contrary, that the CSDR “merely restates” the source document requirement found in the pre-May 27, 2004 Commission P & G's for the SDC Program, and that “source documents” are, by their sourceful nature, contemporaneous. As we explain, we reject this argument.

Admittedly, the pre-May 27, 2004 SDC Program P & G's stated that, "[f]or auditing purposes, all costs claimed must be traceable to source documents *804 (e.g., employee time records, invoices, receipts, purchase orders, contracts, etc.) and/or worksheets that show evidence of and the validity of such claimed costs." However, the Controller's CSDR, in contrast to these P & G's, did not equate "source documents" with "worksheets," but relegated "worksheets" to the second-class status of "corroborating documents" that can only serve as evidence that corroborates "source documents." This is no small matter either. This is because, prior to the Controller using the CSDR to audit reimbursement claims, the School Districts, in making these claims, had used employee declarations and certifications and average time accountings to document the employee time spent on SDC-mandated activities; and such methods can be deemed akin to worksheets.

More significantly, the CSDR expressly states that employee declarations and certifications are only corroborating documents, *not* source documents; the pre-May 27, 2004 SDC Program P & G's had nothing to say on this subject. In effect, then, the CSDR bars the use of employee time declarations and certifications as source documents or source document-equivalent worksheets, in contrast to the pre-May 27, 2004 P & G's.

Along similar lines, the pre-May 27, 2004 SDC Program P & G's also stated that the "average number of [employee] hours devoted to each [mandated] function may be claimed if supported by a documented time study"; the record showed that such a time study is a documented estimate. The CSDR, which recognizes only actual costs traceable and supported by contemporaneous source documents, does not countenance such estimation.

Nor may the Controller point to the examples of the source documents listed in the pre-May 27, 2004 SDC Program P & G's and argue they show the contemporaneous nature of source documents: "employee time records, invoices, receipts, purchase orders, contracts, etc." First, this argument ignores the source document-equivalent of "worksheets" set forth in these P & G's, as discussed above. And, second, while the CSDR lists "employee time records," "invoices," and "receipts" as source documents, it specifies that "purchase orders," "contracts" (and "worksheets") **42 are only corroborating documents, not source documents.

Finally, the School Districts that had used employee declarations and certifications and average time accountings to document time for reimbursement claims also note that it is *now* physically impossible to comply with the CSDR's requirement of contemporaneousness that "[a] source document is a *805 document *created at or near the same time the actual cost was incurred* for the event or activity in question."⁴ (Italics added.)

Given these substantive differences between the Commission's pre-May 27, 2004 SDC Program P & G's and the Controller's CSDR, we conclude that the CSDR implemented, interpreted or made specific the following laws enforced or administered by the Controller: the Commission's pre-May 27, 2004 P & G's for the SDC Program (§ 17558) [the Commission submits regulatory P & G's to the Controller, who in turn issues nonregulatory Claiming Instructions based thereon]; and the Controller's statutory authority to audit state-mandated reimbursement claims (§ 17561, subd. (d)(2)).

Consequently, the CSDR meets the two criteria for being an APA regulation. And because the CSDR, as applied to the SDC Program, was not adopted as a regulation in compliance with the APA rule-making procedures until its May 27, 2004 incorporation into the SDC Program P & G's, this CSDR is an underground and unenforceable regulation as applied to the audits of the School Districts' SDC Programs for the applicable periods roughly encompassing the fiscal years 1998 to 2003. (See fn. 2, *ante*.) These audits are invalidated to the extent they used this CSDR.

[6] [7] [8] As we noted at the outset of this part of the opinion, if we were to conclude (as we now have done) that the CSDR is an underground regulation that violates the APA in the SDC Program context presented here, we would have to conclude similarly for the EPEPD, Intradistrict Attendance, and Collective Bargaining Programs too. This is because the Commission's P & G's for these latter three programs less resembled the Controller's CSDR than did the

Commission's pre-May 27, 2004 P & G's for the SDC Program. We now turn to the EPEPD, Intradistrict Attendance, and Collective Bargaining Programs, which we will describe briefly in order.

The EPEPD Program was found to be a reimbursable state-mandated program in 1987. This program requires school districts to establish earthquake procedures for each of its school buildings, and to allow use of its buildings, grounds and equipment for mass care and welfare shelters during public disasters or emergencies. (Former Ed.Code, §§ 35925–35927, [40041.5](#), [40042](#).)

806** From 1991 until June 2, 2003, the Commission's P & G's for the EPEPD Program required school districts seeking state-mandated reimbursement for employee salary and benefit costs: (1) to “provide a listing of each employee ... and the number of hours devoted to their [mandated] function”; and (2) “[f]or auditing purposes, all costs claimed may be *43** traceable to source documents and/or worksheets that show evidence of the validity of such costs.” The Controller's EPEPD-specific Claiming Instructions, since 1996, have stated that “Source documents required to be maintained by the [reimbursement] claimant may include, but are not limited to, employee time cards and/or cost allocation reports.” (The Commission, in like fashion to what it did with the SDC Program, incorporated the CSDR into its P & G's for the EPEPD Program, effective June 2, 2003.)

These pre-June 2, 2003 P & G's for the EPEPD Program parallel the pre-May 27, 2004 P & G's for the SDC Program, but even less resemble the Controller's CSDR than did those SDC Program P & G's. For the reasons set forth above involving the SDC Program, then, we conclude that the Controller's CSDR is an underground, unenforceable regulation as applied to the audits of the School Districts' EPEPD Programs for the applicable periods roughly encompassing the fiscal years 1998 to 2003. (See fn. 2, *ante*.) These audits are invalidated to the extent they used this CSDR.

The Intradistrict Attendance Program, in 1995, was found to be a reimbursable state-mandated program. This program establishes a policy of open enrollment within a school district for district residents. (Former [Ed.Code, § 35160.5](#).)

Since 1995, the Commission's P & G's for the Intradistrict Attendance Program have required school districts seeking state-mandated reimbursement for employee salary and benefit costs (1) to “[i]dentify the employee(s) and their job classification ... and specify the actual number of hours devoted to each [mandated] function.... The average number of hours devoted to each function may be claimed if supported by a documented time study”; and (2) “[f]or auditing purposes, all costs claimed must be traceable to source documents and/or worksheets that show evidence of the validity of such costs.” For the 1998 to 2003 period of fiscal years at issue, the Controller's Intradistrict Attendance Program-specific Claiming Instructions substantively mirrored P & G's for (1) above (except for the “average number of hours” provision), and stated as to source documents: “Source documents required to be maintained by the claimant may include, but are not limited to, employee time records that show the employee's actual time spent on this mandate.” (In early 2010, the Commission incorporated the Controller's CSDR into the Intradistrict Attendance Program P & G's; see fn. 5, *post*.)

***807** Applying the same reasoning we have applied above with respect to the SDC and the EPEPD Programs, we conclude that the Controller's CSDR is an underground, unenforceable regulation as applied to the audits of the School Districts' Intradistrict Attendance Programs for the applicable periods roughly encompassing the fiscal years 1998 to 2003. (See fn. 2, *ante*.) These audits are invalidated to the extent they used this CSDR.

That leaves the Collective Bargaining Program, which was found to be a reimbursable state-mandated program in 1978 (by the Commission's predecessor, the State Board of Control). This program requires school district employers to collectively bargain with represented employees, and to publicly disclose the major provisions of their agreements prior to final adoption. ([§ 3540 et seq.](#))

If the Commission's pre-May 27, 2004 P & G's for the SDC Program most closely resemble the Controller's CSDR, the P & G's for the Collective Bargaining Program bear the least resemblance. As pertinent, the Collective Bargaining

Program P & G's require school districts seeking reimbursement ****44** for employee salary and benefit costs to simply “[s]upply workload data requested ... to support the level of costs claimed” and “[s]how the classification of the employees involved, amount of time spent, and their hourly rate”; nothing is said about “source documents.” The Controller's Collective Bargaining Program-specific Claiming Instructions substantively mirror those of the Intradistrict Attendance Program, stating that source documents include employee time records that show the employee's actual time spent on the mandated function. (And as with the Intradistrict Attendance Program, the Commission, in early 2010, incorporated the Controller's CSDR into the Collective Bargaining Program P & G's; see fn. 5, *post.*)

Consequently, employing the same reasoning we have employed above, we conclude that the Controller's CSDR is an underground, unenforceable regulation as applied to the audits of the School Districts' Collective Bargaining Programs for the applicable periods roughly encompassing the fiscal years 1998 to 2003. (See fn. 2, *ante.*) These audits are invalidated to the extent they used this CSDR.

IV. Declaratory and Related Writ of Mandate Relief

The trial court declared that the Controller's CSDR, as applied to the audits of the Intradistrict Attendance and Collective Bargaining Programs for the 1998 to 2003 period of fiscal years, was an invalid and void underground regulation under the APA. Correspondingly, the trial court issued a preemptory writ of mandate (traditional mandamus) invalidating these CSDR-based audits to the extent they were not final audit determinations for more than ***808** three years before the School Districts filed their respective lawsuits on May 23, 2006 (Clovis et al.) and March 2, 2007 (San Juan). This three-year period is the applicable three-year statute of limitations under [Code of Civil Procedure section 338, subdivision \(a\)](#), for enforcing a statutory liability like state-mandated reimbursement. We are affirming this part of the trial court's judgment.

However, the trial court refused to provide, in parallel fashion, declaratory and writ of mandate relief for the CSDR-based audits involving the SDC and EPEPD Programs. The School Districts contend the trial court erred in this respect. We agree.

In refusing to provide this relief, the trial court reasoned that, since the Commission had incorporated the Controller's CSDR into the Commission's regulatory P & G's for the SDC and EPEPD Programs, there was no longer an actual and ongoing controversy upon which to grant declaratory and related mandate relief concerning the CSDR's invalidity as an underground regulation in this context; and the Commission could administratively determine, pursuant to the Incorrect Reduction Claim process, the past audits that had used the CSDR before its incorporation into the SDC and EPEPD Programs' P & G's. This is where we part company with the trial court.

Our departure is based on [section 11350](#) of the APA and the legal principles set forth in [Californians for Native Salmon etc. Assn. v. Department of Forestry](#) (1990) 221 Cal.App.3d 1419, 271 Cal.Rptr. 270 (*Native Salmon*) and its progeny.

[Section 11350](#) of the APA specifies that “[a]ny interested person may obtain a judicial declaration as to the validity of any regulation ... by bringing an action for declaratory relief....” (§ 11350, *subd.* (a).)

In *Native Salmon*, the plaintiffs sought declaratory relief against the state forestry department, alleging that it was department policy, with respect to timber harvest plans: (1) to delay responses to public comments, and (2) to not evaluate the cumulative ****45** impact of logging activities in the plans. The *Native Salmon* court concluded that declaratory relief was appropriate in this context, stating: “[Plaintiffs] ... challenge not a specific [administrative] order or decision [which is generally subject to review only pursuant to a writ of *administrative* mandate, rather than traditional mandate], or even a series thereof, but an overarching, quasi-legislative policy set by an administrative agency. Such a policy is subject to review in an action for declaratory relief.... [¶] ... [R]eview of specific, discretionary administrative decisions [must not be

confused] with review of a generalized agency policy. Declaratory relief directed to *policies* of administrative agencies is not an unwarranted control of discretionary, specific agency decisions.” (*Native Salmon*, *809 *supra*, 221 Cal.App.3d at p. 1429, 271 Cal.Rptr. 270, citations omitted; accord, *Venice Town Council, Inc. v. City of Los Angeles* (1996) 47 Cal.App.4th 1547, 1566, 55 Cal.Rptr.2d 465; see also *Simi Valley Adventist Hospital v. Bontá* (2000) 81 Cal.App.4th 346, 354–355, 96 Cal.Rptr.2d 633.)

[9] [10] [11] Similarly, here, the School Districts have challenged “an overarching, quasi-legislative policy set by an administrative agency” (*Native Salmon*, *supra*, 221 Cal.App.3d at p. 1429, 271 Cal.Rptr. 270) rather than a specific, discretionary administrative decision: i.e., the Controller's policy of using the (underground) CSDR to conduct audits in the SDC and EPEPD Programs for the period straddling the fiscal years 1998 to 2003. Declaratory and accompanying traditional mandate relief is appropriate in this context; this is an ongoing controversy limited by the three-year statute of limitations noted above.⁵

And there is no adequate administrative remedy. The trial court made a finding—supported by substantial evidence—that the Commission “consistently refuses to rule on underground regulation claims on the basis of an opinion that it lacks jurisdiction to decide such claims.” (The trial court made this finding in discussing the Intradistrict Attendance and Collective Bargaining Programs, but the finding applies equally to the SDC and EPEPD Programs.)

We conclude that declaratory and accompanying traditional mandate relief applies not only to the Intradistrict Attendance and Collective Bargaining Programs, but also to the SDC and EPEPD Programs for the fiscal years at issue.⁶

*810 V. Health Fee Elimination Program

[12] In 1986, and again in 1989 (after statutory amendment), the Commission determined **46 that the Health Fee Elimination Program imposed a reimbursable state-mandated cost on those community college districts that provide health services, by requiring those districts to maintain in the future the level of service they had provided in the 1986–1987 fiscal year (termed, the “maintenance of effort” requirement); this “maintenance of effort” had to take place even if the districts, as they were and are permitted to do under the relevant statute, eliminated their nominal statutory student health fee (\$7.50 per semester maximum (former *Ed.Code*, § 72246, Stats.1984, 2d Ex.Sess., ch. 1, p. 6642)); \$10 per semester maximum (current *Ed.Code*, § 76355, subd. (a)(1)).⁷

The College Districts contend that the Controller's Claiming Instruction for the Health Fee Elimination Program is an underground regulation under the APA and beyond the Controller's authority. Specifically, the College Districts argue that the Controller's Health Fee Rule misapplies the Commission's Health Fee Elimination Program P & G's by automatically reducing reimbursement claims by the amount that districts are statutorily authorized to charge students for health fees, even when a district chooses not to charge its students those fees.

Since 1989, the Commission's Health Fee Elimination Program P & G's have stated in pertinent part:

“Any offsetting savings the claimant experiences as a direct result of this statute [i.e., the health fee statutes—formerly *Ed.Code*, § 72246; now *Ed.Code*, § 76355] must be deducted from the [reimbursement] costs claimed. In addition, reimbursement for this mandate received from any source, e.g., federal, state, etc., shall be identified and deducted from this claim. This shall include the amount of \$7.50 per full-time student per semester, \$5.00 per full-time student for summer school, or \$5.00 per full-time student per quarter, as authorized by *Education Code* section 72246[, subdivision] (a). This shall also include payments (fees) received from individuals other than students who are not covered by *Education Code* Section 72246 for health services.”

*811 The Controller's Health Fee Rule (i.e., its Health Fee Elimination Program-specific Claiming Instruction) states in pertinent part:

“Eligible claimants will be reimbursed for health service costs at the level of service provided in the 1986/87 fiscal year. The reimbursement will be reduced by the amount of student health fees authorized per the [Education Code \[section\] 76355](#).”

The College Districts maintain that the Controller's Health Fee Rule constitutes an invalid, underground regulation—i.e., one not adopted pursuant to the APA—because it meets the two-part test of a “regulation”: (1) the Controller generally applies it; and (2) the rule implements, interprets or makes specific the Commission's Health Fee Elimination Program P & G's. **47 (*Morning Star, supra*, 38 Cal.4th at pp. 333–334, 42 Cal.Rptr.3d 47, 132 P.3d 249.)

There is no quibble with part (1)—general application. The real issue is with part (2) of the test—defining a “regulation” as implementing, interpreting, or making specific the Health Fee Elimination Program P & G's. The College Districts argue that those P & G's require that the mandate claimant have actually “experience[d]” or “received” an amount of health service money for that amount to be deducted from the reimbursement claim. That is, if a college district does not charge its students a health service fee, as the district is statutorily permitted to do, then the district has not “experienced” or “received” that fee, and that amount cannot be deducted. The College Districts note that the Health Fee Rule, by contrast, states flatly that “reimbursement will be reduced by the amount of student health fees authorized per the [Education Code \[section\] 76355](#).”

The College Districts' argument carries some weight, especially when viewed solely within the prism of comparing the Health Fee Elimination Program P & G's to the Health Fee Rule semantically. But the argument falters when exposed to the broader context of the nature of state-mandated costs and common sense.

As for the nature of state-mandated costs, [section 17514](#) defines “costs mandated by the state” to mean “any *increased costs* which a local agency or school district is *required to incur* after July 1, 1980, as a result of any statute enacted on or after January 1, 1975, or any executive order implementing any statute enacted on or after January 1, 1975, which mandates a new program or higher level of service of an existing program within the meaning of [Section 6 of Article XIII B of the California Constitution](#).” (Italics added.) And [section 17556](#) reflects this definition by stating that costs are not deemed mandated by the state to the extent the “local agency or school district *has the authority* to levy service charges, fees, or assessments sufficient to pay for the mandated program or increased level of service.” (§ 17556, *subd. (d)*, italics added.)

[13] *812 The College Districts point out, though, in a series of overlapping arguments, that [sections 17514](#) and [17556](#) govern the *Commission's* determination of whether a program is a state-mandated program, not the *Controller's* determination as to audit reductions; and the Commission has already found the Health Fee Elimination Program to be a state-mandated program. This observation, however, does not diminish the basic principle underlying the state mandate process that [sections 17514](#) and [17566](#), subdivision (d) embody: To the extent a local agency or school district “has the authority” to charge for the mandated program or increased level of service, that charge cannot be recovered as a state-mandated cost.⁸ (See *Connell v. Superior Court* (1997) 59 Cal.App.4th 382, 401, 69 Cal.Rptr.2d 231 [“the plain language of [[section 17556, subdivision \(d\)](#)] precludes reimbursement where the local agency has the authority, i.e., the right or the power, to levy fees sufficient to cover the costs of the state-mandated program”]; see *Connell*, at pp. 397–398, 69 Cal.Rptr.2d 231.)

And this basic principle flows from common sense as well. As the Controller succinctly **48 puts it, “Claimants can choose not to require these fees, but not at the state's expense.”

[14] The College Districts also argue that the Controller lacks the authority to rely on these Government Code sections to uphold its Health Fee Rule. The argument is that, since the Health Fee Rule is a claiming instruction, its validity must be determined *solely* through the Commission's P & G's. To accept this argument, though, we would have to ignore, and so would the Controller, the fundamental legal principles underlying state-mandated costs. We conclude the Health Fee Rule is valid.

DISPOSITION

We direct the trial court to issue a peremptory writ of mandate that invalidates the Controller's audits of the School Districts' SDC and EPEPD Program reimbursement claims for the applicable periods identified in footnote 2, *ante*, encompassing the fiscal years 1998 to 2003, to the extent those audits were based on the CSDR and did not become final audit determinations prior to the applicable three-year statute of limitations. If it chooses to do so, the Controller may re-audit the relevant reimbursement claims based on the documentation requirements of the P & G's and claiming *813 instructions when the mandate costs were incurred (i.e., not using the CSDR). In all other respects, the judgment is affirmed.

The parties shall each bear their own costs on appeal. (Cal. Rules of Court, rule 8.278(a)(3).)

We concur: SCOTLAND, P.J., and NICHOLSON, J.

All Citations

188 Cal.App.4th 794, 116 Cal.Rptr.3d 33, 260 Ed. Law Rep. 877, 10 Cal. Daily Op. Serv. 12,281, 2010 Daily Journal D.A.R. 14,831

Footnotes

- 1 Undesignated statutory references are to the Government Code.
- 2 Because of the large number of school districts and program audits involved, as well as the slightly varying fiscal years at issue corresponding to these districts and program audits, we will use the general phrasing “applicable periods roughly encompassing the fiscal years 1998 to 2003” to describe the audits at issue. The parties are well aware of the particular audits being challenged for this period. Regardless, the School Districts must meet the applicable three-year statute of limitations that governs lawsuits based on statutory liability (like state-mandated reimbursement) for any audits of the four programs that have been determined on the basis of the invalidated CSDR. (Code Civ. Proc., § 338; *Union of American Physicians & Dentists v. Kizer* (1990) 223 Cal.App.3d 490, 504, fn. 5, 272 Cal.Rptr. 886.) San Juan School District filed its petition and complaint on March 2, 2007. The rest of the School Districts, together, filed their petition and complaint on May 23, 2006. The trial court consolidated these two petitions and complaints on March 27, 2007.
The School Districts made challenges to other programs as well, but these challenges are not at issue on appeal.
- 3 On May 27, 2004, the Commission validly amended its SDC Program P & G's to adopt this CSDR language.
- 4 As a related aside, it is interesting to note that the Controller's SDC-specific Claiming Instructions that were in place during the pre-2004 P & G's stated that, “[f]or audit purposes, all supporting documents must be retained [by claimant] [only] for a period of two years after the end of the calendar year in which the reimbursement claim was filed or last amended, whichever is later”; but the Controller had three years in which to conduct a reimbursement audit “after the date that the actual reimbursement claim is filed or last amended, whichever is later.” (§ 17558.5, subd. (a).)
- 5 The Controller had requested that, at a minimum, we stay this appeal in light of the Commission's pending decision to incorporate the Controller's CSDR into the Commission's P & G's for the Intradistrict Attendance and Collective Bargaining Programs, as the Commission has done for the SDC and EPEPD Programs. In a subsequent request for judicial notice, the Controller has now noted that the Commission, on January 29, 2010, amended its P & G's for the Intradistrict Attendance and Collective Bargaining Programs to adopt the CSDR for each program. We deny this request for judicial notice. This is because

the central issue in the present appeal concerns the Controller's policy of using the CSDR *during the 1998 to 2003 fiscal years*, when the CSDR was an underground regulation. This issue is not resolved by the Commission's *subsequent* incorporation of the CSDR into its Intradistrict Attendance and Collective Bargaining Programs' P & G's.

Also, we deny the School Districts' request for judicial notice of the Commission's Incorrect Reduction Claim caseload summary and the Controller's list of final audit reports for California school districts and community college districts.

6 In light of our resolution, we need not consider the School Districts' alternative claim that the Controller's CSDR constitutes an unlawful retroactive rule, or the School Districts' additional claim that regardless whether an actual controversy exists for purposes of declaratory relief, the requested writ relief is not moot.

7 As [Education Code section 76355, subdivision \(a\)\(1\)](#) states: "The governing board of a district maintaining a community college may require community college students to pay a fee in the total amount of not more than ten dollars (\$10) for each semester, seven dollars (\$7) for summer school, seven dollars (\$7) for each intersession of at least four weeks, or seven dollars (\$7) for each quarter for health supervision and services, including direct or indirect medical and hospitalization services, or the operation of a student health center or centers, or both." (An inflationary adjustment is provided for in [subdivision \(a\)\(2\) of § 76355.](#))

8 In light of [sections 17514 and 17556, subdivision \(d\)](#), the Commission found the Health Fee Elimination Program to be a reimbursable state-mandated program to the extent the cost to community college districts of maintaining their level of health services at the 1986–1987 level, as required by the Health Fee Elimination Program mandate, is not covered by the nominal health fee authorized by [section 76355, subdivision \(a\)\(1\)](#) (\$10 maximum per semester per student).

ATTACHMENT 32

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 99 - 05

Own Motion Review of the Petition of
Environmental Health Coalition
to Review Waste Discharge Requirements Order No. 96-03,
NPDES Permit No. CAS0108740
for Storm Water and Urban Runoff from the
Orange County Flood Control District
and the
Incorporated Cities of Orange County
Within the San Diego Region,
Issued by the
California Regional Water Quality Control Board,
San Diego Region.

SWRCB/OCC File A-1041

BY THE BOARD:

In Order WQ 98-01, the State Water Resources Control Board (State Water Board) ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Water Quality Control Boards (Regional Water Boards) for Vallejo and Riverside respectively, the United States Environmental Protection Agency (EPA) objected to the permits. The EPA objection was based on the receiving water limitation language. The EPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.

In light of EPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Water Board is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the EPA language. Based on the reasons stated here, and as a precedent decision,¹ the following receiving water limitation language shall be included in future municipal storm water permits.²

RECEIVING WATER LIMITATIONS

The permittees shall comply with Discharge Prohibitions []³ and Receiving Water Limitations [] through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the SWMP and other requirements of this permit including any modifications. The SWMP shall be designed to achieve compliance with Receiving Water Limitations []. If exceedance(s) of water quality objectives or water quality standards (collectively, WQS) persist notwithstanding implementation of the SWMP and other requirements of this permit, the permittees shall assure compliance with Discharge Prohibitions [] and Receiving Water Limitations [] by complying with the following procedure:

¹ In SWRCB Order WR 96-1, the State Water Board determined that water quality orders are precedent decisions. (See Gov. Code §11425.60.)

² This language may be revised as necessary to ensure that terminology conforms with the rest of the permit.

³ Insert appropriate numbers for prohibitions and limitations that implement water quality objectives and water quality standards.

- a. Upon a determination by either the permittees or the Regional Water Board that discharges are causing or contributing to an exceedance of an applicable WQS, the permittees shall promptly notify and thereafter submit a report to the Regional Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of WQSS. The report may be incorporated in the annual update to the SWMP unless the Regional Water Board directs an earlier submittal. The report shall include an implementation schedule. The Regional Water Board may require modifications to the report.
- b. Submit any modifications to the report required by the Regional Water Board within 30 days of notification.
- c. Within 30 days following approval of the report described above by the Regional Water Board, the permittees shall revise the SWMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, implementation schedule, and any additional monitoring required.
- d. Implement the revised SWMP and monitoring program in accordance with the approved schedule.

So long as the permittees have complied with the procedures set forth above and are implementing the revised SWMP, the permittees do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to develop additional BMPs.

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ORDER

IT IS ORDERED that Order WQ 98-01 is revised as discussed above.

CERTIFICATION

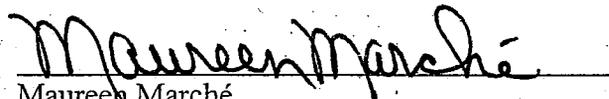
The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on June 17, 1999.

AYE: James M. Stubchaer
Mary Jane Forster
John W. Brown
Arthur G. Baggett, Jr.

NO: None

ABSENT: None

ABSTAIN: None


Maureen Marché
Administrative Assistant to the Board

ATTACHMENT 33

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
ORDER WQ 2009-0008

In the Matter of the Petition of
COUNTY OF LOS ANGELES AND LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
Waste Discharge Requirements Order No. R4-2006-0074
Issued by the
California Regional Water Quality Control Board,
Los Angeles Region

SWRCB/OCC FILE A-1780

BY THE BOARD:

In 2001, the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) adopted Waste Discharge Requirements Order No. 01-182 (the permit), a national pollutant discharge elimination system (NPDES) municipal storm water permit. The permit authorizes storm water discharges from municipalities throughout the County of Los Angeles.¹ In 2002, the Los Angeles Water Board established a total maximum daily load (TMDL) for bacteria at Santa Monica Bay beaches during dry weather (the TMDL). The TMDL includes a waste load allocation for municipal storm water discharges. On September 14, 2006, the Los Angeles Water Board modified the permit by adopting Waste Discharge Requirements Order No. R4-2006-0074 (the Permit modification). The Los Angeles Water Board crafted the Permit modification to implement the summer dry weather waste load allocations in the TMDL.

On October 16, 2006, the County of Los Angeles and the Los Angeles County Flood Control District (Petitioners) filed a petition with the State Water Resources Control Board (State Water Board), challenging the Permit modification. The Petitioners asked that the petition be placed in abeyance. Two years later, in September 2008, the Petitioners activated

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¹ The City of Long Beach is subject to a separate municipal storm water permit. (Los Angeles Water Board Order 99-060 [NPDES No. CAS004002].)

the petition. In this Order, the State Water Board concludes that the Los Angeles Water Board's implementation of the TMDL through the Permit modification was appropriate and proper.²

I. BACKGROUND

A. Regulatory Background

The Petitioners contend the Los Angeles Water Board improperly translated the provisions of an existing TMDL into a municipal storm water permit. In this section, we provide a brief overview of relevant portions of the regulatory frameworks for TMDLs and for storm water regulation.

1. TMDLs

In State Water Board Order WQ 2001-06 (*Tosco*), this Board provided a detailed background of TMDLs. As we explained in the *Tosco* order, water quality standards provide the foundation for identifying impaired waters that require a TMDL. Clean Water Act section 303(c) requires the states to adopt water quality standards that protect the public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act. Water quality standards consist of the beneficial uses of a water body and the criteria to protect those uses. For waters subject to the Clean Water Act, California's water quality standards are typically found in regional water quality control plans (basin plans) and in statewide plans.

Clean Water Act section 303(d) requires states to identify waters of the United States for which technology-based effluent limitations are not stringent enough to implement water quality standards. We refer to those waters that are not attaining water quality standards as impaired waters, and identify the impaired waters on the state's 303(d) list of water quality limited segments.

For the pollutants causing impairment of waters of the United States, Clean Water Act section 303(d) requires states to establish TMDLs. "A TMDL defines the specified maximum amount of a pollutant which can be discharged or 'loaded' into [impaired waters] from all combined sources."³ A TMDL is the sum of the individual wasteload allocations assigned to point sources, load allocations for nonpoint sources, and other elements designed to achieve

² To the extent Petitioners raised issues not discussed in this order, such issues are hereby dismissed as not substantial or appropriate for review by the State Water Board. (See *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177; *Johnson v. State Water Resources Control Board* (2004) 123 Cal.App.4th 1107; Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).)

³ *Dioxin/Organochlorine Center v. Clarke* (9th Cir. 1995) 57 F.3d 1517, 1520.

water quality standards.⁴ Regional water quality control boards typically adopt TMDLs as part of each region's basin plan⁵ and therefore include programs for implementation.⁶ In essence, TMDLs serve as a backstop provision of the Clean Water Act designed to implement water quality standards when other provisions have failed to achieve water quality standards.

TMDLs are not self-executing, but instead, rely upon further orders or actions to adjust pollutant restrictions on individual dischargers.⁷ Federal regulations state that water quality based effluent limitations in NPDES permits must be consistent with the assumptions and requirements of the wasteload allocations in the TMDL, if the TMDL has been approved by the United States Environmental Protection Agency (U.S. EPA).⁸

The State Water Board estimates that statewide over 580 TMDLs will be needed for the current impaired waters list of 2,238 pollutant/water body combinations. Over 115 TMDLs are currently under development.

2. Municipal Storm Water Regulation

This Board has discussed the regulatory requirements for municipal storm water discharges in prior orders.⁹ Section 402(p) of the Clean Water Act prohibits the discharge of pollutants from specified municipal separate storm sewer systems (MS4s) to waters of the United States except as authorized by an NPDES permit. Section 402(p) contains two substantive standards applicable to municipal storm water permits: MS4 permits (1) "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers;"¹⁰ and (2) "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."¹¹

⁴ 40 C.F.R. § 130.3(i).

⁵ See 40 C.F.R. §§ 130.6(c)(1) & 130.7.

⁶ Wat. Code, §§ 13050, subd. (j), & 13242.

⁷ *City of Arcadia v. EPA* (N.D.Cal. 2003) 265 F.Supp.2d 1142, 1144-1145; see also, e.g., State Water Board Resolution 2002-0149, ¶ 9 (approving Santa Monica Beaches Dry Weather Bacteria TMDL and noting that numeric targets and wasteload allocations are not directly enforceable and will need to be translated into individual permit requirements during a subsequent permitting action).

⁸ 40 C.F.R. § 122.44(d)(1)(vii)(B).

⁹ See, e.g., State Water Board Orders WQ 91-03 (*Communities for a Better Environment*), WQ 96-13 (*Save San Francisco Bay Ass'n*), WQ 2000-11 (*Cities of Bellflower et al.*), and WQ 2001-15 (*BIA*).

¹⁰ 33 U.S.C., § 1342(p)(3)(B)(ii).

¹¹ *Id.*, § 1342(p)(3)(B)(iii).

U.S. EPA promulgated regulations establishing minimum requirements for all MS4 permits. The regulations generally focus on requirements that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the maximum extent practicable. The regulations also require the MS4's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer.¹² U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act provision requiring permits to "effectively prohibit non-storm water discharges."¹³ Neither the Clean Water Act nor the federal storm water regulations define "non-storm water." "Illicit discharge" is defined as any discharge to an MS4 "not composed entirely of storm water."¹⁴ Thus, "illicit discharge" is the most nearly applicable definition of "non-storm water" found in federal law and is often used interchangeably with that term.

B. Procedural Background

In 1998, the State Water Board added 44 Santa Monica Bay beaches to its 303(d) list due to bacteria impairments. As required by the Clean Water Act, the Los Angeles Water Board adopted a TMDL entitled *Dry Weather TMDL for Bacteria at Santa Monica Bay Beaches* (the TMDL) on January 24, 2002. The State Water Board approved the TMDL on September 19, 2002. The California Office of Administrative Law and U.S. EPA subsequently approved the TMDL, and the TMDL became effective on July 15, 2003.

The Los Angeles Water Board established the TMDL to protect swimmers and other recreational users of Santa Monica Bay beaches when there are dry weather conditions and the beaches are most heavily used. Dry weather is defined in the TMDL to mean those days with less than 0.1 inches of rain and days at least three days after a day with 0.1 inches of rain or more. The TMDL recognizes that, under certain conditions, even undeveloped watersheds may have exceedances of bacteria water quality standards. As a result, the TMDL differentiates between summer dry weather (April 1 to October 31) and winter dry weather (November 1 to March 31). In summer dry weather, a reference beach in an undeveloped watershed had no exceedances of bacteria water quality standards. The resulting summer dry weather wasteload allocations in the TMDL are, therefore, zero days of exceedance of the bacteria water quality standards at a particular beach. In winter dry weather, the reference

¹² 40 C.F.R. § 122.26(d)(2)(iv)(B).

¹³ National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule (hereafter Phase I preamble), 55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).

¹⁴ 40 C.F.R. § 122.26(b)(2). The definition of "illicit discharge" does provide exceptions for discharges pursuant to a separate NPDES permit and for discharges resulting from fire fighting activities. (*Ibid.*)

beach had three exceedances of the bacteria water quality standards. The resulting winter dry weather wasteload allocations allowed no more than three days of exceedance of the bacteria water quality standards at a particular beach.¹⁵

The TMDL includes wasteload allocations for municipal storm water discharges. Recognizing the different challenges associated with achieving the summer and winter dry weather wasteload allocations, as well as the higher summertime use of the beaches, the Los Angeles Water Board's implementation plan for the TMDL established a shorter schedule for achieving the summer dry weather wasteload allocations. The basin plan amendment establishing the TMDL included an implementation plan with a final compliance date of July 15, 2006 for summer dry weather. The final date for winter dry weather is July 15, 2009. By those dates, the TMDL's implementation plan anticipated there were to be no more discharges from MS4s that cause or contribute to exceedances of bacteria water quality standards on summer dry weather days.

The TMDL applies to Santa Monica Bay beaches along 55 miles of coastline, from Leo Carillo State Beach in the north to Outer Cabrillo beach in the south. Together, the beaches host an average of 55 million visitors per year, who add approximately \$1.7 billion dollars to the local economy.

In May 2006, the Los Angeles Water Board's staff provided notice of its proposal to reopen and modify the permit in order to establish permit requirements consistent with the TMDL and its implementation plan. The proposed modification would make the TMDL's wasteload allocations enforceable, and be consistent with U.S. EPA's regulation requiring that effluent limitations in NPDES permits be consistent with the assumptions and requirements of the wasteload allocations in the TMDL.¹⁶ The Los Angeles Water Board solicited and received two rounds of comments on the proposed permit revisions, held a public workshop to solicit oral and written comments, and issued two sets of responses to comments. During the comment period, the Los Angeles Water Board received many comment letters, including letters of support from Governor Schwarzenegger and other public officials. On September 14, 2006, the Los Angeles Water Board held a public hearing and adopted a permit modification that included requirements to implement the TMDL's summer dry weather wasteload allocations.

¹⁵ Relying on antidegradation principles, the TMDL established winter dry weather wasteload allocations of zero, one, two, or three days of bacteria exceedances based on a particular beach's historical water quality.

¹⁶ 40 C.F.R. §122.44(d)(1)(vii)(B).

The modification prohibits discharges that cause or contribute to exceedances of bacteria water quality standards at Santa Monica Bay beaches on summer dry weather days. The Permit modification added Part 2.5 to the Receiving Water Limitations. Part 2.5 states:

During Summer Dry Weather there shall be no discharges of bacteria from MS4s into the Santa Monica Bay that cause or contribute to exceedances in the Wave Wash, of the applicable bacteria objectives. The applicable bacteria objectives include both the single sample and geometric mean bacteria objectives set to protect the Water Contact Recreation (REC-1) beneficial use, as set forth in the Basin Plan.

The Permit modification also added a discharge prohibition. Discharge Prohibition 1.B states: "Discharges of Summer Dry Weather flows from MS4s into Santa Monica Bay that cause or contribute to exceedances of the bacteria Receiving Water Limitations in Part 2.5 below are prohibited." Neither the discharge prohibition nor the receiving water limitations includes an iterative process towards compliance.

Petitioners submitted a timely joint petition to the State Water Board on October 16, 2006. Pursuant to State Water Board regulations,¹⁷ the petition was held in abeyance for nearly two years before Petitioners activated it on September 18, 2008. On that date, Petitioners also submitted a supplemental statement of points and authorities, which the State Water Board hereby adds to the administrative record. Petitioners, the Los Angeles Water Board, and a group of three environmental organizations sought leave to make additional submissions and to add evidence to the administrative record.¹⁸ Those requests are hereby denied.¹⁹

II. ISSUES AND FINDINGS

Contention: The discharge prohibition and receiving water limitations added by the Permit modification are ambiguous and should be clarified.

Finding: The contested provisions are sufficiently clear and were properly adopted. We conclude that no changes are necessary and reject this contention. Petitioners claim that the discharge prohibition and receiving water limitations added by the Permit modification could be construed to prohibit storm water discharges containing bacteria, despite the Los Angeles Water Board's stated intention to limit those provisions to non-storm

¹⁷ See Cal. Code Regs., tit. 23, § 2050.5, subd. (d).

¹⁸ The filings include Petitioners' request to file a reply pleading, and various requests for administrative notice and to submit additional evidence.

¹⁹ See Cal. Code Regs., tit. 23, §§ 2050.5, subd. (a), & 2050.6.

water discharges. In Petitioners' view, the words "non-storm water" should be added to Part 2.5 of the permit's receiving water limitations to match that intent and to clarify that Part 2.5 does not apply to storm water discharges.

Part 2.5 of the permit reads: "During Summer Dry Weather there shall be no discharges of bacteria from MS4s into the Santa Monica Bay that cause or contribute to [bacteria] exceedances...." The permit defines dry weather as "days with less than 0.1 inch of rainfall and occurring more than three days after a rain day."²⁰ "Summer Dry Weather" is a dry weather day occurring from April 1 to October 31 of each year.²¹

Petitioners' proposed revision to Part 2.5 would read: "During Summer Dry Weather there shall be no *non-storm water* discharges of bacteria from MS4s" (Italics added.) They argue that, without the change, Part 2.5 may apply to "storm water" because that term is defined in federal regulations to include "surface run-off and drainage." Petitioners imply that the federal reference to "surface run-off and drainage" includes run-off and drainage discharges that occur during dry weather periods of the summer.

We decline to accept Petitioners' proposed language, including their similar proposal for Discharge Prohibition 1.B, because the language chosen by the Los Angeles Water Board is clear and appropriate. The challenged permit provisions do not apply to storm water flows. U.S. EPA has previously rejected the notion that "storm water," as defined at 40 Code of Federal Regulations section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges "not in any way related to precipitation events."²² The Los Angeles Water Board's permit language follows U.S. EPA's approach. The new Permit provisions specifically regulate dry weather discharges, which are defined to exclude discharges occurring during or immediately following a reportable precipitation event. Any discharges during such dry weather days would not be precipitation-related. No liability will attach under these provisions for discharges during, or as the result of, a rainfall event exceeding 0.1 inches.

In any event, Petitioners' proposed language deviates from that of the underlying wasteload allocation. That wasteload allocation defines "dry weather" and "summer dry weather" with language identical to that used in the challenged provisions.²³ The discharges

²⁰ Permit, Part 5, Definitions.

²¹ *Ibid.*

²² 55 Fed. Reg. 47990, 47995.

²³ See Basin Plan, Tables 7-4.1, 7-4.2a.

regulated by the wasteload allocation are not qualified by the modifier “non-storm water,” or any other term. Because 40 Code of Federal Regulations section 122.44(d)(1)(vii) requires effluent limitations to be consistent with the assumptions and requirements of the underlying wasteload allocation, we refuse to unnecessarily add language that, if anything, could cause confusion and threaten compliance with U.S. EPA’s regulation.

Contention: The receiving water limitations and discharge prohibition are numeric effluent limitations and, therefore, do not follow the accepted approach for controlling municipal storm water discharges.

Finding: The contested provisions are appropriate and proper. The summer dry weather discharges, as defined by the Permit and the TMDL, are more appropriately regarded as non-storm water discharges, which the Clean Water Act requires to be effectively prohibited.

Petitioners liken the challenged provisions to numeric effluent limitations, and then cite various state and federal sources to argue that using numeric effluent limitations to implement a TMDL in a storm water permit is inappropriate. Petitioners point to State Water Board Order WQ 2001-15 (*BIA*), where we stated that, for municipal storm water permits, “we will generally not require ‘strict compliance’ with water quality standards through numeric effluent limitations,” and instead “we will continue to follow an iterative approach, which seeks compliance over time” with water quality standards.²⁴ They also point to a U.S. EPA guidance document entitled *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs* (the U.S. EPA guidance document).²⁵ Petitioners cite a provision therein that reads, “because storm water discharges are due to storm events that are highly variable in frequency and duration and are not easily characterized, only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction discharges.”²⁶

The references relied upon by Petitioners are inapposite, and do not support invalidating the Los Angeles Water Board’s requirements. Instead, the Petitioners’ references are directed at the regulation of storm water discharges. The Permit modification is limited to non-storm water discharges which occur during summer dry weather. The U.S. EPA guidance document is limited to wasteload allocations “for storm water discharges” and permit limitations

²⁴ *BIA*, *supra*, at p. 8.

²⁵ U.S. EPA, *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*, Memorandum from U.S. EPA Director, Office of Wetlands, Oceans and Watersheds Robert H. Wayland, III and Director, Office of Wastewater Management James Hanlon to Water Division Directors, Regions 1-10, Nov. 22, 2002 (hereafter U.S. EPA guidance document).

²⁶ *Id.*, at p. 4.

and conditions “based on the [wasteload allocations] for storm water discharges.”²⁷

Furthermore, the Clean Water Act and the federal storm water regulations assign different performance requirements for storm water and non-storm water discharges. These distinctions in the guidance document, the Clean Water Act, and the storm water regulations make it clear that a regulatory approach for storm water - such as the iterative approach we have previously endorsed - is not necessarily appropriate for non-storm water.

We instead look to directly relevant authorities. Federal law requires municipal storm water permit limitations to be consistent with applicable wasteload allocations.²⁸ The Clean Water Act requires MS4 permit requirements to effectively prohibit non-storm water discharges.²⁹ Similarly, California law requires NPDES permits to apply “any more stringent effluent standards or limitations necessary to implement water quality control plans....”³⁰

The basin plan established a compliance deadline of July 15, 2006, for achieving final compliance with the summer dry weather wasteload allocations for bacteria. The TMDL, which is a component of the Los Angeles Water Board’s basin plan, assigns a wasteload allocation to certain “local agencies that are permittees or co-permittees on a municipal storm water permit.”³¹ The basin plan further establishes that these agencies are responsible for complying with the summer dry weather wasteload allocation. The summer dry weather wasteload allocation prohibits the exceedance of bacteria water quality objectives on summer dry weather days at specified locations.³² The Permit modification is consistent with the wasteload allocation and other basin plan provisions.

The Permit modification is also consistent with the federal framework for non-storm water discharges. 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B), which implements the Clean Water Act’s requirement for the effective prohibition of non-storm water discharges, requires municipal storm water permittees to detect and remove all categories of non-storm water discharges to the MS4, or to require the non-storm water discharger to obtain a separate NPDES permit. While MS4 permits generally contain exceptions for some non-storm water discharges, these exceptions do not extend to non-storm water discharges identified as a

²⁷ U.S. EPA guidance document, *supra*, at p. 1.

²⁸ 40 C.F.R. § 122.44(d)(1)(vii)(B).

²⁹ 33 U.S.C. § 1342(p)(3)(B)(ii).

³⁰ Wat. Code, § 13377.

³¹ Basin Plan, Table 7-4.1, fn. 3.

³² *Id.*, Table 7-4.1.

source of pollutants.³³ In adopting the TMDL, the Los Angeles Water Board identified summer dry weather discharges as a source of water quality exceedances for bacteria. Prohibiting summer dry weather bacteria exceedances caused or contributed to by MS4s is therefore consistent with the federal framework for non-storm water discharges.

Moreover, the references Petitioners' rely upon to challenge the prohibitions and receiving water limitations as strict, numeric effluent limitations are not relevant to this petition. The contested provisions are receiving water limitations, not numeric effluent limitations. The contested provisions do not impose a numeric limitation measured at a point source outfall. Instead, compliance with the limitations is measured in the receiving water, and more specifically, at the "wave wash" for the individual beaches. The TMDL defines the wave wash "as the point at which the storm drain or creek empties and the effluent from the storm drain initially mixes with the receiving ocean water."³⁴ The provisions are directed at the quality of the receiving water, as affected by the discharge. They do not establish numeric effluent limitations for the discharge to the receiving water.^{35, 36}

While the issue before us only concerns permit requirements to implement summer dry weather wasteload allocations and therefore non-storm water discharges, the result would not necessarily be different for municipal *storm water* discharges subject to a TMDL. TMDLs, which take significant resources to develop and finalize, are devised with specific implementation plans and compliance dates designed to bring impaired waters into compliance with water quality standards. It is our intent that federally mandated TMDLs be given substantive effect. Doing so can improve the efficacy of California's NPDES storm water permits. This is not to say that a wasteload allocation will result in numeric effluent limitations for municipal storm water discharges. But, when an approved TMDL is in place, the water boards will give substantive effect to the TMDL and allow it to become much more than an academic exercise. Whether a future municipal storm water permit requirement appropriately implements a storm water wasteload allocation will need to be decided based on the regional

³³ See 40 C.F.R. § 122.26(d)(2)(iv)(B)(1). The exempted categories include, but are not limited to, water line flushing, rising ground waters, landscape irrigation, and street wash water.

³⁴ Basin Plan, Table 7-4.1, fn. 1.

³⁵ See, e.g., *BIA, supra*; State Water Board Order WQ 99-05 (*Environmental Health Coalition*). Those Orders endorsed receiving water limitations modified by an iterative process. The absence of an accompanying iterative process does not convert receiving water limitations into numeric effluent limitations.

³⁶ For the purposes of state enforcement under the Porter-Cologne Act's mandatory minimum penalties law, California distinguishes numeric restrictions on discharged effluent from receiving water limitations. (Wat. Code, § 13385.1, subd. (c).)

water quality control board's findings supporting either the numeric or non-numeric effluent limitations contained in the permit.

III. ORDER

IT IS HEREBY ORDERED THAT the petition of the County of Los Angeles and Los Angeles County Flood Control District is denied.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on August 4, 2009.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

ATTACHMENT 34

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
ORDER WQ 2015-0075

In the Matter of Review of

Order No. R4-2012-0175, NPDES Permit No. CAS004001

**WASTE DISCHARGE REQUIREMENTS FOR MUNICIPAL SEPARATE STORM SEWER
SYSTEM (MS4) DISCHARGES WITHIN THE COASTAL WATERSHEDS OF
LOS ANGELES COUNTY, EXCEPT THOSE DISCHARGES ORIGINATING FROM THE
CITY OF LONG BEACH MS4**

Issued by the
California Regional Water Quality Control Board,
Los Angeles Region

SWRCB/OCC FILES A-2236 (a)-(kk)

BY THE BOARD:

In this order, the State Water Resources Control Board (State Water Board) reviews [Order No. R4-2012-0175](#) (NPDES Permit No. CAS004001) adopted by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) on November 8, 2012. Order No. R4-2012-0175 regulates discharges of storm water and non-storm water from the municipal separate storm sewer systems (MS4s) located within the coastal watersheds of Los Angeles County, with the exception of the City of Long Beach MS4, and is hereinafter referred to as the “Los Angeles MS4 Order” or the “Order.” We received 37 petitions challenging various provisions of the Los Angeles MS4 Order. For the reasons discussed herein, we generally uphold the Los Angeles MS4 Order, but with a number of revisions to the findings and provisions in response to issues raised in the petitions and as a result of our own review of the Order.

I. BACKGROUND

The Los Angeles MS4 Order regulates discharges from the MS4s operated by the Los Angeles County Flood Control District, Los Angeles County, and 84 municipal permittees (Permittees) in a drainage area that encompasses more than 3,000 square miles and multiple watersheds. The Order was issued by the Los Angeles Water Board in

accordance with section 402(p)(3)(B) of the Clean Water Act¹ and sections 13263 and 13377 of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act),² as a National Pollutant Discharge Elimination System (NPDES) permit to control storm water and non-storm water discharges that enter the area's water bodies from the storm sewer systems owned or operated by the multiple governmental entities named in the Order. The Los Angeles MS4 Order superseded Los Angeles Water Board [Order No. 01-182](#) (2001 Los Angeles MS4 Order), and is the fourth iteration of the NPDES permit for MS4 discharges in the relevant area.

The Los Angeles MS4 Order incorporates most of the pre-existing requirements of the 2001 Los Angeles MS4 Order, including the water quality-based requirement to not cause or contribute to exceedances of water quality standards in the receiving water. The Los Angeles MS4 Order also requires Permittees to comply with new water quality-based requirements to implement 33 watershed-based total maximum daily loads (TMDLs) for the region. The Order links both of these water quality-based requirements to the programmatic elements of the Order by allowing Permittees to comply with the water quality-based requirements, in part, by developing and implementing a watershed management program (WMP) or enhanced watershed management program (EWMP), as more specifically defined in the Order.

Following adoption of the Los Angeles MS4 Order, we received 37 timely petitions challenging various provisions of the Order and, in particular, the provisions implementing TMDLs and integrating water quality-based requirements and watershed-based program implementation. Several petitioners asked that their petitions be held in abeyance;³ however, due to the number of active petitions also seeking review, we declined to hold those petitions in abeyance at that time.⁴ Five petitioners additionally requested that we partially stay the Los Angeles MS4 Order. Following review, the Executive Director of the State Water Board denied the stay requests for failure to comply with the prerequisites for a stay as specified in California Code of Regulations, title 23, section 2053.

¹ 33 U.S.C. § 1342(p)(3)(B).

² Wat. Code, §§ 13263, 13377.

³ See Cal. Code Regs., tit. 23, § 2050.5, subd. (d).

⁴ By letter dated January 30, 2013, we provided an opportunity for petitioners to submit an explanation for why a petition should be held in abeyance notwithstanding the existence of the active petitions. In response, two petitioners, City of Signal Hill and the City of Claremont, argued that their petitions raised unique issues not common to the remaining petitions and therefore appropriate for abeyance. We thereafter denied their requests on July 29, 2013, finding that the unique issues could nevertheless be resolved concurrently with the issues in the other petitions. On October 9, 2013, the City of Claremont withdrew two of the claims in its petition.

We deemed the petitions complete by letter dated July 8, 2013, and, as permitted under our regulations,⁵ consolidated the petitions for review.

An issue front and center in the petitions is the appropriateness of the approach of the Los Angeles MS4 Order in addressing what we generally refer to as “receiving water limitations.” Receiving water limitations in MS4 permits are requirements that specify that storm water and non-storm water discharges must not cause or contribute to exceedances of water quality standards in the waters of the United States that receive those discharges. In precedential State Water Board [Order WQ 99-05](#) (*Environmental Health Coalition*), we directed that all MS4 permits contain specific language that explains how the receiving water limitations will be implemented. (For clarity, we refer to MS4 permit language that relates to implementation of the permit’s receiving water limitations as “receiving water limitations provisions.”) We held a workshop on November 20, 2012, concerning receiving water limitations in MS4 permits. The purpose of the workshop was to receive public comment on an issue paper discussing several alternatives to the receiving water limitations provisions currently included in MS4 permits as directed by Order WQ 99-05 (Receiving Water Limitations Issue Paper).⁶

Because the Los Angeles MS4 Order contains new provisions that authorize the Permittees to develop and implement WMP/EWMPs in lieu of requiring compliance with the receiving water limitations provisions, we view our review of the Order as an appropriate avenue for resolving some of the issues raised in our November 20, 2012 workshop. Through notice to all interested persons, we bifurcated the responses to the petitions and solicited two separate sets of responses: (1) Responses to address issues related to whether the WMP/EWMP alternatives contained in the Los Angeles MS4 Order are an appropriate approach to revising the receiving water limitations provisions in MS4 permits (August 15, 2013 Receiving Water Limitations Submissions); and (2) Responses to address all other issues raised in the petitions (October 15, 2013 Responses).⁷ We held a workshop on October 8, 2013, to hear public comment on the first set of responses.

⁵ Cal. Code Regs., tit. 23, § 2054.

⁶ Information on that workshop is available at http://www.waterboards.ca.gov/water_issues/programs/stormwater/rwl.shtml (as of Nov 18, 2014).

⁷ We requested the bifurcated responses initially by letter dated July 15, 2013. Subsequent letters on July 29, 2013, and September 18, 2013, clarified the nature of the submissions and extended the submission deadline for the second response.

State Water Board regulations generally require final disposition on petitions within 270 days of the date a petition is deemed complete.⁸ However, in this case, we required additional time to review the large number of issues raised in the petitions. When the State Water Board anticipates addressing a petition on the merits after the review period passes, it may indicate that it will review the matter on its own motion.⁹ On April 1, 2014, we adopted [Order WQ 2014-0056](#) taking up review of the issues in the petitions on our own motion.¹⁰

We now resolve the issues in the petitions with this order.

II. ISSUES AND FINDINGS

The 37 petitions raise over sixty contentions claiming deficiencies in the Los Angeles MS4 Order. This Order addresses the most significant contentions. To the extent petitioners raised issues that are not discussed in this Order, such issues are dismissed as not raising substantial issues appropriate for State Water Board review.¹¹

Before proceeding to the merits of the petitions, we will resolve several procedural issues.

Requests to Take Official Notice or Supplement the Record with Additional Evidence

We received a number of requests to take official notice of documents not in the administrative record of the adoption of the Los Angeles MS4 Order by the Los Angeles Water Board (hereinafter Administrative Record)¹² and a number of requests to admit supplemental evidence not considered by the Los Angeles Water Board.¹³ We reviewed the requests with

⁸ Cal. Code Regs., tit. 23, § 2050.5, subd. (b).

⁹ See Wat. Code, § 13320, subd. (a); Cal. Code Regs., tit. 23, § 2050.5, subd. (c).

¹⁰ To avoid premature litigation on the petition issues as a result of our review extending past the 270 day-regulatory review period, at our suggestion most of the petitioners asked that their petitions be placed in abeyance until adoption by the State Water Board of a final order. We granted those requests. Simultaneously with adopting this order, we are removing the petitions from abeyance and acting upon them.

¹¹ *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177; *Johnson v. State Water Resources Control Bd.* (2004) 123 Cal.App.4th 1107, 1114; Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).

¹² The Administrative Record was prepared by the Los Angeles Water Board and is available at <http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/AdminRecordOrderNoR4_2012_0175/index.shtml> (as of Nov. 18, 2014).

¹³ Several requests for official notice or to admit supplemental evidence were received concurrently with submission of the petitions, with the August 15, 2013 Receiving Water Limitations Submissions, and with the October 15, 2013 Responses. Additional requests for official notice were submitted concurrently with comments on first and revised public drafts of this order and were opposed by several parties. (Request for Official Notice, Natural Resources Defense Council, Los Angeles Waterkeeper, and Heal the Bay, Jan. 21, 2015; Request for Official Notice, Natural Resources Defense Council, Los Angeles Waterkeeper and Heal the Bay, June 2, 2015.) Although we have reviewed these additional requests for official notice, we have not granted the requests for the various reasons articulated in this section, in Section II.B.8, and in footnote 74.

consideration of whether they were appropriate for notice or admission based on the legal standards governing our proceedings¹⁴ and whether the documents would materially aid in our review of the issues in the proceedings. We grant the requests with regard to documents 1-7 below, and additionally take official notice on our own motion of documents 8, 9, and 10.¹⁵

1. [Order No. 2013-0001-DWQ](#), NPDES Permit for Storm Water Discharges from Small MS4s, adopted by State Water Board, February 5, 2013;¹⁶
2. Modified NPDES Permit No. DC0000022 for the MS4 for the District of Columbia issued by the United States Environmental Protection Agency (USEPA), November 9, 2012, and a responsiveness summary issued in support of its original adoption of the permit, October 7, 2011;¹⁷
3. Administrative Procedures Update Number 90-004 on Antidegradation Policy Implementation for NPDES Permitting, issued by the State Water Board, July 2, 1990;¹⁸
4. Chapter 7 of the NPDES Permit Writers' Manual, updated by USEPA, September 2010;¹⁹
5. Letter to the Water Management Administration, Maryland Department of the Environment, issued by USEPA, August 8, 2012;²⁰

¹⁴ For official notice see Cal. Code Regs., tit. 23, § 648.2; Gov. Code, § 11515; Evid. Code, § 452. For admission of supplemental evidence see Cal. Code Regs., tit. 23, § 2050.6.

¹⁵ We note that two documents for which we received requests for official notice are already in the administrative record: USEPA, Memorandum Setting Forth Revisions to the November 22, 2002 Memorandum Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs (Nov. 12, 2010) (Administrative Record, section 10.II, RB-AR23962-23968); USEPA, Chapter 6 of the NPDES Permit Writers' Manual (updated Sept. 2010) (Administrative Record, section 10.IV, RB-AR24905-24932).

¹⁶ County of Los Angeles October 15, 2013 Response, Att. C; also available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/phsii2012_5th/order_final.pdf> (as of Nov. 18, 2014).

¹⁷ Los Angeles Water Board Request for State Water Board to Take Official Notice of Or Accept as Supplemental Evidence Exhibit A through SS (Oct. 15, 2013) (Los Angeles Water Board Request for Official Notice), Exh.'s A, B; also available at <http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/MS4FinalLimitedModDocument/FinalModifiedPermit_10-25-12.pdf> and <http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/FinalPermit2011/DCMS4FINALResponsivenessSummary093011.pdf> (as of Nov. 18, 2014).

¹⁸ Los Angeles Water Board Request for Official Notice, Exh.C; also available at <http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/apu_90_004.pdf> (as of Nov. 18, 2014).

¹⁹ Chapter 7 of USEPA's NPDES Permit Writers' Manual, EPA-833-K-10-001, September 2010 (NPDES Permit Writers' Manual) was submitted as Exhibit C to Natural Resources Defense Council, Los Angeles Waterkeeper and Heal the Bay Request for Official Notice (Dec. 10, 2012) (Environmental Petitioners' Request for Official Notice). The chapter may additionally be accessed through links at <<http://water.epa.gov/polwaste/npdes/basics/NPDES-Permit-Writers-Manual.cfm>> (as of Nov. 18, 2014).

6. Memorandum to the Water Management Division Directors, Regions I-X, and NPDES State Directors, issued by USEPA, 1989;²¹
7. “Guidance on Implementing the Antidegradation Provisions of 40 C.F.R. 131.12,” issued by USEPA, Region 9, June 3, 1987;²²
8. [Order WQ 2014-0077-DWQ](#), amending NPDES Statewide Storm Water Permit for State of California Department of Transportation, [Order 2012-0011-DWQ](#), adopted by State Water Board, May 20, 2014;²³
9. Statement from USEPA soliciting comments on the USEPA Memorandum Setting forth Revisions to the November 22, 2002 Memorandum Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs (November 12, 2010), issued March 17, 2011.²⁴
10. Memorandum, “Revisions to the November 22, 2002 Memorandum ‘Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,’” issued by USEPA, November 26, 2014.²⁵

In addition, we are incorporating the administrative record of the November 20, 2012 workshop on receiving water limitations, including the Receiving Water Limitations Issue Paper and comments by interested persons, into our record for the petitions on the Los Angeles MS4 Order.²⁶

(continued from previous page)

²⁰ Environmental Petitioners’ Request for Official Notice, Exh.B, available at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236m_rfon.pdf> (as of Nov. 18, 2014).

²¹ Environmental Petitioners’ Request for Official Notice, Exh.D; also available at <<http://www.epa.gov/npdes/pubs/owm0231.pdf>> (as of Nov. 18, 2014).

²² Environmental Petitioners’ Request for Official Notice, Exh.E; available at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236m_rfon.pdf> (as of Nov. 18, 2014).

²³ Available at <http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0077_dwq.pdf> (as of Nov. 18, 2014).

²⁴ Available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_tmdlwla_comments.pdf> (as of Nov. 18, 2014).

²⁵ Available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/EPA_SW_TMDL_Memo.pdf> (as of March 30, 2015).

²⁶ The Receiving Water Limitations Issue Paper and comments and workshop presentations by interested person are available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/rwl.shtml>.

Among other requests, we are not granting the requests to take official notice of or supplement the Administrative Record with the notices of intent, workplans, draft programs, and other documents filed by Permittees toward development of WMPs/EWMPs and associated monitoring programs following adoption of the Los Angeles MS4 Order or comments submitted on those documents, or the conditional approvals of several of the programs. With regard to factual evidence regarding actions taken by Permittees to comply with the Los Angeles MS4 Order after it was adopted, we believe it appropriate to close the record with the adoption of the Los Angeles MS4 Order. However, we are keenly aware that the success of the Los Angeles MS4 Order in addressing water quality issues depends primarily on the careful and effective development and implementation of programs consistent with the requirements of the Order; we speak to that issue later in our discussion.

City of El Monte's Amended Petition

Petitioner City of El Monte (El Monte) timely filed a petition on December 10, 2012, challenging a number of provisions of the Los Angeles MS4 Order. Thereafter, on February 19, 2013, El Monte filed an amended petition, based on information it asserted was not available prior to the deadline for submission of the petition.

Water Code section 13320, subdivision (a) provides that a petition for review of a regional water quality control board (regional water board) action must be filed within 30 days of the regional water board's action.²⁷ The State Water Board interprets that requirement strictly and petitions filed more than 30 days from regional water board action are rejected as untimely. El Monte asserted that the two additional arguments raised in the amended petition were based on information that was not available prior to the deadline for submitting the petition and were therefore appropriate for State Water Board consideration.

Even if we were required by statute or regulation to accept amended petitions based on new information, here, El Monte's new arguments are not supported by information previously unavailable. First, El Monte argues that the Supreme Court's decision in *Los Angeles County Flood Control District v. Natural Resources Defense Council* (2013) 133 S.Ct. 710 invalidated certain provisions of the Los Angeles MS4 Order that require compliance with water quality standards and total maximum daily load requirements through receiving water monitoring. Contrary to El Monte's assertion, the decision by the Supreme Court did not invalidate any requirements of the Los Angeles MS4 Order and did not result in any changes to

²⁷ See also Cal. Code Regs., tit. 23, § 2050.

the Order. The Supreme Court decision, to the extent it applies to the legal issues before us in this matter, constitutes precedential case law and must be considered in our review of the Los Angeles MS4 Order, but it does not constitute new information that supports an amended petition.²⁸

Second, El Monte argues that the Los Angeles Water Board failed to consider various provisions of the California Watershed Improvement Act of 2009²⁹ when it adopted the Los Angeles MS4 Order. To the extent El Monte believed that the California Watershed Improvement Act was relevant to adoption of the Los Angeles MS4 Order, El Monte had the opportunity to raise that issue in comments before the Los Angeles Water Board and in its timely petition to the State Water Board. Having failed to raise the issue before the Los Angeles Water Board and in its timely petition, El Monte cannot raise the issue in an amended petition.³⁰

We reject El Monte's amended petition as untimely.

Environmental Petitioners' Motion to Strike

Petitioners Natural Resources Defense Council, Los Angeles Waterkeeper, and Heal the Bay (Environmental Petitioners), submitted a motion on November 11, 2013, requesting that the State Water Board strike sections of the October 15, 2013 Responses by six petitioners (Motion to Strike). The relevant sections respond to a collateral estoppel argument made by the Environmental Petitioners in their August 15, 2013 Receiving Water Limitations Submission to the State Water Board. Several parties asserted in their petitions that requiring compliance with water quality standards in MS4 permits violates federal law or conflicts with prior State Water Board precedent. The Environmental Petitioners responded in their August 15, 2013 Receiving Water Limitations Submission that these arguments were barred by collateral estoppel because the claims were settled in prior court cases challenging the 2001 Los Angeles MS4 Order. Six of the October 15, 2013 Responses, namely those by the Cities of

²⁸ We note that the State Water Board has the option of allowing additional briefing when there are material legal developments concerning issues raised in a petition, but we did not find such briefing would aid review of the petitions in this case.

²⁹ Wat. Code, § 16100 et seq.

³⁰ In addition to being untimely, El Monte's argument lacks merit. The California Watershed Improvement Act of 2009 grants authority to local government permittees regulated by an MS4 permit to develop and implement watershed improvement plans, but does not limit the authority of a regional water board to impose terms related to watershed management in an MS4 permit. Further, the terms of the WMPs/EWMPs are largely consistent with the watershed improvement plans authorized by the Act, so a permittee can comply with the Los Angeles MS4 Order while also using the authority provided by the California Watershed Improvement Act of 2009 if it so chooses.

Arcadia, Claremont, Covina, Duarte and Huntington Park, San Marino et al.,³¹ and Sierra Madre, incorporated a response to the collateral estoppel argument.

We stated in a July 15, 2013 letter that “[i]nterested persons may not use the [October 15]³² deadline for responses on the remaining petition issues as an opportunity to respond to comments filed on the receiving water limitations approach.” We clarified further in a July 29, 2013 letter: “[W]hen submitting subsequent responses to the petitions in accordance with the [October 15] deadline, petitioners and interested persons should not raise new issues related to the specific questions regarding the watershed management program/enhanced watershed management program or respond to any August 15, 2013, submissions; however petitioners and interested persons will not be precluded from responding to specific issues raised in the original petitions on grounds that the issues are related to the receiving water limitations language.”

We find that the collateral estoppel responses by the six petitioners are disallowed by the direction we provided in our July 15 and July 29, 2013 letters. However, as will be apparent in our discussion in section II.A, we do not rely on the Environmental Petitioners’ collateral estoppel argument in resolving the petitions. Our determination that portions of the October 15, 2013 Responses are disallowed is, therefore, immaterial to the resolution of the issues.³³

Having resolved the procedural issues, we turn to the merits of the Petitions.

A. Implementation of the Iterative Process as Compliance with Receiving Water Limitations

The Los Angeles MS4 Order includes receiving water limitations provisions that are consistent with our direction in Order WQ 99-05 in Part V.A of the Los Angeles MS4 Order. Part V.A. provides, in part, as follows:

1. Discharges from the MS4 that cause or contribute to the violation of receiving water limitations are prohibited.

³¹ The cities of San Marino, Rancho Palos Verdes, South El Monte, Norwalk, Artesia, Torrance, Beverly Hills, Hidden Hills, Westlake Village, La Mirada, Vernon, Monrovia, Agoura Hills, Commerce, Downey, Inglewood, Culver City, and Redondo Beach submitted a joint October 15, 2013 Response.

³² The July 15, 2013 letter set a deadline of September 20, 2013, which was subsequently extended to October 15, 2013.

³³ In a November 21, 2013 letter, we indicated that we would consider the Motion to Strike concurrently with drafting of this Order, but that we would not accept any additional submissions in this matter, including any responses to the Motion to Strike. City of San Marino objected to the letter and submitted an opposition to the Motion to Strike. Several petitioners submitted joinders in City of San Marino’s motion. For the same reasons articulated above, we are not accepting these submissions; they would not affect our resolution of the issues.

2. Discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible [footnote omitted], shall not cause or contribute to a condition of nuisance.
3. The Permittees shall comply with Parts V.A.1 and V.A.2 through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the storm water management program and its components and other requirements of this Order including any modifications. . . .³⁴

The petitioners that are permittees (hereinafter referred to as “Permittee Petitioners”)³⁵ argue that the above language either means, or should be read and/or clarified to mean, that good faith engagement in the requirements of Part V.A.3, traditionally referred to as the “iterative process,” constitutes compliance with Parts V.A.1. and V.A.2. The position put forth by Permittee Petitioners is one we took up when we initiated a process to re-examine the receiving water limitations and iterative process in MS4 permits statewide with our Receiving Water Limitations Issue Paper and the November 20, 2012 workshop. We summarize the law and policy regarding Permittee Petitioners’ position again here and ultimately disagree with Permittee Petitioners that implementation of the iterative process does or should constitute compliance with receiving water limitations.

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards.³⁶ In the context of NPDES permits for MS4s, however, the Clean Water Act does not explicitly reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of prohibiting non-storm water discharges and reducing pollutants in the discharge to the Maximum Extent Practicable (MEP) in all cases, but requiring strict compliance with water quality standards (e.g., by imposing numeric effluent limitations) is at the discretion of the permitting agency.³⁷ Specifically the Clean Water Act states as follows:

Permits for discharges from municipal storm sewers –

. . .

(ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

³⁴ Los Angeles MS4 Order, Part V.A, pp. 38-39.

³⁵ For ease of reference, where an argument is made by multiple Permittee Petitioners, even if not by all, we attribute that argument to Permittee Petitioners generally, and do not list which of the 37 Permittee Petitioners in fact make the argument. Where only one or two Permittee Petitioners make a particular argument, we have identified the specific Permittee Petitioner(s).

³⁶ 33 U.S.C. §§ 1311, 1342(a).

³⁷ 33 U.S.C. § 1342(p)(3)(B); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as . . . the State determines appropriate for the control of such pollutants.³⁸

Thus, a permitting agency imposes requirements related to attainment of water quality standards where it determines that those provisions are “appropriate for the control of [relevant] pollutants” pursuant to the Clean Water Act municipal storm water provisions.

Under the Porter-Cologne Act, waste discharge requirements must implement applicable water quality control plans, which include the beneficial uses to be protected for a given water body and the water quality objectives reasonably required for that protection.³⁹ In this respect, the Porter-Cologne Act treats MS4 dischargers and other dischargers even-handedly and anticipates that all waste discharge requirements will implement the water quality control plans. However, when implementing requirements under the Porter-Cologne Act that are not compelled by federal law, the State Water Board and regional water boards (collectively, “water boards”) have some flexibility to consider other factors, such as economics, when establishing the appropriate requirements.⁴⁰ Accordingly, since the State Water Board has discretion under federal law to determine whether to require strict compliance with the water quality standards of the water quality control plans for MS4 discharges, the State Water Board may also utilize the flexibility under the Porter-Cologne Act to decline to require strict compliance with water quality standards for MS4 discharges.

We have previously exercised the discretion we have under federal law in favor of requiring compliance with water quality standards, but have required less than strict compliance. We have directed, in precedential orders, that MS4 permits require discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters,⁴¹ but have prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements. That iterative process involves reporting of the violation, submission of a report describing proposed improvements to BMPs

³⁸ 33 U.S.C. § 1342(p)(3)(B).

³⁹ Wat. Code, § 13263. The term “water quality standards” encompasses the beneficial uses of the water body and the water quality objectives (or “water quality criteria” under federal terminology) that must be met in the waters of the United States to protect beneficial uses. Water quality standards also include the federal and state antidegradation policy.

⁴⁰ Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

⁴¹ State Water Board Orders WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego*).

expected to better meet water quality standards, and implementation of these new BMPs.⁴² The current language of the existing receiving waters limitations provisions was actually developed by USEPA when it vetoed two regional water board MS4 permits that utilized a prior version of the State Water Board's receiving water limitations provisions.⁴³ In State Water Board Order WQ 99-05, we directed that all regional boards use USEPA's receiving water limitations provisions.

There has been significant confusion within the regulated MS4 community regarding the relationship between the receiving water limitations and the iterative process, in part because the water boards have commonly directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process. But the iterative process, as established in our precedential orders and as generally written into MS4 permits adopted by the water boards, does not provide a "safe harbor" to MS4 dischargers. When a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the permit's receiving water limitations and potentially subject to enforcement by the water boards or through a citizen suit, regardless of whether or not the discharger is actively engaged in the iterative process.⁴⁴

The position that the receiving water limitations are independent from the provisions that establish the iterative process has been judicially upheld on several occasions. The receiving water limitations provisions of the 2001 Los Angeles MS4 Order specifically have been litigated twice, and in both cases, the courts upheld the provisions and the Los Angeles Water Board's interpretation of the provisions. In a decision resolving a challenge to the 2001 Los Angeles MS4 Order, the Los Angeles County Superior Court stated: "[T]he Regional [Water] Board acted within its authority when it included [water quality standards compliance] in

⁴² State Water Board Order WQ 99-05, pp. 2-3; see also State Water Board Order WQ 2001-15, pp. 7-9. Additionally, consistent with federal law, we found it appropriate to require implementation of BMPs in lieu of numeric water quality-based effluent limitations to meet water quality standards. See State Water Board Orders WQ 91-03 (*Citizens for a Better Environment*), WQ 91-04 (*Natural Resources Defense Council*), WQ 98-01, WQ 2001-15. This issue is discussed in greater detail in Section II.C. of this order.

⁴³ See State Water Board Orders WQ 99-05, WQ 2001-15.

⁴⁴ Several Permittee Petitioners have argued that the State Water Board's opinion in State Water Board Order WQ 2001-15 must be read to endorse a safe harbor in the iterative process. We disagree. Regardless, the State Water Board's position that the iterative process of the subject permit did not create a "safe harbor" from compliance with receiving water limitations was clearly established in subsequent litigation on that order. (See *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (Super. Ct. 2003, No. GIC780263), *affd.* *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866.)

the Permit without a ‘safe harbor,’ whether or not compliance therewith requires efforts that exceed the ‘MEP’ standard.”⁴⁵ The lack of a safe harbor in the iterative process of the 2001 Los Angeles MS4 Order was again acknowledged in 2011 and 2013, this time by the Ninth Circuit Court of Appeal. In these instances, the Ninth Circuit was considering a citizen suit brought by the Natural Resources Defense Council against the County of Los Angeles and the Los Angeles County Flood Control District for alleged violations of the receiving water limitations of that order. The Ninth Circuit held that, as the receiving water limitations of the 2001 Los Angeles MS4 Order (and accordingly as the precedential language in State Water Board Order WQ 99-05) was drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.⁴⁶ The California Court of Appeal has come to the same conclusion in interpreting similar receiving water limitations provisions in MS4 Orders issued by the San Diego Regional Water Quality Control Board in 2001 and the Santa Ana Regional Water Quality Control Board in 2002.⁴⁷

While we reiterate that the judicial rulings have been consistent with the water boards’ intention and position regarding the relationship between the receiving water limitations and the iterative process, we acknowledge that some in the regulated community perceived the 2011 Ninth Circuit opinion in particular as a re-interpretation of that relationship. Our Receiving Water Limitations Issue Paper and subsequent workshop reflected our desire to re-examine the issue in response to concerns expressed by the regulated community in the aftermath of that ruling.

As stated above, both the Clean Water Act and the Porter-Cologne Act afford some discretion to not require strict compliance with water quality standards for MS4 discharges. In each of the discussed court cases above, the court’s decision is based on the specific permit language; thus the cases do not address our authority with regard to requiring compliance with water quality standards in an MS4 permit as a threshold matter, and they do not require us to continue to exercise our discretion as we decided in State Water Board Order

⁴⁵ *In re Los Angeles County Municipal Storm Water Permit Litigation* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase I Trial on Petitions for Writ of Mandate, pp. 4-5, 7. The decision was affirmed on appeal (*County of Los Angeles v. State Water Resources Control Board* (2006) 143 Cal.App.4th 985); however, this particular issue was not discussed in the court of appeal’s decision.

⁴⁶ *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d. 880, rev’d on other grounds sub nom. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2013) 133 S.Ct. 710, mod. by *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135.

⁴⁷ *Building Industry Assn. of San Diego County, supra*, 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377.

WQ 99-05. Although it would be inconsistent with USEPA's general practice of requiring compliance with water quality standards over time through an iterative process,⁴⁸ we may even have the flexibility to reverse⁴⁹ our own precedent regarding receiving water limitations and receiving water limitations provisions and make a policy determination that, going forward, we will either no longer require compliance with water quality standards in MS4 permits, or will deem good faith engagement in the iterative process to constitute such compliance.⁵⁰

However, with this Order, we now decline to do either. As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that many water quality standards are in fact not being met by many MS4s. The iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Compliance with water quality standards is and should remain the ultimate goal of any MS4 permit. We reiterate and confirm our determination that provisions requiring compliance with receiving water limitations are "appropriate for the control of . . . pollutants" addressed in MS4 permits and that therefore, consistent with our authority under the Clean Water Act, we will continue to require compliance with receiving water limitations.⁵¹

⁴⁸ See, e.g. Modified NPDES Permit No. DC0000022 for the MS4 for the District of Columbia, *supra*, fn. 17.

⁴⁹ Of course any change of direction would be subject to ordinary principles of administrative law. (See Code Civ. Proc., § 1094.5, subd. (b).)

⁵⁰ As such, it is not necessary to address the collateral estoppel arguments raised by the Environmental Petitioners and opposed by Permittee Petitioners. We agree that it is settled law that we have the discretion to require compliance with water quality standards in an MS4 permit under federal and state law. We also agree that it is settled law that the receiving water limitations provisions currently spelled out in our MS4 permits do not carve out a safe harbor in the iterative process. But the question for us is whether we should continue to exercise our discretion to utilize the same approach to receiving water limitations established under our prior precedent, or proceed in a new direction.

⁵¹ Several Permittee Petitioners argued in comments submitted on the first draft of this order that, because we find that we have some discretion under Clean Water Act section 402(p)(3) to not require compliance with receiving water limitations, the Los Angeles Water Board's action in requiring such compliance -- and our action in affirming it -- is pursuant to state authority. (See, e.g., Cities of Arcadia, Claremont, and Covina, Comment Letter, Jan. 21, 2015.) The Permittee Petitioners argue that the action is therefore subject to evaluation in light of the factors set out in Water Code section 13263 and 13241 pursuant to *City of Burbank*, *supra*, 35 Cal.4th 613. Under *City of Burbank*, a regional water board must consider the factors specified in section 13241 when issuing waste discharge requirements under section 13263, subdivision (a), but only to the extent those waste discharge requirements exceed the requirements of the federal Clean Water Act. (35 Cal.4th at 627.) Nowhere in our discussion in this section do we mean to disavow either that the Los Angeles Water Board acted under federal authority to impose "such other provisions as . . . determine[d] appropriate for the control of . . . pollutants" in adopting the receiving water limitations provisions of the Los Angeles MS4 Order in the first instance or that we are acting under federal authority in upholding those provisions. (33 U.S.C. § 1342(p)(3)(B)(iii).) The receiving water limitations provisions do not exceed the requirements of federal law. We nevertheless also point out that the Los Angeles Water Board engaged in an analysis of the factors under section 13241 when adopting the Order. (See Los Angeles MS4 Order, Att. F, Fact Sheet, pp. F-139 to F-155.)

As we explained in 2001, “[u]rban runoff is causing and contributing to impacts on receiving waters throughout the state and impairing their beneficial uses.”⁵² More than a decade later, this is still true. By definition, many of our urban waterways will never attain water quality standards and fully realize their beneficial uses if municipal runoff is allowed to continue to cause or contribute to exceedances of water quality standards. Further, the efforts of other dischargers who are required to not cause or contribute to exceedances of water quality standards would be largely in vain if we did not regulate MS4 dischargers with a somewhat even hand.

Such an approach is additionally consistent with the Porter-Cologne Act’s emphasis on water quality control plans as the cornerstone of water quality planning and regulation and the act’s expectation that all waste discharge requirements will implement the water quality control plans. We believe that direct enforcement of water quality standards is necessary to protect water quality, at a minimum as a back-stop where dischargers fail to meet requirements of the Order designed to achieve progress toward meeting the standards. We will not reverse our precedential determination in State Water Board Order WQ 99-05 that established the receiving water limitations provisions for MS4 permits statewide and reiterate that we will continue to read those provisions consistent with how the courts have: engagement in the iterative process does not excuse exceedances of water quality standards. We accordingly also decline to direct any revisions to the receiving water limitations provisions of the Los Angeles MS4 Order, which are consistent with our precedential language.⁵³

Yet, we are sympathetic to the assertions made by MS4 dischargers that the receiving water limitations provisions mandated by our Order WQ 99-05 may result in many years of permit noncompliance, because it may take years of technical efforts to achieve compliance with the receiving water limitations, especially for wet weather discharges.

⁵² State Water Board Order WQ 2001-15, p. 7.

⁵³ We disagree with Permittee Petitioners’ argument that the receiving water limitations in Part V.A of the Los Angeles MS4 Order are confusing, unclear, or overbroad, because they prohibit causing or contributing to a violation of a receiving water limitation rather than a violation of water quality standards. The Los Angeles Water Board defines “receiving water” as “[a] ‘water of the United States’ in to which waste and/or pollutants are or may be discharged.” (Los Angeles MS4 Order, Att. A., p. A-16.) The Los Angeles Water Board further defines “receiving water limitations” as “[a]ny applicable numeric or narrative water quality objective or criterion, or limitation to implement the applicable water quality objective or criterion, for the receiving water as contained in Chapter 3 or 7 of the Water Quality Control Plan for the Los Angeles Region (Basin Plan), water quality control plans or policies adopted by the State Water Board, or federal regulations, including but not limited to, 40 CFR §131.38.” (*Ibid.*) Receiving water limitations are therefore the water quality standards, including water quality objectives and criteria, that apply to the receiving water as expressed in the water quality control plan for the region, statewide water quality control plans that specify objectives for water bodies in the region, State Water Board policies for water quality control, and federal regulations.

Accordingly, we believe that the MS4 permits should incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.

With the WMP/EWMP provisions of the Los Angeles MS4 Order, the Los Angeles Water Board is striving to allow one such alternative compliance path. As such, the fundamental issue for review before us in this matter is whether the Los Angeles MS4 Order's WMP/EWMP provisions constitute a legal and technically sound compliance alternative for achieving receiving water limitations. We discuss and resolve this issue in the next section.

B. WMP/EWMP as Alternative Compliance Options for Complying with Receiving Water Limitations

The WMP/EWMP provisions allow Permittees to choose an integrated and collaborative watershed-based approach to meeting the requirements of the Los Angeles MS4 Order, including the receiving water limitations. Permittees develop a plan, either collaboratively or individually, that addresses water quality priorities within a watershed. Permittees first prioritize water quality issues within each watershed. Permittees may use the WMP/EWMP to address water body-pollutant combinations for which a TMDL has been developed, giving highest priority to those with interim and final compliance deadlines within the permit term. Permittees may also address water body-pollutant combinations for which no TMDL has been developed, but where the water body is impaired or shows exceedances of the standards for the relevant pollutant from an MS4 source. Once prioritization is completed, Permittees assess the sources of the pollutants and select watershed strategies that are designed to eliminate non-storm water discharges to the MS4 that are a source of pollutants, that meet all applicable TMDL-derived interim and final water quality-based effluent limitations (WQBELs) and/or limitations to be met in the receiving water (referred to herein as "other TMDL-specific limitations")⁵⁴ pursuant to corresponding compliance schedules, and that ensure that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations. Except as described below for storm water retention projects, Permittees conduct a "reasonable assurance analysis" for each water body-pollutant combination incorporated into the

⁵⁴ Some of the TMDL limitations of the Los Angeles MS4 Order are expressed not as WQBELs but as standards to be met in the receiving water. The Los Angeles MS4 Order refers to these limitations as "receiving water limitations;" however, in order to avoid confusion with the general receiving water limitations in Part V.A., we will use the term "other TMDL-specific limitations." Accordingly, while the Los Angeles MS4 Order uses the term "receiving water limitations" to refer to both the receiving water limitations in part V.A and some of the TMDL-based requirements in Attachments L-R, when we use the term we refer only to the receiving water limitations in part V.A.

WMP/EWMP to demonstrate the ability of the program to meet those objectives. Permittees additionally implement an integrated monitoring and assessment program to determine progress, adapting strategies and measures as necessary.⁵⁵

In addition to all the requirements above, for those Permittees that choose to develop and implement an EWMP, the EWMP provisions also require that Permittees collaborate on multi-benefit regional projects and, wherever feasible, retain all non-storm runoff, as well as all storm water runoff from the 85th percentile 24-hour storm event (hereinafter “storm water retention approach”) for the drainage areas tributary to the projects.⁵⁶

The primary controversy concerning the WMP/EWMP provisions of the Los Angeles MS4 Order is the manner in which they interact with the receiving water limitations and the WQBELs and other TMDL-specific limitations. Under certain conditions detailed in the Order, Permittees may be deemed in compliance with the receiving water limitations and the WQBELs and other TMDL-specific limitations by fully implementing the WMP/EWMP, rather than by demonstrating that the receiving water limitations and the WQBELs and other TMDL-specific limitations have actually been achieved. Specifically:

1. Permittees that develop and implement a WMP/EWMP and fully comply with all requirements and dates of achievement for the WMP/ EWMP as established in the Los Angeles MS4 Order, are deemed to be in compliance with the receiving water limitations in Part V.A for the water body-pollutant combinations addressed by the WMP/EWMP.⁵⁷

2. Permittees fully in compliance with the requirements and dates of achievement of the WMP/EWMP are deemed in compliance with the *interim* WQBELs and other TMDL-specific limitations in Attachments L-R for the water body-pollutant combinations addressed by the WMP/EWMP.⁵⁸

3. Permittees implementing an EWMP and utilizing the storm water retention approach in a drainage area tributary to the applicable water body are deemed in compliance with the *final* WQBELs and other TMDL-specific limitations in Attachments L-R for the water body-pollutant combinations addressed by the storm water retention approach.⁵⁹

⁵⁵ Los Angeles MS4 Order, Part VI.C., pp. 49-67.

⁵⁶ *Id.*, Part VI.C.1.g., pp. 48-49.

⁵⁷ *Id.*, Part VI.C.2.b., p. 52.

⁵⁸ *Id.*, Parts VI.C.3.a., p. 53, VI.E.2.d.i.4., pp. 143-44. The Los Angeles MS4 Order establishes separate requirements for Trash TMDLs and the WMP/EWMP are not a means of achieving compliance with the Trash TMDL provisions. (See Part VI.E.5, pp. 147-154.) References to TMDLs in this section exclude the Trash TMDLs.

⁵⁹ *Id.*, Part VI.E.2.e.i.(4), p. 145. As with Part VI.E.2.d.i.4, this Part does not apply to Trash TMDLs.

4. Because the Order additionally provides that full compliance with the general TMDL requirements in Part VI.E and the WQBELs and other TMDL-specific limitations in Attachments L through R constitutes compliance with the receiving water limitations in V.A for the specific pollutants addressed by the relevant TMDL,⁶⁰ provisions 2 and 3 above also constitute compliance with the receiving water limitations for the particular water body-pollutant combinations.

5. Finally, Permittees that have declared their intention to develop a WMP/EWMP may be deemed in compliance with receiving water limitations and with interim WQBELs with compliance deadlines occurring prior to approval of the WMP/EWMP if they meet certain conditions during the development phase.⁶¹

Both Environmental Petitioners and Permittee Petitioners put forth a number of arguments to the effect that the WMP/EWMP provisions of the Los Angeles MS4 Order are contrary to federal and state law or reflect poor policy. We discuss each argument below.

1. Anti-backsliding

The Environmental Petitioners argue that the inclusion of the WMP/EWMP in the Los Angeles MS4 Order violates the anti-backsliding provisions of the Clean Water Act and of the federal regulations.⁶² The Clean Water Act generally prohibits the relaxation of an effluent limitation established in an NPDES permit when that permit is renewed; the federal regulations include similar provisions. The Environmental Petitioners argue that the WMP/EWMP of the Los Angeles MS4 Order, by allowing a discharger to be deemed in compliance with receiving water limitations, even where a discharger may in fact be causing or contributing to an exceedance of a water quality standard, represent a relaxation of the receiving water limitations provisions contained in the 2001 Los Angeles MS4 Order.⁶³

We do not agree with the Environmental Petitioners that the WMP/EWMP provisions of the Los Angeles MS4 Order violate the anti-backsliding provisions of either the Clean Water Act or the federal regulations. Anti-backsliding provisions are an important aspect

⁶⁰ *Id.*, Part VI.E.2.c.ii., p. 143. Although this provision reflects a departure from provisions in previous MS4 permits, the provision has not generated controversy and has not been contested in the petitions. The State Water Board supports this provision in MS4 permits, as discussed at section II.B.5.b. of this order.

⁶¹ *Id.*, Parts VI.C. 2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144.

⁶² 33 U.S.C. § 1342(o); 40 C.F.R. §122.44(f).

⁶³ The receiving water limitations of the 2001 Los Angeles MS4 Order (like the receiving water limitations in Section V.A. of the Los Angeles MS4 Order) were modeled on the precedential language in State Water Board Order WQ 99-05.

of the Clean Water Act that generally promote continued progress toward clean water, but the provisions do not apply in all circumstances and are subject to certain exceptions. The 2001 Los Angeles MS4 Order required compliance with receiving water limitations, directed Permittees to achieve those limitations through the iterative process, but retained the Los Angeles Water Board's discretion to enforce compliance with the receiving water limitations at any time. The Los Angeles MS4 Order requires compliance with receiving water limitations, but allows implementation of control measures through the WMPs/EWMPs to constitute such compliance, and reserves direct enforcement of the receiving water limitations to situations where a permittee fails to comply with the WMP/EWMP provisions. The approaches under the prior and current orders are designed to achieve the same results – compliance with receiving water limitations – but through distinct paths that are not easily comparable for purposes of the specific, technical anti-backsliding requirements laid out in federal law.⁶⁴ We nevertheless discuss the provisions below.

The Clean Water Act contains both statutory anti-backsliding provisions in section 402(o) and regulatory anti-backsliding provisions in 40 C.F.R. section 122.44(f). The Clean Water Act's statutory prohibition against backsliding applies under a narrow set of criteria specified in Clean Water Act section 402(o). First, section 402(o) prohibits relaxing effluent limitations originally established based on best professional judgment, when there is a newly revised effluent limitation guideline.⁶⁵ The WMP/EWMP is not derived from an effluent limitation guideline, so this first prohibition is inapplicable. Second, section 402(o) prohibits relaxing effluent limitations imposed pursuant to Clean Water Act sections 301(b)(1)(C) or 303(d) or (e).⁶⁶ The receiving water limitations provisions in the 2001 Los Angeles MS4 Order were not

⁶⁴ Responding to an argument that NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia violated anti-backsliding requirements by removing certain numeric limitations in the prior permit, USEPA stated: "The Commenter implies that a Permit that replaces a numeric effluent limit with a non-numeric one is somehow automatically less stringent on that parameter. However, the narrative requirement only violates the anti-backsliding prohibition if the two provisions are comparable. . . . In this case, the two provisions are not comparable: EPA has determined that compliance with the performance standards in the Final Permit will result in more water quality protections for the DC MS4's receiving streams than did the previous aggregate numeric limit." (Responsiveness Summary, p. 84, *supra*, fn.17, citing *Communities for a Better Environment v. State Water Resources Control Bd.* (2005) 132 Cal. App. 4th 1313.)

⁶⁵ 33 U.S.C. § 1342(o)(1) ("In the case of effluent limitations established on the basis of subsection (a)(1)(B) of this section, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 1314 (b) of this title subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.").

⁶⁶ *Ibid.* ("In the case of effluent limitations established on the basis of section 1311 (b)(1)(C) or section 1313 (d) or (e) of this title, a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit except in compliance with section 1313 (d)(4) of this title.").

established based on either section 301(b)(1)(C) or section 303(d) or (e), so this prohibition on backsliding is inapplicable.⁶⁷ The receiving water limitations provisions in MS4 permits are imposed under section 402(p)(3)(B) of the Clean Water Act rather than under section 301(b)(1)(C),⁶⁸ and are accordingly not subject to the anti-backsliding requirements of section 402(o).

With respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(l), the non-applicability is less clear cut. USEPA promulgated 40 Code of Federal Regulations section 122.44(l)(1) and its predecessor anti-backsliding regulations prior to the Water Quality Act of 1987, which established the municipal permitting requirements of section 402(p)(3)(B). There is ample regulatory history to demonstrate USEPA's intent in establishing the anti-backsliding policy and regulations with respect to evolving technology standards for traditional point sources.⁶⁹ We have found no definitive guidance, however, since that time from USEPA or the courts applying the general provisions of section 122.44(l) in the context of municipal storm water permits.⁷⁰ Further, we have previously noted that anti-backsliding principles may be difficult to assess in the context of non-

⁶⁷ The Environmental Petitioners do not argue that the Los Angeles MS4 Order is contrary to Clean Water Act section 303(d)(4) (33 U.S.C. § 1313(d)(4)), which also sets out anti-backsliding requirements. Section 303(d)(4) sets out the conditions under which effluent limitations based on TMDL wasteload allocations may be relaxed. Specifically, effluent limitations for a discharge impacting an impaired water body where standards have not yet been attained may only be relaxed if either the cumulative effect of the revisions still assures the attainment of the water quality standards or the designated use that is not being attained is removed. (33 U.S.C. § 1313(d)(4)(A).) Where a water body has attained standards, effluent limitations may only be relaxed consistent with the federal antidegradation policy. (33 U.S.C. § 1313(d)(4)(B).)

⁶⁸ *Defenders of Wildlife, supra*, 191 F.3d at pp. 1165-1166.

⁶⁹ See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979) (describing codification of predecessor regulation codified at 40 C.F.R. 122.15(i).) In the context of municipal storm water, the MEP standard is the technology standard; the record here supports that MEP, as reflected in the permit conditions, has evolved since the issuance of the 2001 Los Angeles MS4 Order to become more stringent. (See, e.g., Los Angeles MS4 Order, Part VI.D.9.h.vii., p.132, compared to 2001 Los Angeles MS4 Order, Part 4.F.5.c., pp.48-49 [trash controls]; Los Angeles MS4 Order, Part VI.D.7.c., pp. 97-109, as compared to 2001 Los Angeles MS4 Order, Part 4.D.3., pp.36-37 [new development/redevelopment project performance criteria]; Los Angeles MS4 Order, Part VI.D.8.d., pp.113-114, as compared to 2001 Los Angeles MS4 Order, Part 4.E., pp.42-45 [requirements for construction sites less than one acre].)

⁷⁰ As requested by the Environmental Petitioners, we took official notice of a Letter to the Water Management Administration, Maryland Department of the Environment, issued by USEPA Region III on August 8, 2012. (See fn. 19). We acknowledge that the letter states at page 3 that a provision in the Prince George County, Maryland, Phase I MS4 draft permit allowing for more time to complete tasks that were required under the previous permit constituted backsliding. The letter refers in passing to section 122.44(l)(1), but the letter has no regulatory effect and, further, is devoid of any analysis. The Environmental Petitioners have also pointed us to discussion of the regulatory anti-backsliding provisions in the NPDES Permit Writers' Manual. (NPDES Permit Writers' Manual, p. 7-4.) The relevant section of the NPDES Permit Writers' Manual does not explicitly distinguish between municipal storm water permits and traditional NPDES Permits in its discussion of the applicability of regulatory anti-backsliding provisions; however, nor does it specifically direct application of the anti-backsliding regulatory provisions to municipal storm water permits. We do not find this discussion to be to be determinative on the issue.

quantitative, non-numeric requirements such as BMPs and plans.⁷¹ It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because, assuming for the sake of argument they do apply, the WMP/EWMP provisions would qualify for an exception to backsliding as discussed below.

Even if the receiving water limitations in MS4 permits could be considered subject to the anti-backsliding requirements of the Clean Water Act or the federal regulations, backsliding would be permissible based on the new information available to the Los Angeles Water Board when it developed and adopted the Los Angeles MS4 Order. The Clean Water Act and federal regulations contain exceptions to the anti-backsliding requirements where new information is available to the permitting authority that was not available at the time of the issuance of the prior permit and that would have justified the imposition of less stringent effluent limitations at that time.⁷² The Los Angeles Water Board makes a compelling argument in its October 15, 2013 Response that the development of 33 watershed-based TMDLs adopted since 2001, the inclusion and implementation of three of those TMDLs in the 2001 Los Angeles MS4 Order, and the TMDL-specific and general monitoring and analysis during implementation, have made new information available to the Los Angeles Water Board that fundamentally shaped the WMP/EWMP alternative of the Los Angeles MS4 Order. The Los Angeles Water Board states that the new information resulted in a new understanding that “time to plan, design, fund, operate and maintain [best management practices (BMPs)] is necessary to attain water quality improvements, and these BMPs are best implemented on a watershed scale.”⁷³ The Los Angeles Water Board further points out that, in terms of water supply, there has been a paradigm shift in the last decade from viewing storm water as a liability to viewing it as a regional asset, and that the Los Angeles MS4 Order was drafted to incorporate this new paradigm into its structure.

The WMP/EWMP approach represents a comprehensive attempt to implement the Board’s new understanding regarding how to make progress toward achieving water quality

⁷¹ See Order WQ 96-13 (*Save San Francisco Bay Association*) at pp. 8-10. Although the relevant portion of that decision primarily concerned Clean Water Act section 402(o), its analysis is equally instructive with respect to 40 C.F.R. section 122.44(l). (In passing, we note that the order appears to assume that the permit’s water quality-based requirements for the MS4 permit were derived pursuant to section 301(b)(1)(C); however, that assumption is in error based on the *Defenders of Wildlife* decision and subsequent State Water Board precedent.)

⁷² See 33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1) (anti-backsliding does not apply if the circumstances on which the previous permit was based have materially and substantially changed and would constitute cause for permit modification under 40 C.F.R. section 122.62); 40 C.F.R. § 122.62(a)(2) (stating that new information not available at the time the previous permit was issued is cause for modification); see also 40 C.F.R. §122.44(l)(2)(i)(B)(1).

⁷³ Los Angeles Water Board October 15, 2013 Response, p. 51.

standards as well as supporting the development of new water supplies.⁷⁴ The anti-backsliding requirements of the Clean Water Act and the federal regulations thus did not foreclose the incorporation of the WMP/EWMP alternatives into the Los Angeles MS4 Order even though the alternatives allow additional time to achieve receiving water limitations as compared to the immediate compliance required under the 2001 Los Angeles MS4 Order.

We shall amend Finding II.N. and Part III.D.4, page F-20, of Attachment F, Fact Sheet, as follows:

Finding II.N:

N. Anti-Backsliding Requirements. Section 402(o)(2) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit. **The Fact Sheet of this Order contains further discussion regarding anti-backsliding.**

Attachment F, Fact Sheet, Part III.D.4:

4. Anti-Backsliding Requirements. Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. ~~All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit.~~ **While this Order allows implementation of Watershed Management Plans/EWMPs to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations, does not violate the anti-backsliding provisions. The receiving**

⁷⁴ The Environmental Petitioners argue that information relied on to develop the WMP/EWMP approach was available to the Los Angeles Water Board at the time of the issuance of the 2001 Los Angeles MS4 Order, since regional and watershed based strategies and technologies in storm water planning, as well as the potential benefits of storm water for water supply, were considered prior to the last permit cycle. Similarly, the Environmental Petitioners argue that some of the data gathered through TMDL development was through the process of assessing impairments and through preparing drafts of the TMDL and was therefore available to the Los Angeles Water Board in 2001. (Environmental Petitioners, Written Comments, Jan. 21, 2015, pp. 15-17, 23-25.) The Environmental Petitioners have asked us to take official notice of several documents that support these assertions. It is not necessary for us to do so because we do not disagree with the Environmental Petitioners that some of the information that the Los Angeles Water Board has cited in support of an exception to the anti-backsliding requirements was available at the time of the adoption of the 2001 Los Angeles MS4 Order. We nevertheless concur with the Los Angeles Water Board that the more than a decade of implementation of storm water requirements, as well as the development and implementation of TMDL requirements, since 2001, has, as a whole, fundamentally reshaped our understanding of the physical and time scale on which such measures must be implemented to bring MS4s into compliance with receiving water limitations. Further, we find that all regional water boards are informed by the information gained in the Los Angeles region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region.

water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the WMP/EWMP provisions qualify for an exception to backsliding as based on new information. The Watershed Management Plan/EWMP provisions of this Order were informed by new information available to the Board from experience and knowledge gained through the process of developing 33 watershed-based TMDLs and implementing several of the TMDLs since the adoption of the previous permit. In particular, the Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

2. Antidegradation

The Environmental Petitioners argue that the WMP/EWMP provisions of the Los Angeles MS4 Order violate the federal and state antidegradation policies.⁷⁵ The federal and state antidegradation policies generally require that the existing quality of water bodies be maintained, unless degradation is justified through specific findings. At a minimum, any degradation may not lower the quality of the water below the water quality standards.⁷⁶

The federal and state antidegradation policies are not identical; however, where the federal antidegradation policy is applicable, the State Water Board has interpreted State Water Board Resolution No. 68-16, the state antidegradation policy, to incorporate the federal antidegradation policy.⁷⁷ In the context of the Los Angeles MS4 Order, a federal NPDES permit, compliance with the federal antidegradation policy would require consideration of the following: First, the Los Angeles MS4 Order must ensure that “existing instream uses and the level of

⁷⁵ 40 C.F.R. § 131.12; State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (State Water Board Resolution No. 68-16).

⁷⁶ *Ibid.*

⁷⁷ State Water Board Order WQ 86-17 (*Fay*), pp. 16-19.

water quality necessary to protect the existing uses” is maintained and protected.⁷⁸ Second, if the baseline quality of a water body for a given constituent “exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected” through the requirements of the Los Angeles MS4 Order unless the Los Angeles Water Board makes findings that (1) any lowering of the water quality is “necessary to accommodate important economic or social development in the area in which the waters are located;” (2) “water quality adequate to protect existing uses fully“ is assured; and (3) “the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control” are achieved.⁷⁹

The Los Angeles MS4 Order must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy.⁸⁰ In particular, the Los Angeles Water Board must find that not only present, but also anticipated future uses of water are protected, and must ensure “best practicable treatment or control” of the discharges.⁸¹ The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.⁸²

⁷⁸ 40 C.F.R. § 131.12(a)(1). This provision has been interpreted to mean that, “[i]f baseline water quality is equal to or less than the quality as defined by the water quality objective, water quality shall be maintained or improved to a level that achieves the objectives.” (State Water Board, Administrative Procedures Update, Antidegradation Policy Implementation for NPDES Permitting, 90-004 (APU 90-004), p. 4.) This provision is completely consistent with, and implemented by, the receiving water limitations provisions discussed above.

⁷⁹ 40 C.F.R. § 131.12(a)(2); see also State Water Board Resolution No. 68-16, Resolve 2. The federal regulations additionally require strict maintenance of water quality for “outstanding national resources.” (40 C.F.R. § 131.12(a)(3).) There are no designated outstanding national resource waters covered by the Los Angeles MS4 Order.

⁸⁰ See State Water Board Order WQ 86-17 (*Fay*), p. 23, fn. 11.

⁸¹ State Water Board Resolution No. 68-16, Resolve 2. Best practicable treatment or control is not defined in Resolution No. 68-16; however, the State Water Board has evaluated what level of treatment or control is technically achievable using “best efforts.” (See State Water Board Orders WQ 81-5 (*City of Lompoc*), WQ 82-5 (*Chino Basin Municipal Water District*), WQ 90-6 (*Environmental Resources Protection Council*.) A Questions and Answers document on Resolution No. 68-16 by the State Water Board states as follows: “To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g. through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers . . . The costs of the treatment or control should also be considered . . .” (Questions and Answers, Resolution No. 68-16, State Water Board (Feb. 16, 1995), pp. 5-6.)

⁸² APU 90-004, p.4. The baseline for application of the federal antidegradation policy is 1975. For state antidegradation requirements, see also *Asociacion de Gente Unida por el Agua v. Central Valley Water Board* (2012) 210 Cal.App.4th 1255, 1270. The baseline for the application of the state antidegradation policy is generally the highest water quality achieved since 1968. However, where a water quality objective for a particular constituent was adopted after 1968, the baseline for that constituent is the highest water quality achieved since the adoption of the (*Continued*)

The Los Angeles MS4 Order contains a conclusory antidegradation finding, but the Fact Sheet contains additional discussion.⁸³ The Fact Sheet discussion essentially conveys that, where there are high quality waters in the region, the antidegradation requirements are met because the Order requires best practicable treatment or control in the form of MEP and water quality standards compliance and, further, where the water quality is already impaired, the Order requires implementation of TMDL requirements to achieve water quality standards over time. The Fact Sheet also finds that the Los Angeles MS4 Order does not authorize an increase in waste discharges. The Los Angeles Water Board argues that it was not required to make more detailed findings because, using its best professional judgment and available data, it concluded that the Los Angeles MS4 Order would prevent any degradation. For this proposition, the Los Angeles Water Board cites to State Water Board guidance from 1990 (APU 90-004).⁸⁴ The guidance may be construed to exempt the Los Angeles Water Board from conducting an extensive pollutant by pollutant analysis for each water body in the region, but it does not exempt the Board from clearly stating its basis for finding that its action is consistent with the antidegradation policies.

The Los Angeles Water Board has provided a more extensive analysis of why the Los Angeles MS4 Order complies with the antidegradation policies in its October 15, 2013 Response. The Los Angeles Water Board argues that most of the water bodies impacted by the Los Angeles MS4 Order are already impaired for multiple constituents and that, even if some of these water bodies may have been higher quality in 1968, a scenario largely contradicted by the available data,⁸⁵ the appropriate baseline for the quality of such waters is the level of control achieved under the prior permit. The Los Angeles Water Board further argues that the Los Angeles MS4 Order has provisions that are equally or more stringent than those of the

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objective. Resolution 68-16 requires a comparison of the existing quality to “the quality established in policies as of the date on which such policies become effective.” (Resolution 68-16, Resolve 1.)

⁸³ Los Angeles MS4 Order, Finding II.M; Fact Sheet, Att. F, pp. F19-F20.

⁸⁴ APU 90-004, p. 2.

⁸⁵ We reviewed the Administrative Record, including the 1998 Clean Water Act section 303(d) List (May 12, 1999) (Administrative Record, section 10.VI.E., RB-AR35684-35733), the 2010 Clean Water Act section 303(d) List (Oct. 11, 2011) (Administrative Record, section 10.VI.E., RB-AR35734-35785), Santa Monica Bay Restoration Project, An Assessment of Inputs of Fecal Indication Organisms and Human Enteric Viruses from Two Santa Monica Bay Storm Drains (1990) (Administrative Record, section 10.VI.E., RB-AR43363-43413), Toxic Substances Monitoring Program, 10 Year Summary Report 1978-1987 (Administrative Record, Order No. 01-182, R0044602-0045053) and comments submitted by interested persons to the Los Angeles Water Board (Administrative Record RB-AR1006-1038, RB-AR1100-1128, RB-AR1768-2119, RB-AR2653-2847, RB-AR5642-17888). We found no specific evidence presented to the Los Angeles Water Board of high quality waters in the region with regard to pollutants typically associated with storm water discharges; however, we also recognize that in the absence of specific evidence of high quality waters, a blanket statement that there are no high quality water body-pollutant combinations may be overbroad.

2001 Los Angeles MS4 Order and therefore will not allow water quality to degrade below the level of control achieved under the prior permit.

We agree with the Los Angeles Water Board that the Los Angeles MS4 Order maintains and improves the level of control achieved under the 2001 Los Angeles MS4 Order. We expect that the Los Angeles MS4 Order's TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region. To assert, as the Environmental Petitioners do, that compliance with the receiving water limitations provisions of the 2001 Los Angeles Order is more stringent than establishing specific implementation requirements with clear deadlines for TMDL and receiving water limitations compliance is misguided. We are concerned with the totality of the provisions in the two permits and find that, viewed from that broader perspective, the Los Angeles MS4 Order is at least as stringent in addressing degradation as its predecessor.⁸⁶ The Los Angeles MS4 Order improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality.⁸⁷ In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation.

We are not persuaded, however, that the level of control achieved under the 2001 Los Angeles MS4 Order necessarily represents the baseline for purposes of an antidegradation analysis. The 2001 Los Angeles MS4 Order had only minimal findings regarding antidegradation and it is not apparent that any degradation that may have continued under the conditions of the 2001 Los Angeles MS4 Order was anticipated by the Los Angeles Water Board and supported with appropriate analysis regarding economic and social benefits⁸⁸ and best practicable treatment or control. We therefore find that the appropriate baseline remains 1968 or the highest quality of receiving waters attained since 1968. We acknowledge

⁸⁶ In making this finding we also recognize that the Permittees may be deemed in compliance with receiving water limitations prior to approval of the WMP/EWMP. (Los Angeles MS4 Order Parts VI.C.2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144.) As discussed further under section II.B.6., we find that the Los Angeles Water Board reasonably exercised its discretion in allowing for compliance during the program development phase and further that the program development phase does not detract from the overall effectiveness of the permit provisions.

⁸⁷ See *Asociacion de Gente Unida, supra*, 210 Cal.App.4th at p. 1278.

⁸⁸ We note that the administrative record provides evidence that some discharge of storm water is to the maximum benefit of the people of the state because such discharge is necessary for flood control and public safety and helps accommodate development. (See, e.g., Administrative Record, section 10.VI.C, RB-AR30101; RB-AR32557-32558.)

that the evidence in the record indicates that it is unlikely that many water bodies were high quality even as far back as 1968, but we cannot make a blanket statement to that effect.⁸⁹

Despite this conclusion, we will not remand the antidegradation issue to the Los Angeles Water Board for further consideration, but will make the findings ourselves based on the record before us. Our findings are necessarily made at a generalized level. Even if the directive of APU 90-004 to carry out a complete antidegradation analysis for each water body-pollutant combination is applicable here, there is simply insufficient data available (to us or the Los Angeles Water Board) to make such findings. The APU 90-004 contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering antidegradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, region, especially given that reliable data on the baseline water quality from 1968 is not available.⁹⁰

The Environmental Petitioners propose that antidegradation be addressed in subsequent actions of the Los Angeles Water Board by requiring that the reasonable assurance analysis (discussed in greater detail in section II.B.4.c. of this Order) supporting a WMP/EWMP also demonstrate that the proposed control measures will maintain high quality of waters with regard to pollutants for which they are not impaired. We reject this approach for two reasons. First, the Los Angeles Water Board was required under the federal and state antidegradation policies to evaluate whether permit conditions would lead to degradation of high quality waters at the time of permit issuance. Second, requiring Permittees to incorporate an evaluation of all water body-pollutant combinations, including those where there are no impairments or exceedances, would require them to expand the reasonable assurance analysis beyond its useful function and manageable scope.

We shall amend Finding II.M and Part D.3 at pages F-19 to F-20 of Attachment F, the Fact Sheet, as follows:

⁸⁹ See fn. 85.

⁹⁰ We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.)

Finding II. M.

M. Antidegradation Policy

40 CFR section 131.12 requires that state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16 **as set out in the Fact Sheet.**

Attachment F, Fact Sheet Part III.D.3.

3. Antidegradation Policy. 40 CFR section 131.12⁴ requires that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in [State Water Board Resolution No. 68-16](#) ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Resolution No. 68-16 and 40 CFR section 131.12 require the Regional Water Board to maintain high quality waters of the State **unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.** until it is demonstrated that any change in quality will

~~be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies. Resolution 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR section 131.12 and Resolution 68-16 **as set out in the Findings below:-**

1. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Permittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR section 122.44(a), the Permittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p). Many of the waters within the area covered by this Order are impaired and **for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are** listed on the State's CWA Section 303(d) List and either the Regional Water Board or USEPA has established TMDLs to address the impairments. **This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected.** This Order requires the Permittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. **This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Part V.A and the Permittee's monitoring and reporting program pursuant to Part VI.B or by implementing Watershed Management Programs/EWMPs with a compliance schedule.** This Order includes requirements to develop and implement storm water management programs, achieve water quality-based effluent limitations, and effectively prohibit non-storm water discharges through the MS4.

2. To the extent that some of the water bodies within the jurisdiction are high quality waters with regard to some constituents, this Order finds as follows:

a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the

area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

b. The Order requires the highest statutory and regulatory requirements and requires that the Permittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Permittees must comply with the “maximum extent practicable” technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to Order No. 01-182. The Order incorporates options to implement Watershed Management Programs or EWMPs that must specify concrete and detailed structural and non-structural storm water controls that must be implemented in accordance with an approved time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

~~The issuance of this Order does not authorize an increase in the amount of discharge of waste. The Order includes new requirements to implement WLAs assigned to Los Angeles County MS4 discharges that have been established in 33 TMDLs, most of which were not included in the previous Order.~~

3. Compliance Schedules and the Appropriateness of Enforcement Orders

The Environmental Petitioners concede that immediate compliance with receiving water limitations is not achievable in many instances and that some additional time to reach compliance is warranted. They have proposed an alternative to the WMP/EWMP that would incorporate many of the provisions of those programs but require implementation through the mechanism of a time schedule order or other enforcement order rather than as permit conditions. The Los Angeles MS4 Order already provides that Permittees who are out of compliance with final WQBELs and other TMDL-specific limitations may request a time schedule order.⁹¹ Under the alternative proposed by the Environmental Petitioners, all Permittees that are currently out of compliance with receiving water limitations not addressed by a TMDL as well as with interim TMDL requirements with passed compliance deadlines, would be issued a time schedule order or other enforcement order not to exceed the five year term of

⁹¹ Los Angeles MS4 Order, Part VI.E.4., pp.146-147.

the permit. The Permittees would then implement a WMP/EWMP type plan to achieve compliance with the appropriate limitations within the confines of the enforcement order.

In the prior two sections, we found that the WMP/EWMP provisions are not contrary to the anti-backsliding or antidegradation requirements of federal and state law. We therefore disagree with the Environmental Petitioners that the relevant provisions must be stricken from the Order and incorporated instead into an enforcement order for those reasons. We also find that, given that strict compliance with water quality standards is discretionary in MS4 permits, the Los Angeles Water Board was not restricted to limiting the schedule for compliance with receiving water limitations to the term of the Los Angeles MS4 Order.

Further, from a policy perspective, we find that the MS4 Permittees that are developing and implementing a WMP/EWMP should be allowed additional time to come into compliance with receiving water limitations and interim and final TMDLs through provisions built directly into their permit, rather than through enforcement orders. Building a time schedule into the permit itself, as the Los Angeles MS4 Order does, is appropriate because it allows a more efficient regulatory structure compared to having to issue multiple enforcement orders. More importantly, it is appropriate to regulate Permittees in a manner that allows them to strive for compliance with the permit terms, provided no provision of law otherwise precludes including the schedule in the NPDES permit. For example, for traditional point source discharges subject to strict compliance with water quality standards pursuant to section 301(b)(1)(C), the terms of a compliance schedule are dictated by our compliance schedule policy (State Water Board Resolution 2008-0025) and any additional time for compliance could only be under the auspices of an enforcement order outside the permit.⁹²

The WMP/EWMP provisions constitute an effort to set ambitious, yet achievable, targets for Permittees; receiving water limitations, on the other hand, while the ultimate goal of MS4 permitting, may not in all cases be achievable within the five-year permit cycle. Generally, permits are best structured so that enforcement actions are employed when a discharger shows some shortcoming in achieving a realistic, even if ambitious, permit condition and not under circumstances where even the most diligent and good faith effort will fail to achieve the required condition. We add that it is our intention to encourage a watershed-based approach to addressing storm water issues going forward and that it would be contrary to that intention to

⁹² We also note that the State Water Board's Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (2005) (State Implementation Policy) and the CTR itself (40 C.F.R. § 131.38(e)) restrict the scope of compliance schedules for effluent limitations addressing the discharge of toxic pollutants; however the policy does not apply to storm water discharges. (State Implementation Policy, p.3, fn.1.)

structure the watershed-based requirements as an enforcement order. We will not require Permittees that propose and timely implement a WMP/EWMP to request time schedule orders or other enforcement orders as a precondition of being in compliance with the receiving water limitations or interim TMDL requirements of the Los Angeles MS4 Order.

While declining to structure the WMP/EWMP provisions generally as an enforcement order, we acknowledge that time schedule orders are appropriate under some circumstances. We have already noted that the Los Angeles MS4 Order allows a Permittee to request a time schedule order where a final compliance deadline for a state-adopted TMDL has passed and the Permittee believes that additional time to comply with the requirement is necessary.⁹³ We expect that a Permittee will request a time schedule order also if the Permittee fails to meet a final compliance deadline for a TMDL after the adoption date of the Los Angeles MS4 Order. We will also provide that a Permittee may request a time schedule order if the Permittee fails to meet a final compliance deadline for a receiving water limitation set in the Permittee's WMP/EWMP.

We shall add a new Part VI.C.6.b and revise Part VI.E.4.b as follows:

Part VI.C.6

b. Where a Permittee believes that additional time to comply with a final receiving water limitation compliance deadline set within a WMP/EWMP is necessary, and the Permittee fails to timely request or is not granted an extension by the Executive Officer, a Permittee may, no less than 90 days prior to the final compliance deadline, request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

Part VI.E.4

b. Where a Permittee believes that additional time to comply with the final water quality-based effluent limitations and/or receiving water limitations is necessary, a Permittee may within 45 days of Order adoption, **or no less than 90 days prior to the final compliance deadline if after adoption of the Order,** request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

4. Rigor and Accountability in the WMPs/EWMPs

We now turn to a consideration, from a technical as well as policy lens, as to whether the WMPs/EWMPs are structured in a manner that will maximize the likelihood of

⁹³ *Ibid.*

reaching the ultimate goal of the compliance alternative – achieving receiving water limitations.⁹⁴ We can support an alternative approach to compliance with receiving water limitations only to the extent that that approach requires clear and concrete milestones and deadlines toward achievement of receiving water limitations and a rigorous and transparent process to ensure that those milestones and deadlines are in fact met. Conversely, we cannot accept a process that leads to a continuous loop of iterative WMP/EWMP implementation without ultimate achievement of receiving water limitations.

We find below that the WMP/EWMP provisions generally ensure the appropriate rigor, transparency, and accountability, and that, with the few revisions we direct, are designed to lead to achievement of receiving water limitations.⁹⁵

a. Milestones and Compliance Deadlines

We first consider whether the WMP/EWMP provisions require clear, concrete, and finite milestones and deadlines.

For water body-pollutant combinations addressed by TMDLs, the Los Angeles MS4 Order requires the Permittees to incorporate the compliance schedules found in Attachments L through R of the Order, which reflect previously adopted TMDL-based requirements, into the WMP/EWMP, and, as necessary, to develop interim milestones and dates for their achievement.⁹⁶ A Permittee that does not thereafter comply with the approved compliance schedule must instead demonstrate compliance with the WQBELs and other TMDL-specific limitations of the Order.⁹⁷ For water body-pollutant combinations not addressed by a TMDL, but where the relevant pollutant is one for which the water body is identified as impaired on the Clean Water Act section 303(d) List and the pollutant is in the same class as a TMDL pollutant, the Order requires that the WMP/EWMP incorporate a schedule consistent with the TMDL schedule for the same class pollutant.⁹⁸ A Permittee that does not thereafter comply with

⁹⁴ From a legal standpoint, our analysis serves to verify that the Los Angeles MS4 Order's alternative compliance approach through WMPs/EWMPs is supported by the findings and by evidence in the record. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506.)

⁹⁵ We do not agree with Permittee Petitioners that the WMP/EWMP provisions are precluded by the program requirements of 40 Code of Federal Regulations section 122.26. Nor do we agree that the requirements are vague or lack definition. The WMP/EWMP provisions of the Order are guidelines for development of a subsequent program with more specificity to be approved by the Los Angeles Water Board or its Executive Officer.

⁹⁶ Los Angeles MS4 Order, Part VI.C.5.c., pp.64-65.

⁹⁷ *Id.*, Part VI.E.2.d.i(4)(c), p.144.

⁹⁸ *Id.*, Part VI.C.2.a.i., pp. 49-50.

the approved compliance schedule must instead demonstrate immediate compliance with the receiving water limitations in Part V.A.⁹⁹ We will not disturb these provisions.

With regard to exceedances of receiving water limitations not addressed by a TMDL, and where the pollutant is not in the same class as a pollutant addressed by a TMDL, the Order requires that the WMP/EWMP include milestones based on measurable criteria or indicators and a schedule for achieving the milestones. The WMP/EWMP must also incorporate a final date for achievement of receiving water limitations, but that date is circumscribed simply as “as soon as possible.”¹⁰⁰ Parts VI.C.2.a.ii.(4) and VI.C.2.a.iii.(2)(c) help clarify the meaning of “as soon as possible:”

Permittees shall identify enforceable requirements and milestones and dates for their achievement to control MS4 discharges such that they do not cause or contribute to exceedances of receiving water limitations within a timeframe(s) that is as short as possible, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary. The time between dates shall not exceed one year. Milestones shall relate to a specific water quality endpoint (e.g., x% of the MS4 drainage area is meeting the receiving water limitations) and dates shall relate either to taking a specific action or meeting a milestone.¹⁰¹

We will make a revision to the compliance schedule provisions to make it clear that the term “as soon as possible” is to be interpreted consistent with the more specific direction cited above. However, because the WMP/EWMP, and therefore the proposed compliance schedule, is subject to public review and comment and approval by the Los Angeles Water Board or its

⁹⁹ *Id.*, Part VI.C.2.c., p.52.

¹⁰⁰ *Id.*, Part VI.C.5.c.iii.(3), p. 65. If the pollutant is not in the same class as those addressed in a TMDL, but the water body is still identified as impaired for that pollutant, the WMP/EWMP must either have a final compliance deadline within the 5 year permit term or Permittees are expected to initiate development of a stakeholder-proposed TMDL and incorporate a compliance schedule consistent with the TMDL. (*Id.*, Part VI.C.2.a. ii., pp. 50-51) (If the exceedances are in a drainage area implementing the storm water retention approach, there is no requirement to initiate the TMDL development process.) The requirement to address receiving water limitations is ongoing. As exceedances are found through monitoring for water body-pollutant combinations not identified on the 303(d) List, Permittees must either meet receiving water limitations or include the water body-pollutant combination in the WMP/EWMP and set enforceable requirements and milestones and dates for their achievement within a time frame that is as short as possible. (*Id.*, Part VI.C.2.a.iii, pp. 51-52.) Permittees are deemed in compliance with receiving water limitations only for water body-pollutant combinations addressed in the WMP/EWMPs. Thus, as pointed out by several interested parties, for lower priority water body-pollutant combinations not incorporated into a WMP/EWMP for which exceedances are detected, Permittees may be in violation of the receiving water limitations. A Permittee always has the ability to reprioritize a water body-pollutant combination from low priority to high priority and amend its WMP/EWMP to incorporate measures to address that water body-pollutant combination.

¹⁰¹ *Id.*, Parts VI.C.2.a.ii.4, p. 50, VI.C.2.a.iii.(2)(c), p. 51 (identical language).

Executive Officer,¹⁰² we do not find it necessary to constrain the determination of milestones and dates for the achievement of receiving water limitations any further.

We shall amend Part VI.C.5.c.iii.(3)(b) as follows:

- (b) A final date for achieving the receiving water limitations as soon as possible, **consistent with Parts VI.C.2.a.ii.(4) & VI.C.2.a.iii.(2)(c).**

b. Constraints on Extension of Deadlines

The fact that the Los Angeles MS4 Order requires the establishment of concrete and rigorous deadlines within the WMP/EWMP for the achievement of receiving water limitations is critical to ensuring progress on such achievement; however, the Order also contemplates that the deadlines, with the exception of those compliance deadlines established in a TMDL, may be extended.¹⁰³ The WMP/EWMP is subject to an adaptive management process. Based on the results of that process the Permittees may propose modifications, including modifications to compliance deadlines and interim milestones, in the Annual Report.¹⁰⁴

The potential for multiple extensions is nevertheless ameliorated by the fact that extensions of compliance deadlines and interim milestones require Los Angeles Water Board Executive Officer approval,¹⁰⁵ and are accordingly, subject to a 30-day public comment period.¹⁰⁶ The public comment period will allow all other interested persons to weigh in on the appropriateness of any requested extensions. If thereafter dissatisfied with the determination made by the Executive Officer, interested persons may additionally seek review of the Executive Officer's decision by the Los Angeles Water Board.¹⁰⁷ Of course, in cases where no extension

¹⁰² *Id.*, Part VI.C.4.c., p.56, Table 9, p. 54, Part VI.A.5.b., p. 42, Att. F, Fact Sheet, p. F-42. Under Part VI.A.5.b, “[a]ll documents submitted to the Regional Water Board Executive Officer for approval shall be made available to the public for a 30-day period to allow for public comment.”

¹⁰³ *Id.*, Parts VI.C.7, p.66, VI.C.8, pp.66-67.

¹⁰⁴ *Id.*, Part, VI.C.8, p.67. Under another provision of the Order, Permittees may at any time request an extension of deadlines for achievement of interim milestones established to address exceedances of receiving water limitations not otherwise addressed by a TMDL. (*Id.*, Part VI.C.6.a., p.65.) (We note that the cited provision refers to “milestones established pursuant to Part VI.C.4.c.ii.(3),” but the intent appears to have been to reference Part VI.C.5.c.iii.(3).) But as we read the Los Angeles MS4 Order, extensions of not just interim deadlines for achievement of milestones but also final compliance deadlines to achieve receiving water limitations are already allowed under the adaptive management provisions of Part VI.C.8.a.ii.: “Based on the results of the adaptive management process, Permittees shall report any modifications, including where appropriate *new compliance deadlines* and interim milestones, with the exception of those compliance deadlines established in a TMDL, necessary to improve the effectiveness of the Watershed Management Program or EWMP, in the Annual Report” (Emphasis added.)

¹⁰⁵ *Id.*, Parts VI.C.8, p.67, VI.C.6.a., p.65. We recognize that as currently written the adaptive management provisions in effect deem any modifications to the WMPs/EWMPs approved if the Executive Officer “expresses no objections” within 60 days. (*Id.*, Part VI.C.8.a.iii., p. 67.) With our revisions, any deadline extensions must be affirmatively approved by the Executive Officer.

¹⁰⁶ *Id.*, Part VI.A.5.b, p. 42.

¹⁰⁷ *Id.*, Part VI.A.6, p.42.

is available, as with final deadlines established in TMDLs,¹⁰⁸ or where no extension is requested or granted, failure to meet a deadline means that the Permittee will have to comply from that time forward with the receiving water limitations or WQBELs and other TMDL-specific limitations or request a time schedule order. Therefore, Permittees cannot rely on the certainty of a deadline extension, and Permittees have a strong incentive to implement control measures that will in fact get them to compliance by the established deadline. Given that the Permittees and the Los Angeles Water Board are working with limited data¹⁰⁸ regarding storm water impacts and control measure performance, especially where TMDLs have not been developed, we are hesitant to remove all flexibility for deadline extensions, and find that the Order strikes an appropriate balance.

Permittee Petitioners seek even greater flexibility under the WMP/EWMP provisions for adjusting approved control measures and time lines. They advocate for amendments that would allow a Permittee to propose alternative controls or time lines upon a demonstration that required controls for timely achievement of a limitation are either technically infeasible or otherwise constitute a substantial hardship to the Permittee. We have found above that, in the case of final deadlines set in the WMP/EWMP for achievement of receiving water limitations not otherwise addressed in a TMDL, the Los Angeles MS4 Order already provides for an opportunity to propose new deadlines through the adaptive management process. We will make a clarifying revision below to confirm that Permittees may ask for extensions in meeting receiving water limitations not addressed by a TMDL. Technical infeasibility or substantial hardship may be grounds for such a request. The Los Angeles Water Board Executive Officer, in turn, may, after allowing for public review and comment, choose to (1) extend the deadline, (2) decline the extension but approve any time schedule order requested by the Permittee, or (3) decline the extension and not approve a time schedule order, with the result that the Permittee will be out of compliance with the provision of the WMP/EWMP and therefore the receiving water limitations of Part V.A. As stated previously, interested persons may thereafter ask the Los Angeles Water Board to review the Executive Officer's determination.¹⁰⁹

With regard to final deadlines for WQBELs and other TMDL-specific limitations, we will not amend the WMP/EWMP provisions to add flexibility for extensions. We find that the only option appropriately available to a Permittee unable to meet final deadlines that are set out in a TMDL and incorporated into the Los Angeles MS4 Order and the WMP/EWMPs, is to

¹⁰⁸ *Id.*, Part VI.C.8.a.ii., p.67.

¹⁰⁹ *Id.*, Part VI.A.6, p.42.

request a time schedule order, consistent with Part VI.E.2.e. of the Order, as that Part was amended in section II.B.3. above.¹¹⁰

We shall amend Part VI.C.6.a as follows:

- a. Permittees may request an extension of deadlines for achievement of interim milestones **and final compliance deadlines** established pursuant to Part VI.C.45.c.iii.(3) ~~only~~, **with the exception of those final compliance deadlines established in a TMDL**. Permittees shall provide requests in writing at least 90 days prior to the deadline and shall include in the request the justification for the extension. Extensions ~~shall be subject to approval by~~ **must be affirmatively approved by** the Regional Water Board Executive Officer, **notwithstanding Part VI.C.8.a.iii.**

c. Rigor and Accountability in the Process

We see three additional components of the WMPs/EWMPs as essential to ensuring that the proposed WMPs/EWMPs are in fact designed to achieve receiving water limitations within the appropriate time frame.

First, as documents to be approved by either the Los Angeles Water Board or its Executive Officer, the WMPs/EWMPs are subject to a public review and comment period.¹¹¹ Such review includes consideration of proposed control measures, deadlines for achievement of final limitations, and the reasonable assurance analysis that supports the WMP/EWMP. We expect this public process to vet the proposed WMPs/EWMPs and facilitate revisions to strengthen the programs as needed, thereby providing some assurance that approved WMPs/EWMPs will achieve the water quality targets set out.

Second, the requirement for a reasonable assurance analysis in particular is designed to ensure that Permittees are choosing appropriate controls and milestones for the WMP/EWMP.¹¹² Competent use of the reasonable assurance analysis should facilitate achievement of final compliance within the specified deadlines.¹¹³

¹¹⁰ Final TMDL deadlines are established and incorporated into the Basin Plans during the TMDL development process. That process invites stakeholder participation and the proposed schedule is subject to public review and comment and approval by the relevant regional water board, the State Water Board, and USEPA. The deadlines are established with consideration of the time needed for compliance for all dischargers contributing to an impairment, including industrial and construction storm water dischargers and traditional NPDES dischargers. Although we recognize that it may not always be feasible for municipal storm water dischargers to meet final TMDL deadlines, short of amending the Basin Plan to modify the deadlines (see *California Association of Sanitation Agencies v. State Water Resources Control Board* (2012) 208 Cal.App.4th 1438), we find it appropriate for the dischargers to request time schedule orders rather than be granted an extension within the provisions of the Los Angeles MS4 Order.

¹¹¹ See Los Angeles MS4 Order, Parts VI.C.4.d., p. 57, VI.C.6, p. 65, Table 9, p.54; see also *id.*, Part VI.A.5., p. 42.

¹¹² *Id.*, Part VI.C.5.b.iv.(5), pp. 63-64.

¹¹³ We note that the Los Angeles Water Board has released guidance on the development of a reasonable assurance analysis. The guidance was released after adoption of the Los Angeles MS4 Order and accordingly is not (*Continued*)

Third, the adaptive management provisions of the Order ensure that the Permittees will evaluate monitoring data and other new information every two years and consider progress up to that point on achieving WQBELs and other TMDL-specific limitations. Permittees are required as part of the adaptive management process to propose modifications to improve the effectiveness of the WMP/EWMP and implement those modifications.¹¹⁴

While we are supportive of all of these measures, we find that they should be strengthened. As a preliminary matter, we will require the Permittees to submit specific information, concurrently with the two-year adaptive management process, that will assist the Los Angeles Water Board in determining how effective the WMP/EWMP path is in spurring the completion of on-the-ground structural control measures that lead to measurable water quality improvement. As we discuss further in Section II.B.8 of this Order, we will direct the Los Angeles Water Board to report to the State Water Board periodically on the effectiveness of the WMP/EWMP approach and expect the additional information submitted by the Permittees to inform that report.

More significantly, we will add a provision that requires Permittees to comprehensively update the reasonable assurance analysis and the WMP/EWMP, following an opportunity to implement the adaptive management process. Given the limitations inherent in models, as well as the potential incentive to choose the lowest effort and cost level predicted by the model to achieve receiving water limitations,¹¹⁵ we are concerned that reliance on one initial reasonable assurance analysis is insufficient to ensure that in the long term WMPs/EWMPs will

(continued from previous page)

part of the Administrative Record. We nevertheless take this opportunity to state that we expect any revisions and updates to the guidance to be subject to a public process as part of reissuance of the Los Angeles MS4 Order.

¹¹⁴ Los Angeles MS4 Order, Part VI.C.8., pp. 66-67. We add that the adaptive management process will also allow Permittees to revise their WMPs/EWMPs to take advantage of funding opportunities as they arise in the future, including funding opportunities through Assembly Bill 2403 (approved by Governor, June 28, 2014 (2013-2014 Reg. Sess.)) and Proposition 1 (approved by ballot Nov. 4, 2014). We are cognizant of criticism that the adaptive management process is just another version of the ineffective iterative process of the receiving water limitations. These arguments are misplaced. Unlike the iterative process of the receiving water limitations, the adaptive management process is only one component of a series of actions required under the WMP/EWMP and acts as a periodic check to ensure that all the other requirements are achieving the stated goals of the WMP/EWMP within clearly stated deadlines. As our discussion above makes clear, we would not endorse an alternative compliance path with the sole requirement to adaptively manage implemented control measures. Further, the adaptive management process in the Los Angeles MS4 Order differs from the iterative process in that Permittees must carry out the adaptive management process every two years, limiting any discretionary determination as to when the program must be evaluated. (Los Angeles MS4 Order, Part VI.C.8.a.)

¹¹⁵ The numerical analysis methods and models approved for use by Permittees for estimating hydrologic conditions and contaminant fate and transport in the watersheds should, in principle, be able to propagate any and all known uncertainty to the outputs and results. It is in the public interest that the Los Angeles Water Board communicate this uncertainty to all stakeholders, as the results in most cases will affect the beneficial uses of California waters. Moreover, it is highly desirable that, to the extent possible, the Los Angeles Water Board define a minimum level of uncertainty (or level of confidence) acceptable for a reasonable assurance analysis to be approved.

achieve relevant water quality goals. . Currently, as stated above, the Permittees are required to implement the adaptive management process every two years from the date of program approval. Under the provision we add, the Permittees will be required to comprehensively update the reasonable assurance analysis (including potentially considering whether the model itself and its assumptions require updating) and the WMP/EWMP after several years of adaptive management, based on previous years' monitoring data and other performance measures. The Permittee will submit a full revised package to the Los Angeles Water Board Executive Officer for approval, following public review.

Given that the WMPs/EWMPs in many cases address water quality targets that are to be achieved a decade or more in the future, a periodic, complete re-consideration and recalibration of the assumptions and predictions that support the proposed control measures and implementation schedule in light of new data, above and beyond the two-year adaptive management requirements of the Los Angeles MS4 Order, is essential, notwithstanding the additional time and effort that Permittees must expend on the update. We also recognize that such review is a staff intensive process for the Los Angeles Water Board, but addressing storm water impacts is a priority for that Board. Although we expect that the update will be necessary in most cases, the new requirements provide that the Executive Officer of the Los Angeles Water Board may waive the requirement for an update if the Permittee demonstrates through water quality monitoring that the WMP/EWMP is meeting appropriate targets. Our direction to require a comprehensive update of the reasonable assurance analyses and the WMPs/EWMPs after several cycles of adaptive management should in no way be construed as limiting the Los Angeles Water Board Executive Officer's discretion to request such updates earlier in the implementation process or the obligation of the Permittees to initiate such updates earlier in the implementation process based on the ongoing adaptive management process.

The second added provision will not be relevant for the permit term of the order before us; however, we anticipate that the next iteration of an MS4 Order for the Los Angeles area will closely track the Los Angeles MS4 Order to allow for continued implementation of the WMP/EWMPs.

We shall amend Part VI.C.8 by adding new subsections a.iv. and b. as follows:

a.

iv. Permittees shall report the following information to the Regional Water Board concurrently with the reporting for the adaptive management process:

(1) On-the-ground structural control measures completed;

(2) Non-structural control measures completed;

- (3) Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;
- (4) Comparison of the effectiveness of the control measures to the results projected by the RAA;
- (5) Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the Watershed Management Program or EWMP;
- (6) Control measures proposed to be completed in the next two years pursuant to the Watershed Management Program or EWMP and the schedule for completion of those control measures;
- (7) Status of funding and implementation for control measures proposed to be completed in the next two years.

b. Watershed Management Program Resubmittal Process

- i. In addition to adapting the Watershed Management Program or EWMP every two years as described in Part VI.C.8.a., Permittees must submit an updated Watershed Management Program or EWMP with an updated Reasonable Assurance Analysis by June 30, 2021, or sooner as directed by the Regional Water Board Executive Officer or as deemed necessary by Permittees through the Adaptive Management Process, for review and approval by the Regional Water Board Executive Officer. The updated Reasonable Assurance Analysis must incorporate both water quality data and control measure performance data, and any other information informing the two-year adaptive management process, gathered through December 31, 2020. As appropriate, the Permittees must consider any new numeric analyses or other methods developed for the reasonable assurance analysis. The updated Watershed Management Program or EWMP must comply with all provisions in Part VI.C. The Regional Water Board Executive Officer will allow a 60-day public review and comment period with an option to request a hearing. The Regional Water Board Executive Officer must approve or disapprove the updated Watershed Management Program or EWMP by June 30, 2022. The Executive Officer may waive the requirement of this provision, following a 60-day public review and comment period, if a Permittee demonstrates through water quality monitoring data that the approved Watershed Management Program or EWMP is meeting appropriate water quality targets in accordance with established deadlines.

5. Determination of Compliance with Final Requirements

a. Compliance with Final TMDL Requirements¹¹⁶

Part VI.E.2.e.i.4. of the Los Angeles MS4 Order provides that Permittees will be deemed in compliance with the final WQBELs and other TMDL-specific limitations if “[i]n drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24 hour event is retained for the drainage area tributary to the applicable receiving water.”¹¹⁷ Part VI.E.2.e.i.4 is one of four options available to the Permittee in Part VI.E.2.e. to be deemed in compliance with WQBELs and other TMDL-specific limitations. The other three options allow a Permittee to establish compliance with a final WQBEL or other TMDL-specific limitation by showing that (1) there are no violations of the final WQBEL; (2) there are no exceedances of the receiving water limitation for the specific pollutant in the receiving water at or downstream of the Permittee’s outfall, or (3) there is no direct or indirect discharge from the Permittee’s MS4 to the receiving water during any relevant time period.¹¹⁸ These three options ensure that either the receiving water limitations or WQBELs and other TMDL-specific limitations are in fact being complied with. In contrast, the storm water retention approach assumes compliance with *final* WQBELs and other TMDL-specific limitations, and accordingly, compliance with the receiving water limitations in Part V for the relevant water body-pollutant combinations,¹¹⁹ even if the final WQBELs and other TMDL-specific limitations are not actually being achieved. The Environmental Petitioners argue that the Los Angeles Water Board has failed to establish through findings and record evidence that the storm water retention approach will in fact achieve compliance with the WQBELs and other TMDL-specific limitations and that the Los Angeles

¹¹⁶ The Los Angeles MS4 Order additionally deems compliance with *interim* WQBELs and other TMDL-specific limitations if the “Permittee has submitted and is fully implementing an approved” WMP/EWMP. (Los Angeles MS4 Order, Part VI.E.2.d.i.(4), p. 143; see also *id.*, Part VI.C.3.a., p. 53.) Because Permittees are required to incorporate into the WMP/EWMP compliance schedules “compliance deadlines occurring within the permit term for all applicable interim . . . water quality-based effluent limitations and/or receiving water limitations in Part VI.E and Attachments L through R,” we expect that in most cases full implementation of the WMP/EWMP necessarily results in compliance with interim WQBELs and other TMDL-specific limitations. However, to the extent this is not the result reached, we find that requiring implementation of the WMP/EWMP with control measures designed to achieve interim WQBELs and other TMDL-specific limitations, in lieu of showing actual compliance with any *interim* numeric requirements, is consistent with the assumptions and requirements of the wasteload allocations of the relevant TMDLs. (40 C.F.R. § 122.44(d)(1)(vii)(B).)

¹¹⁷ Los Angeles MS4 Order, Part VI.E.2.e.i.(4), p. 145.

¹¹⁸ *Id.*, Part VI.E.2.e.i.(1)-(3), pp. 144-45.

¹¹⁹ We note again that Part VI.E.2.c.i. states that Part VI.E establishes the manner of achieving compliance with the receiving water limitations in Part V.A where the receiving water limitations are associated with water body-pollutant combinations addressed in a TMDL.

MS4 Order's reliance on the storm water retention approach for final compliance determination is therefore contrary to the law.

We are supportive of the EWMP's use of the storm water retention approach as a technical requirement. Retention of storm water is likely to be an effective path to water quality improvement. Furthermore, in addition to preventing pollutants from reaching the receiving water except as a result of high precipitation events (which also generally result in significant dilution in the receiving water), the storm water retention approach has additional benefits including recharge of groundwater, increased water supply, reduced hydromodification effects, and creation of more green space to support recreation and habitat.¹²⁰

We have some concerns, however, with the lack of verification in the Los Angeles MS4 Order that final WQBELs and other TMDL-specific limitations or receiving water limitations will in fact be met as a result of implementation of the storm water retention approach. We acknowledge that, in most cases, the final TMDLs have deadlines outside of the permit term for the Los Angeles MS4 Order and that, therefore, with regard to those, our concerns are more theoretical at this point than immediate. Nevertheless, we agree with the Environmental Petitioners that the evidence in the Administrative Record is not sufficient to establish that the storm water retention approach will in all cases result in achievement of final WQBELs and other TMDL-specific limitations and, more importantly, are concerned that the Order itself does not incorporate clear requirements that would provide for such verification in the process of implementation.

With regard to evidence in the Administrative Record, it is clear that the storm water retention approach is a promising approach for achieving compliance with receiving water limitations, with multiple additional environmental benefits. But the research regarding the storm water retention approach is still in early stages and we cannot say with certainty at this point that implementation will lead to compliance with receiving water limitations in all cases.¹²¹

With that conclusion in mind, we look to the Los Angeles MS4 Order itself to determine if there are sufficient additional provisions to assure that, in the long run, the storm water retention approach will achieve the ultimate goal of compliance with receiving water limitations. We first note that the Order does not require a reasonable assurance analysis when

¹²⁰ See e.g. Administrative Record, section 10.VI.C, RB-AR29263-29311, RB-AR32318-32350.

¹²¹ We reviewed the citations to the Administrative Record provided in the Los Angeles Water Board October 15, 2013 Response and in the October 15, 2013 Responses of many of the Petitioners. We find that the cited studies show the storm water retention to be a promising approach to meeting water quality standards, but do not establish, at a sufficiently high level of confidence, that the storm water retention approach will definitively achieve compliance with the receiving water limitations.

a Permittee opts for the storm water retention approach. Permittees are required to conduct a reasonable assurance analysis for each water body-pollutant combination addressed by a WMP, with the objective of demonstrating the ability of the controls to ensure that MS4 discharges achieve applicable WQBELs and do not cause or contribute to exceedances of receiving water limitations.¹²² The relevant provisions reference EWMPs, but elsewhere the Order states that the reasonable assurance analysis is only required for areas covered by the EWMP where retention of the 85th percentile, 24-hour storm event is not feasible.¹²³ The Fact Sheet also implies that the requirement for a reasonable assurance analysis is confined to situations where the storm water retention approach is not feasible.¹²⁴ In sum, then, Permittees that choose to develop and implement an EWMP are required to conduct a reasonable assurance analysis for each waterbody-pollutant combination addressed by the EWMP, except in the drainage areas that are tributary to the storm water retention projects.

The fact that the storm water retention approach does not require a reasonable assurance analysis prior to implementation to demonstrate the ability of the approach to achieve compliance with the limitations is mitigated in part by required monitoring and adaptive management to verify compliance following implementation. Although the provision could be clearer, we read the language “[i]n drainage areas where Permittees are implementing an EWMP” in Part VI.E.2.e.i.(4) to require Permittees to be in compliance with all aspects of the EWMP, including the monitoring and adaptive management provisions of Parts VI.C.7 and 8, to be deemed in compliance with final limitations through the storm water retention approach. As we read the Order, a Permittee’s showing that it has retained all non-storm water and all storm water up to and including the volume equivalent to the 85th percentile, 24-hour event, establishes compliance, but only if the Permittee continues to conduct monitoring and adapt the EWMP in response to the monitoring. The Los Angeles Water Board appears to read the Order the way we do, as it states in its October 15, 2013 Response that “the Permit requires monitoring and adaptive management, which will continue to inform the Los Angeles Water Board regarding the efficacy of this storm water retention approach in conjunction with implementation of the other storm water management program elements and any needed

¹²² Los Angeles MS4 Order, Part VI.C.5.b.iv.(5), pp. 63-64.

¹²³ *Id.*, Part VI.C.1.g., p. 48.

¹²⁴ *Id.*, Att. F, Fact Sheet, p. F-39.

modifications to the approach.”¹²⁵ The Los Angeles Water Board further states in comments submitted on a draft of this order, as follows:

The Los Angeles MS4 Order does not exclude EWMPs or areas within an EWMP where the stormwater retention standard is achieved from the integrated watershed monitoring, assessment and adaptive management processes. Neither does the Los Angeles MS4 Order specify or contemplate an end to the monitoring, assessment and adaptive management processes in the case of a Watershed Management Program (WMP) or EWMP. These required elements, including receiving water and outfall monitoring, evaluation of these monitoring data, and modification of the EWMP to improve its effectiveness, will be continually conducted throughout the Watershed Management Area addressed by the EWMP. . . . The Los Angeles Water Board understood that these regional multi-benefit projects would take time to implement and that Permittees needed to be afforded this time in the Los Angeles MS4 Order. The Los Angeles Water Board will continually evaluate progress during the implementation period. If, as full implementation nears, some Receiving Water Limitations are still not achieved, the Los Angeles Water Board and State Water Board have a variety of tools that can be used at a regional or statewide level including reconsideration of TMDLs, Basin Planning actions, policy development and permitting, among others.¹²⁶

We will make a revision to Part VI.E.2.e.i. to make it clear that the Permittee must be in compliance with all other requirements of the EWMP in addition to implementation of the storm water retention approach in order to be deemed in compliance with the final WQBELs and other TMDL-specific limitations.

With no definitive evidence in the record establishing that the storm water retention approach will achieve final requirements, no reasonable assurance analysis required at the outset, and reliance only on subsequent monitoring and adaptive management to improve results if final limitations are not in fact achieved, the storm water retention approach does not provide a level of assurance of success that would lead us to conclude that its implementation, with nothing else, is sufficient to constitute compliance with final WQBELs and other TMDL-specific limitations. We understand that there are nevertheless very good reasons to encourage its use. Certainly for all non-storm water and for all storm water generated in storms up to the 85th percentile storm, the storm water retention approach achieves compliance because there is no discharge. And there are significant benefits beyond water quality, including most importantly benefits to water supply. We also believe that public projects requiring investment of this magnitude are unlikely to be carried out without a commitment from the water boards that Permittees will be considered in compliance even if the resulting improvement in water quality

¹²⁵ Los Angeles Water Board, October 15, 2013 Response, p. 62.

¹²⁶ Los Angeles Water Board, Comment Letter, January 21, 2015, pp. 2-3.

does not rise all the way to complete achievement of the final WQBELs and other TMDL-specific limitations.

We are not willing to go as far as saying that compliance with the storm water retention approach alone constitutes compliance with final WQBELs and other TMDL-specific limitations for all time, regardless of the actual results.¹²⁷ Nonetheless, we anticipate that implementation of such projects will bring the drainage area most and, in many cases, all of the way to achievement of water quality standards. Where there is still a gap in required water quality improvement, we expect the Executive Officer of the Los Angeles Water Board to require appropriate actions, consistent with the provisions of the Los Angeles MS4 Order and the Los Angeles Water Board's stated interpretation of those provisions,¹²⁸ to close that gap with additional control measures in order for the Permittee to be considered in compliance with the WQBEL or other TMDL-specific limitation. There are various mechanisms to provide assurances that additional control measures will be implemented to achieve the WQBEL or other TMDL-specific limitation, and in some instances, it may be appropriate for the Los Angeles Water Board to issue a time schedule order governing the implementation of further control measures. Further, as acknowledged by the Los Angeles Water Board in its comments, in some circumstances, reconsideration of the underlying TMDLs and the final deadlines within those TMDLs may instead be warranted.¹²⁹ We additionally recognize that municipal storm water management is an area of continued development and, with continued research and data evaluation, water quality standards may evolve and become more nuanced or sophisticated over time.

While we decline to interpret the storm water retention approach to, in and of itself, constitute compliance with final WQBELs and other TMDL-specific limitations, we emphasize here that any additional control measures to reach compliance that may be required by the Los Angeles Water Board must not require changes to installed storm water retention projects. Any revisions should be prospective in nature and should not disturb projects that Permittees have already installed in good faith to comply with the provisions of their EWMP.

¹²⁷ Further, Permittees still have substantial incentive to develop and implement an EWMP. If a permittee pursues an EWMP, it will be deemed in compliance with the receiving water limitations during the EWMP development phase, and it may also recognize significant non-water quality benefits.

¹²⁸ Los Angeles Water Board, Comment Letter, January 21, 2015, pp. 2-3. As explained in footnote 110, at this time we see limited options available to the Los Angeles Water Board in addressing compliance with final deadlines for WQBELs and other TMDL-specific limitations.

¹²⁹ We also acknowledge the need for and commit to supporting state-wide solutions for source reduction as appropriate, similar to the brake pad legislation adopted to address copper discharges. (Senate Bill 346 (approved by the Governor September 27, 2010).)

Ultimately, we must set out to verify through appropriate monitoring that final WQBELs and other TMDL-specific limitations can be achieved through the storm water retention approach, or be willing to revise that approach. However, new or additional measures required at that point should be additive to the storm water retention approach measures already installed.

In sum, despite the uncertainty inherent in allowing the storm water retention approach, we concur in its use in the Los Angeles MS4 Order, with the clarification that ultimate compliance is subject to continued planning, monitoring and adaptive management. We shall amend Part VI.E.2.e.i. as follows:

- i. A Permittee shall be deemed in compliance with an applicable final water quality-based effluent limitation and final receiving water limitation for the pollutant(s) associated with a specific TMDL if any of the following is demonstrated:

...

- (4) In drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24 hour event is retained for the drainage area tributary to the applicable receiving water, **and the Permittee is implementing all requirements of the EWMP, including, but not limited to, Parts VI.C.7 and VI.C.8 of this Order.** This provision (4) shall not apply to final trash WQBELs.

b. Compliance with Final Receiving Water Limitations

The Los Angeles MS4 Order states that for receiving water limitations associated with water-body pollutant combinations addressed in a TMDL, compliance with the TMDL requirements of the Order in Part VI.E and Attachments L through R constitutes compliance with the receiving water limitations in Part V.A.¹³⁰ In other words, if there is an exceedance for a pollutant in a water body that has a TMDL addressing that pollutant, as long as the Permittee is complying with the requirements for the TMDL, the Permittee is deemed in compliance with the receiving water limitation. No petitioner has contested this provision and we find that it constitutes an appropriate approach to compliance with receiving water limitations for water body-pollutant combinations that are addressed by a TMDL.

For exceedances of receiving water limitations for a water body-pollutant combination not addressed by a TMDL, as previously discussed, the Permittee must either incorporate control measures to address the exceedances into the Permittee's WMP/EWMP or comply directly with the receiving water limitations provisions of Part V.A of the Order. For

¹³⁰ Los Angeles MS4 Order, Part VI.E.2.c.ii., p. 143.

Permittees that choose the WMP/EWMP approach, the WMP/EWMP must incorporate “a final date for achieving the receiving water limitation.”¹³¹ To the extent the Permittee does not achieve the limitation by that final date and does not request and receive an extension, the Permittee has “fail[ed] to meet [a] requirement or date for its achievement in an approved Watershed Management Program or EWMP”¹³² and is immediately subject to the receiving water limitations provisions of the Order, with the same result that it is out of compliance. In other words, implementation of non-structural and structural control measures in accordance with the timelines established in the WMP/EWMP constitutes compliance with the receiving water limitations up until the final deadline for achievement of the relevant receiving water limitation; however, at the deadline for final compliance, there must be verification of achievement based on the receiving water limitation itself. While we find that the Order provisions lead to this result as written, for the sake of greater clarity, we will specifically state that final compliance with receiving water limitations must be determined through verification that the receiving water limitation is actually being achieved.

We shall amend Part VI.C.2.c. as follows:

- c. If a Permittee fails to meet any requirement or date for its achievement in an approved Watershed Management Program or EWMP, the Permittee shall be subject to the provisions of Part V.A. for the waterbody-pollutant combination(s) that were to be addressed by the requirement. **For water body-pollutant combinations that are not addressed by a TMDL, final compliance with receiving water limitations is determined by verification through monitoring that the receiving water limitation provisions in Part V.A.1 and 2 have been achieved.**

c. Compliance with the Non-Storm Water Discharge Prohibition

The Environmental Petitioners suggest that the Los Angeles MS4 Order is unclear as to whether compliance with the WMP/EWMP may also constitute compliance with the non-storm water discharge prohibition of the Order. We disagree that the Los Angeles MS4 Order is unclear on this issue. The Permittees’ obligation to comply with the receiving water limitations and WQBELs and other TMDL-specific limitations in Parts V.A and VI.E is independent of the Permittees’ obligation to comply with the effective prohibition of non-storm water discharges in Part III.A. The several provisions stating that Permittees will be deemed to be in compliance with the receiving water limitations of the Los Angeles MS4 Order for implementing the WMP/EWMP specifically reference Parts V.A and VI.E of the Order and not

¹³¹ *Id.*, Part VI.C.5.c.iii.(3)(b), p. 65.

¹³² *Id.*, Part VI.C.2.c., p. 52.

III.A.¹³³ This notwithstanding, Parts VI.C.1.d and VI.C.5.b.iv.(2) require that a Permittee's WMP/EWMP include program elements and control measures to effectively prohibit non-storm water discharges consistent with Part III.A and Part VI.D.4.d or VI.D.10. Therefore, a Permittee's implementation of program elements and control measures consistent with Part III.A and Part VI.D.4.d or VI.D.10, through its approved WMP/EWMP, may provide a mechanism for compliance with Part III.A. Although we accordingly see no need to direct revisions to the Order, we provide this clarification here to respond to the Environmental Petitioners' concern and address any confusion that may exist.

6. "Safe Harbor" During the Planning Phase for the WMP/EWMP

Under the Los Angeles MS4 Order, a Permittee that has declared its intention to develop a WMP/EWMP is deemed in compliance with the receiving water limitations and with interim WQBELs with due dates prior to approval of the WMP/EWMP for the water body-pollutant combinations the WMP/EWMP addresses, provided it meets certain conditions, even though the Permittee is developing, not implementing the WMP/EWMP. Specifically, the Permittee is deemed in compliance if the Permittee (1) provides timely notice of its intent to develop a WMP/EWMP; (2) meets all interim and final deadlines for development of a WMP/EWMP; (3) targets implementation of watershed control measures in the existing program

¹³³ Los Angeles MS4 Order, Parts VI.C.2.b., p. 52, VI.C.3.a., p. 53, VI.E.2.c.ii., p. 143, VI.C. 2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144. To the extent that a non-storm water discharge authorized by Part III.A may be causing or contributing to an exceedance of receiving water limitations in V.A, compliance with the WMP/EWMP provisions would constitute compliance with the receiving water limitations and any relevant interim WQBELs and other TMDL-specific limitations, as long as the WMP/EWMP addresses the water body-pollutant combination for that water body. However, the discharger would have to additionally comply with requirements in Part III.A. and Part VI.D.4.d or VI.D.10 through its approved WMP/EWMP for conditionally exempt non-storm water discharges that are found to cause or contribute to an exceedance in the receiving water. (See *id.*, Part III.A.4.c.-e., pp. 31-32.) We disagree that every discharge from a Permittee's MS4 to the receiving water of non-storm water that is not specifically authorized under Part III.A will necessarily be subject to enforcement under the Los Angeles MS4 Order. Section 402(p)(3)(B)(ii) of the Clean Water Act imposes a requirement to "effectively prohibit" non-storm water discharges. Part III.A of the Los Angeles MS4 Order effectuates that requirement with a requirement for the Permittee to prohibit non-storm water discharges: "Each Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters, except where such discharges are . . . [listing exceptions]." (Los Angeles MS4 Order, Part III.A.1, p. 27.) The Los Angeles MS4 Order incorporates a specific and detailed programmatic requirement – the Illicit Connections and Illicit Discharges Elimination Program – for the Permittees to achieve their obligation to effectively prohibit non-storm water discharges. (Los Angeles MS4 Order, Parts VI.D.4.d., pp. 81-86, VI.D.10, pp. 137-141.) We recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges. Where a Permittee is fully implementing its Illicit Connections and Illicit Discharges Elimination Program, either pursuant to Parts VI.D.4.d. or VI.D.10, or by incorporation of customized actions into a WMP/EWMP as approved by the Los Angeles Water Board (see Los Angeles MS4 Order Part VI.D.1.a., p. 67), we would expect any enforcement action under Part III.A to be supported by a fact-specific analysis of the nature and source of the unauthorized non-storm water discharge and the efforts of the Permittee to prohibit the discharge.

to address known contributions of pollutants; and (4) receives approval of the WMP/EWMP within the specified time periods.¹³⁴

The Environmental Petitioners object to the availability of a “safe harbor” during the planning phase. We disagree with the Environmental Petitioners that providing a “safe harbor” in the planning phase is disallowed by applicable law -- see our discussion of anti-backsliding requirements in section II.B.1. and antidegradation requirements in section II.B.2. However, we understand that deeming a discharger in compliance with receiving water limitations during the planning phase, not just the implementation phase, could weaken the incentive for Permittees to efficiently and timely seek approval of a WMP/EWMP and to move on to implementation. It is the implementation of the WMP/EWMP that will in fact lead to progress toward compliance with receiving water limitations; the planning phase is essential, but should be only as long as necessary for a well-planned program with carefully analyzed controls to be developed. Given the significance of the water quality issues addressed by the WMP/EWMPs, it is paramount that implementation begin as soon as feasible. Accordingly, the “safe harbor” in the planning phase is appropriate only if it is clearly constrained in a manner that sustains incentives to move on to approval and implementation and is structured with clear, enforceable provisions.

Having reviewed the planning sections of the WMP/EWMP provisions carefully, we find that the Los Angeles MS4 Order does sufficiently constrain the planning phase, so that the “safe harbor” provided is not unreasonable. As already stated, compliance is deemed only if the Permittee is meeting the relevant deadlines for development and approval of the WMP/EWMP.¹³⁵ There are no provisions in the Order that allow for extensions to these deadlines. If a Permittee fails to obtain approval within the allowed number of months for the development of a WMP/EWMP, the Order states that the Permittee must then instead demonstrate actual compliance with receiving water limitations and with applicable interim WQBELs.¹³⁶ The Los Angeles MS4 Order is also clear that achievement of any TMDL-associated final deadlines occurring prior to the approval deadlines for the WMP/EWMP cannot be excused through commitment to planning for a WMP/EWMP.¹³⁷

¹³⁴ *Id.*, Parts VI.C.2.d., p. 52, VI.C.3.b., p. 53, VI.E.2.d.i.(4)(d), p. 144.

¹³⁵ *Id.*, Parts VI.C.2.d., p. 52, VI.C.3.b., p. 53, VI.E.2.d.i.(4)(d), p. 144.

¹³⁶ *Id.*, Part VI.C.4.e., p. 58.

¹³⁷ *Id.*, Parts VI.C.3.c., p. 53, VI.C.4.d.iii, p. 58. Under Part VI.C.4.d.iii., Permittees must ensure that MS4 discharges achieve compliance with interim, in addition to final, trash WQBELs during the planning phase.

Further, Permittees are subject to a number of conditions during the planning phase that will ensure that progress toward achievement of receiving water limitations is not put on hold pending approval of the plan. These include requirements to put in place Low Impact Development (LID) ordinances and green streets policies¹³⁸ and to continue to implement watershed control measures in the existing storm water management programs, including those to eliminate non-storm water discharges,¹³⁹ but in a manner that is targeted to address known pollutants.¹⁴⁰

Given the clear, enforceable requirements limiting the planning phase of the WMP/EWMP provisions, we find that the Los Angeles MS4 Order's inclusion of provisions deeming compliance with the receiving water limitations and with interim WQBELs during development of the programs is reasonable.

In fact, we are concerned that the Los Angeles Water Board has left no room for any deviation from the prescribed development schedule for WMP/EWMPs. A Permittee working in good faith to develop a WMP/EWMP over multiple months may encounter an issue that requires it to ask for a short extension on an interim or final deadline. Under such circumstances, the Los Angeles Water Board should be able to consider the request for the extension, rather than have its hands tied and have to reject a WMP/EWMP based on lack of timeliness. We will add a provision to the Order that provides the Los Angeles Water Board or its Executive Officer discretion in granting such extensions, but the Permittee will not be deemed in compliance with the applicable receiving water limitations and WQBELs during the period of the extension.

We shall add a new Part VI.C.4.g. as follows:

g. Permittees may request an extension of the deadlines for notification of intent to develop a Watershed Management Program or EWMP, submission of a draft plan, and submission of a final plan. The extension is subject to approval by the Regional Water Board or the Executive Officer. Permittees that are granted an extension for any deadlines for development of the WMP/EWMP shall be subject to the baseline requirements in Part VI.D and shall demonstrate compliance with receiving water limitations pursuant to Part V.A. and with applicable interim water quality-based effluent limitations in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3) until the Permittee has an approved WMP/EWMP in place.

¹³⁸ *Id.*, Part VI.C.4.c., pp. 56-57.

¹³⁹ *Id.*, Part VI.C.4.d.i.-ii., pp. 57-58.

¹⁴⁰ *Id.*, Parts VI.C.2.d.iii., pp. 52-53, VI.C.3.b.iii., p. 53, VI.E.2.d.i.(4)(d)(3), p. 144.

7. Conclusion

In conclusion, we uphold the WMP/EWMP provisions as a reasonable alternative compliance option for meeting receiving water limitations and uphold the WMP/EWMP provisions in all other aspects, except as specifically stated above. We find that the WMP/EWMP approach is a clearly defined, implementable, and enforceable alternative to the receiving water limitations provisions that we mandated in Order WQ 99-05, and that the alternative provides Permittees an ambitious, yet achievable, path forward for steady and efficient progress toward achievement of those limitations while remaining in compliance with the terms of the permit.

We direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward.¹⁴¹ In doing so, we acknowledge that regional differences may dictate a variation on the WMP/EWMP approach, but believe that such variations must nevertheless be guided by a few principles.¹⁴² We expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.

1. The receiving water limitations provisions of Phase I MS4 permits should continue to require compliance with water quality standards in the receiving water and should not deem good faith engagement in the iterative process to constitute such compliance. The Phase I MS4 permits should therefore continue to use the receiving water limitations provisions as directed by State Water Board Order WQ 99-05.

¹⁴¹ We acknowledge that small MS4s permitted under the statewide General Permit for WDRs for Storm Water Discharges from Small MS4s (Order No. 2013-0001-DWQ) (General Phase II MS4 Permit) have similar practical issues as Phase I permittees in complying with receiving water limitations. Nevertheless, because the General Phase II MS4 Permit is issued by the State Water Board, not the regional water boards, we limit our guidance to regional water boards to the Phase I permits. The State Water Board is committed to working with small MS4s, the regional water boards, and interested persons in developing an alternative compliance option for the General Phase II MS4 Permit.

¹⁴² In considering appropriate guidance for regional water boards drafting alternative compliance paths in municipal storm water permits, we have reviewed the proposed "strategic compliance program" model language that was submitted by the California Stormwater Quality Association (CASQA) and supported in whole or in part by a number of interested persons. (CASQA August 15, 2013 Receiving Water Limitations Submission, Attachment A, Section E.) While we have not in these proceedings adopted the CASQA language, or, for that matter, any specific language, for alternative compliance path provisions, regional water boards remain free to consider and incorporate the CASQA approach into their municipal storm water permits to the extent they determine and document that the approach, including any modifications, satisfies the principles we set out in this section as well as all other direction we have provided in this order.

2. The Phase I MS4 permits should include a provision stating that, for water body-pollutant combinations with a TMDL, full compliance with the requirements of the TMDL constitutes compliance with the receiving water limitations for that water body-pollutant combination.
3. The Phase I MS4 permits should incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative.
4. The alternative compliance path should encourage watershed-based approaches, address multiple contaminants, and incorporate TMDL requirements.
5. The alternative compliance path should encourage the use of green infrastructure and the adoption of low impact development principles.
6. The alternative compliance path should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.
7. The alternative compliance path should have rigor and accountability. Permittees should be required, through a transparent process, to show that they have analyzed the water quality issues in the watershed, prioritized those issues, and proposed appropriate solutions. Permittees should be further required, again through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. Permittees should be required to conduct this type of adaptive management on their own initiative without waiting for direction from the regional water board.

8. Direction to the Los Angeles Water Board to Report to the State Water Board on Implementation

We recognize that our review has been limited to the provisions of the Los Angeles MS4 Order. The success of the WMP/EWMP approach depends in large part on the steps that follow adoption of these provisions, i.e., the effort invested by Permittees in developing WMPs/EWMPs that truly address the stringent provisions of the Order, the precision with which the Los Angeles Water Board reviews the draft programs and requires revisions, and, most importantly, the actual implementation and appropriate enforcement of the programs once approved. The work going forward must ensure that the WMPs/EWMPs in fact exhibit the rigor and accountability the provisions of the Los Angeles MS4 Order demand. We expect that the Los Angeles Water Board will make careful oversight and enforcement a priority and that they will be aided in this process by the public review and comment opportunities built into the terms of the Order.

The process of developing the WMPs/EWMPs is currently ongoing -- the Los Angeles Water Board has been reviewing draft and revised draft WMPs and workplans for EWMPs – and, although we have been asked by the Environmental Petitioners to take official notice of some of the submissions and conditional approvals in the process, it is premature for the State Water Board to speak to the sufficiency of the resulting WMPs/EWMPs until the Los Angeles Water Board, with full input from the stakeholders, has had the opportunity to consider, revise, and finally approve the programs. We note again that all documents submitted to the Los Angeles Water Board Executive Officer for approval are subject to a 30-day public comment period¹⁴³ and that any formal determination or approval by the Executive Officer may be reviewed by the Los Angeles Water Board upon request by an interested person.¹⁴⁴ And an interested person may petition the State Water Board to review an action or failure to act of the Los Angeles Water Board.¹⁴⁵

Once the WMPs/EWMPs are approved, ensuring that they are diligently and timely implemented must remain a top priority for the Los Angeles Water Board. We expect that the Los Angeles Water Board will continue to work cooperatively and closely with the Permittees, the Environmental Petitioners, and other interested persons in this process, but that the Board will also use its enforcement authority to ensure that appropriate progress is made toward water quality goals. We intend to remain involved in this process, as we must learn statewide from the successes and shortcomings of the approach we are endorsing with this order. We accordingly direct the Los Angeles Water Board to report to us on progress in implementation of the WMPs/EWMPs, and progress in improving water quality during this and the next permit term by February 28, 2018, by February 29, 2020, and by March 31, 2022. Specifically, we ask that the Los Angeles Water Board report on region-wide data for the following:

- On-the-ground structural control measures completed;
- Non-structural control measures completed;
- Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;

¹⁴³ Los Angeles MS4 Order, Part V.A.5.b, p. 42.

¹⁴⁴ *Id.*, Part V.A.6, p. 42.

¹⁴⁵ Wat. Code, § 13320. On April 28, 2015, the Executive Officer of the Los Angeles Water Board conditionally approved several submitted WMPs. On May 28, 2015, the Environmental Petitioners filed a petition challenging the conditional approvals and requesting review by the Los Angeles Water Board and by the State Water Board of the Executive Officer's determination.

- Comparison of the effectiveness of the control measures to the results projected by the reasonable assurance analyses;
- Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the WMPs/EWMPs;
- Control measures proposed to be completed in the next two years pursuant to the WMPs/EWMPs and the schedule for completion of those control measures;
- Status of funding and implementation for control measures proposed to be completed in the next two years;
- Trends in receiving water quality related to pollutants typically associated with storm water;
- Available permit compliance data, including requests for compliance extensions;
- Enforcement actions taken and results.

In addition to covering the above information, the third report shall summarize and reflect the comprehensive information gathered through the updates of the reasonable assurance analyses and WMPs/EWMPs conducted by the Permittees in the second permit term.

C. Appropriateness of TMDL Requirements

Section 303(d) of the Clean Water Act requires the water boards to identify impaired water bodies that do not meet water quality standards after applying required technology-based effluent limitations.¹⁴⁶ TMDLs are developed by either the regional water boards or by USEPA in response to section 303(d) listings of impaired water bodies. A TMDL is defined as the sum of the individual wasteload allocations for point sources of pollution, the load allocations for nonpoint sources of pollution, and the contribution from background sources of pollution,¹⁴⁷ and represents the maximum amount of a pollutant that a water body may receive and still achieve water quality standards. TMDLs developed by regional water boards include implementation provisions¹⁴⁸ and are typically incorporated into the regional water board's water quality control plan.¹⁴⁹ TMDLs developed by USEPA typically contain the total load and load allocations required by section 303(d), but do not set out comprehensive implementation provisions.¹⁵⁰ Most TMDLs are not self-executing, but instead rely upon subsequently-issued permits to impose requirements on discharges that implement the TMDLs' wasteload

¹⁴⁶ 33 U.S.C. § 1313(d).

¹⁴⁷ 40 C.F.R. § 130.2(i).

¹⁴⁸ Wat. Code, §§ 13050, subd. (j), 13242.

¹⁴⁹ See 40 C.F.R. §§ 130.6(c)(1).

¹⁵⁰ *Am. Farm Bureau Fed'n v. U.S. E.P.A.* (M.D. Pa. 2013) 984 F. Supp. 2d 289, 314.

allocations.¹⁵¹ The Los Angeles MS4 Order includes TMDL-specific requirements that implement 33 TMDLs (twenty-five adopted by the Los Angeles Water Board, seven established by USEPA, and one adopted by the Santa Ana Regional Water Quality Control Board that assigned requirements to two Permittees of the Los Angeles MS4 Order) in Part VI.E and in Attachments L-R.

Petitioners raise a number of challenges to the TMDL-based requirements of the Los Angeles MS4 Order. We take up several of those arguments in this section.¹⁵²

1. Inclusion of Numeric WQBELs

Permittee Petitioners argue that the numeric WQBELs incorporated into the Los Angeles MS4 Order as TMDL-based limitations are contrary to the Clean Water Act and to state law and policy. We disagree.

Under the federal regulations implementing the Clean Water Act, effluent limitations in NPDES permits developed to achieve water quality standards must be consistent with the assumptions and requirements of any available wasteload allocation for the discharge.¹⁵³ In addition, the Porter-Cologne Act requires that waste discharge requirements implement any relevant water quality control plans,¹⁵⁴ including TMDL requirements that have been incorporated into the water quality control plans. The Los Angeles MS4 Order incorporates numeric WQBELs and other limitations that the Los Angeles Water Board found are consistent with the TMDL requirements applicable to the Permittees.

Permittee Petitioners argue that there is no requirement under federal law for incorporation of TMDL requirements into an MS4 permit and that the inclusion of the requirements in Part VI.E and in Attachments L-R was therefore at the discretion of the Los Angeles Water Board. They point out, as we acknowledged in section II.A, that MS4 discharges must meet a technology-based standard of prohibiting non-storm water discharges and reducing pollutants in the discharge to the MEP, but that requirements to strictly meet water quality standards are at the discretion of the permitting agency.¹⁵⁵ Because TMDL requirements are a path to achieving water quality standards, the Permittee Petitioners argue, the Los Angeles Water Board had the discretion not to include them in the Los Angeles MS4 Order.

¹⁵¹ *City of Arcadia v. EPA* (N.D. Cal. 2013) 265 F.Supp.2d 1142, 1144-1145.

¹⁵² We note that we do not take up any arguments that challenge the terms of the TMDLs. Those arguments should have been made during the public process when the TMDLs were adopted. They are untimely now.

¹⁵³ 40 C.F.R. § 122.44(d)(1)(vii)(B).

¹⁵⁴ Wat. Code, § 13263, subd. (a).

¹⁵⁵ 33 U.S.C. § 1342(p); *Defenders of Wildlife, supra*, 191 F.3d 1159.

Answering the question of whether the Los Angeles Water Board was required under federal law to strictly effectuate TMDL compliance through the Los Angeles MS4 Order is a largely irrelevant exercise because we have already reaffirmed in this order that we will continue to require water quality standards compliance in MS4 permits. Further, given the back-stop nature of TMDLs, and the fact that each set of dischargers must meet their share of the allocation to reach the total reductions set out, a regime in which municipal storm water dischargers were given a pass on TMDL obligations would render the promise of water quality standards achievement through TMDLs illusory. This is especially true in a large urbanized area where pollutants in storm water constitute a significant share of the impairment and where other dischargers would be disproportionately burdened if MS4s were not held to their allocations. Although not dispositive, we also note that USEPA has assumed in guidance (discussed in more detail below) issued on storm water and TMDL implementation that MS4 permits must incorporate effluent limitations consistent with the assumptions and requirements of relevant wasteload allocations.¹⁵⁶ To the extent the TMDL provisions of the Clean Water Act and the federal regulations could be read to preclude mandatory incorporation of wasteload allocations into an MS4 permit, effluent limitations consistent with those load allocations should nevertheless be required under Clean Water Act section 402, subsection (p)'s direction that the MS4 permit shall require "such other controls" as the permitting authority determines "appropriate for the control of such pollutants."¹⁵⁷ Finally, for TMDLs incorporated into water quality control plans, the implementation plan associated with the TMDL applies to all dischargers named, including MS4 permittees, and the MS4 permits must be consistent with the direction in the water quality control plan.¹⁵⁸

Having found that the Los Angeles Water Board acted in a manner consistent with federal and state law when it developed WQBELs to address applicable TMDLs, we next turn to whether *numeric* WQBELs were appropriate. We find that the Los Angeles Water Board

¹⁵⁶ USEPA, Memorandum, "Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," (Nov. 22, 2002) (2002 USEPA Memorandum); see also USEPA, Memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,'" (Nov. 26, 2014) (2014 USEPA Memorandum). The 2014 USEPA Memorandum replaced a memorandum with the same title issued on November 12, 2010, which was subsequently opened to public comment. (USEPA Statement (March 17, 2011), available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_tmdlwla_comments.pdf> (as of Nov. 18, 2014).)

¹⁵⁷ 33 U.S.C. § 1342(p)(3)(B)(iii). See, e.g., State Water Board Orders WQ 91-03, WQ 91-04, WQ 98-01, WQ 99-05, WQ 2001-15.

¹⁵⁸ Wat. Code, § 13263, subd. (a); see also *State Water Res. Control Bd. Cases* (2006) 136 Cal. App. 4th 674, 730 (noting the obligation of the water boards to follow the program of implementation included in a water quality control plan).

acted within its legal authority when establishing numeric WQBELs, and further that its choice of numeric WQBELs was a reasonable exercise of its policy discretion.

In the context of MS4 discharges, effluent limitations in NPDES permits may be expressed in the form of either numeric limitations or best management practices (BMPs). The federal regulations specifically state that BMP-based effluent limitations may be used to control pollutants for storm water discharges.¹⁵⁹ USEPA has issued two memoranda, on November 22, 2002 (2002 USEPA Memorandum), and on November 26, 2014 (2014 USEPA Memorandum), providing guidance to the states on translating wasteload allocations for storm water into effluent limitations in NPDES Permits.¹⁶⁰ The 2002 USEPA Memorandum contemplated that “the NPDES permitting authority will review the information provided by the TMDL . . . and determine whether the effluent limit is appropriately expressed using a BMP approach (including an iterative BMP approach) or a numeric limit.”¹⁶¹ The 2002 USEPA Memorandum further stated that “EPA expects that most WQBELs for NPDES-regulated municipal . . . storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances.”¹⁶² The 2014 USEPA Memorandum, after noting the increased information available to the permitting agencies after more than a decade of experience with setting wasteload allocations and effluent limitations, explained that:

Where the TMDL includes WLAs for stormwater sources that provide numeric pollutant loads, the WLA should, where feasible, be translated into effective, measurable WQBELs that will achieve this objective. This could take the form of a numeric limit, or of a measurable, objective BMP-based limit that is projected to achieve the WLA. . . . The permitting authority’s decision as to how to express the WQBEL(s), either as numeric effluent limitations or as BMPs, with clear, specific, and measurable elements, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying

¹⁵⁹ 40 C.F.R. § 122.44(k)(2); see also 33 U.S.C. § 1342(p)(3)(B)(iii). 40 Code of Federal Regulations section 122.44(k)(3) further contemplates that BMP-based effluent limitations are appropriate where it is infeasible to develop a numeric effluent limitation.

¹⁶⁰ 2002 USEPA Memorandum; 2014 USEPA Memorandum. In addition to the two memoranda, USEPA published guidance titled “Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits” ((Sept. 1996) 61 Federal Register 57425), which recommended inclusion of BMPs in first-round permits, and expanded or better-tailored BMPs in subsequent permits. In 2005, the State Water Board assembled a blue ribbon panel to address the feasibility of including numeric effluent limits as part of NPDES municipal, industrial, and construction storm water permits. The panel issued a report dated June 19, 2006, which included recommendations as to the feasibility of including numeric limitations in storm water permits. The report concluded that it was not feasible, at that time, to set enforceable numeric effluent limitations for municipal storm water discharges.

¹⁶¹ 2002 USEPA Memorandum, p. 5.

¹⁶² *Id.*, p. 2.

WLA, including the nature of the stormwater discharge, available data, modeling results, and other relevant information.¹⁶³

Both options – to choose BMP-based WQBELs or to choose numeric WQBELs – were legally available to the Los Angeles Water Board. In adopting numeric WQBELs, the Los Angeles Water Board analyzed the specific facts and circumstances surrounding storm water discharges in the region and reasonably concluded that numeric WQBELs were warranted because storm water discharges constituted a significant contributor to the water quality standards exceedances in the area and the exceedances had not been to date resolved through BMP-based requirements. Moreover, the Los Angeles Water Board concluded that it could feasibly develop numeric WQBELs following the extensive work already conducted to develop the TMDLs, which involved analyzing pollutant sources and allocating loads using empirical relationships or quantitative models. We will not second-guess the determination of the Los Angeles Water Board, given its extensive and unique role in developing the TMDLs and the permit to implement the TMDLs, that numeric WQBELs were appropriate for the Los Angeles MS4 Order.¹⁶⁴

We emphasize, however, that we are not taking the position that numeric WQBELs are appropriate in all MS4 permits or even with respect to certain TMDLs within an MS4 permit. In a recent amendment to State Water Board Order 2011-0011-DWQ, NPDES Statewide Storm Water Permit for State of California Department of Transportation (Caltrans),¹⁶⁵ we found BMP-based TMDL requirements to be “consistent with the assumptions and requirements of the WLAs” of the TMDLs applicable to Caltrans. That determination was based on a number of factors including the fact that Caltrans, a single discharger, was named in over 80 TMDLs statewide, the fact that Caltrans had relatively little contribution to the exceedances in each of those TMDLs, and the consideration that there was significant efficiency to be gained by streamlining and standardizing control measure implementation throughout Caltrans’ statewide storm water program. Similarly, regional water boards may find BMP-based requirements to be appropriate based on TMDL-specific, region-specific, or permittee-specific

¹⁶³ 2014 USEPA Memorandum, p. 6.

¹⁶⁴ The Los Angeles Water Board incorporated a discussion in the Fact Sheet of how the TMDL wasteload allocations were translated into numeric WQBELs in order to implement the TMDLs in the Los Angeles MS4 Order. (Los Angeles MS4 Order, Att.F, Fact Sheet, pp. F-89-F-100). See 40 C.F.R. § 124.8. We are not independently reviewing the calculations and analyses underlying the specific numeric limitations arrived at by the Los Angeles Water Board; rather, our review has been limited to a determination of whether the choice of numeric rather than BMP-based limitations was reasonable. To the extent any petitioners asked us to independently review the issue in their petitions seeking review of the Order, the issue is dismissed. See fn. 11.

¹⁶⁵ State Water Board Order WQ 2014-0077-DWQ.

considerations. In many ways, the Los Angeles MS4 Order was uniquely positioned to incorporate numeric WQBELs because of the extensive TMDL development in the region in the past decade and the documented role of MS4 discharges in contributing to the impairments addressed by those TMDLs. Thus, while we decline to remove the numeric WQBELs from the Los Angeles MS4 Order, we also decline to urge the regional water boards to use numeric WQBELs in all MS4 permits.¹⁶⁶

2. Requirement for Reasonable Potential Analysis

The federal regulations implementing NPDES permitting require the permitting authority to establish WQBELs for point source discharges when those discharges cause, have the “reasonable potential” to cause, or contribute to an excursion above water quality standards.¹⁶⁷ Permittee Petitioners argue that the Los Angeles Water Board did not conduct an appropriate reasonable potential analysis prior to imposing numeric WQBELs. The argument is misguided. The Los Angeles Water Board established that the MS4 discharges can cause or contribute to exceedances of water quality standards through the process of developing TMDLs and assigning wasteload allocations. At the permitting stage, the Los Angeles Water Board’s legal obligation was to develop WQBELs “consistent with the assumptions and requirements of any wasteload allocation” in the TMDLs,¹⁶⁸ and not to reconsider reasonable potential.¹⁶⁹

3. USEPA-Established TMDLs

USEPA has established seven TMDLs that include wasteload allocations for MS4 discharges covered by the Los Angeles MS4 Order. In contrast to state-adopted TMDLs, USEPA-established TMDLs do not contain an implementation plan or schedule for achievement of the wasteload allocations,¹⁷⁰ with the effect that Permittees must comply with wasteload allocations immediately. To avoid this result, the regional water board may either adopt a

¹⁶⁶ Relying on the 2014 USEPA Memorandum, Permittee Petitioners also argue that the Los Angeles Water Board was required to disaggregate storm water sources within applicable TMDLs. The 2014 USEPA Memorandum only encourages permit writers to assign specific shares of the wasteload allocation to specific permittees during the permitting process, reasoning that permit writers may have more detailed information than the TMDL writers to assign reductions for specific sources. (2014 USEPA Memorandum, p.8.) In an MS4 system as complex and interconnected as that covered under the Los Angeles MS4 Order, we do not expect the permitting authority to be able to disaggregate wasteload allocations by discharger. Further, as discussed in section II.F. on joint responsibility, the Los Angeles MS4 Order has provided a means for Permittees with commingled discharges to demonstrate that they are not responsible for any given exceedance of a limitation.

¹⁶⁷ 40 C.F.R. § 122.44(d)(1)(iii).

¹⁶⁸ 40 C.F.R. § 122.44(d)(1)(vii)(B).

¹⁶⁹ See USEPA, NPDES Permit Writers Manual (updated September 2010), Chapter 6, section 6.3.3.

¹⁷⁰ See, e.g., *Am. Farm Bureau Fed'n v. U.S. E.P.A.*, *supra*, 984 F. Supp. 2d at p. 314.

separate implementation plan as a water quality control plan amendment¹⁷¹ or issue the Permittee a compliance order with a compliance schedule.¹⁷² For the seven USEPA-established TMDLs applicable to the Permittees, the Los Angeles Water Board authorizes Permittees subject to a wasteload allocation in a USEPA-established TMDL to propose control measures that will be effective in meeting the wasteload allocation, and a schedule for their implementation that is as short as possible, as part of a WMP/EWMP.¹⁷³ Permittees that do not submit an adequate WMP/EWMP are required to demonstrate compliance with the wasteload allocations immediately.¹⁷⁴

Permittee Petitioners argue that the Los Angeles Water Board has acted inconsistently in requiring BMP-based compliance with the USEPA-established TMDLs but requiring numeric WQBELs for the state-established TMDLs. We have already stated above in section C.1 that the permitting authority has discretion to choose between BMP-based and numeric effluent limitations depending on fact-specific considerations. The Los Angeles Water Board was not restricted to choosing one single uniform approach to implementing all 33 TMDLs in the Los Angeles MS4 Order. In fact, straight-jacketing NPDES permit writers to choose one approach to the exclusion of another, even within the confines of a single MS4 permit, would run afoul of USEPA's expectations in the 2014 USEPA Memorandum for a fact-specific, documented justification for the permit requirements included to implement a wasteload allocation.

The Environmental Petitioners argue that the provisions are contrary to law because they excuse Permittees from complying with final numeric wasteload allocations as long as they are implementing the BMPs proposed in the WMP/EWMP. The approach taken by the Los Angeles MS4 Order to compliance here is similar to the provisions for compliance with receiving water limitations that are not otherwise addressed by a TMDL: The Permittee proposes control measures and a timeline that is as short as possible and is considered in compliance with the final numeric limitations while implementing the control measures consistent with the schedule. We find that, given the absence of an implementation plan with final compliance deadlines specified in the Los Angeles Water Board's water quality control

¹⁷¹ Wat. Code, § 13242.

¹⁷² *Id.*, See, e.g., § 13300.

¹⁷³ The Los Angeles MS4 Order's Fact Sheet states that the Los Angeles Water Board may choose to adopt implementation plans or issue enforcement orders in the future. (Los Angeles MS4 Order, Att. F, Fact Sheet, p. F-111.)

¹⁷⁴ Los Angeles MS4 Order, Part VI.E.3., pp. 145-146.

plan, this approach is consistent with the assumptions and requirements of the relevant wasteload allocations. We will not revise the provisions.

D. Non-Storm Water Discharge Provisions

Permittee Petitioners argue that the non-storm water discharge provisions of the Los Angeles MS4 Order are contrary to the Clean Water Act. Specifically, Permittee Petitioners assert that the Los Angeles MS4 Order improperly regulates non-storm water discharges from the MS4 to the receiving waters by imposing the prohibition of discharge “through the MS4 to the receiving waters” and by imposing WQBELs and other numeric limitations, rather than the MEP standard, on dry weather discharges.

The Los Angeles MS4 Order states that “[e]ach Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters” with certain exceptions including discharges separately regulated under an NPDES permit and discharges conditionally exempt from the prohibition consistent with the federal regulations.¹⁷⁵ Permittee Petitioners take issue with the imposition of the prohibition “through the MS4 to receiving waters” because the language does not track the specific requirement of the Clean Water Act that the MS4 permit “include a requirement to effectively prohibit non-stormwater discharges *into the storm sewer.*” (Emphasis added.)¹⁷⁶

We find the variation in language to be a distinction without a difference. Whether the Los Angeles MS4 Order prohibits non-storm water discharges *into* the MS4 or *through* the MS4 to receiving waters, the intent and effect of the prohibition is to prevent non-exempt non-storm water discharges from reaching the receiving waters.¹⁷⁷ The legal standard governing non-storm water – effective prohibition -- is not altered because the Los Angeles MS4 Order imposes the prohibition at the point of entry into the receiving water rather than the point of entry into the MS4 itself. Instructively, USEPA has used the terms “into,” “from,” and “through” interchangeably when describing the prohibition.¹⁷⁸

¹⁷⁵ *Id.*, Part III.A, pp 27-33.

¹⁷⁶ 33 U.S.C. § 1342(p)(3)(B)(ii).

¹⁷⁷ The Los Angeles Water Board notes that the language in the Los Angeles MS4 Order is not significantly changed from the version in the 2001 Los Angeles MS4 Order, which prohibited non-storm water discharges “into the MS4 and watercourses.” The Board additionally asserts that phrasing the prohibition as “through the MS4 to receiving waters” provides Permittees with greater flexibility to use measures that control non-storm water after it enters the MS4, including regional solutions such as low-flow diversions and catch-basin inserts.

¹⁷⁸ See, e.g., 55 Fed. Reg. 47990, 47995-47996 (“Section 402(p)(B)(3) of the CWA requires that permits for discharges *from municipal separate storm sewer systems* require the municipality to ‘effectively prohibit’ non-storm water discharges *from the municipal separate storm sewer*...Ultimately, such non-storm water discharges *through a municipal separate storm sewer* must either be removed from the system or become subject to an NPDES permit. . . . (Continued)

Permittee Petitioners' objection to the phrasing of the prohibition in the Los Angeles MS4 Order appears to be based largely on the assumption that prohibiting non-storm water discharges at the point of entry into the receiving water rather than at the point of entry into the MS4 allows the Los Angeles Water Board to impose requirements on those discharges that would otherwise not be available under the Clean Water Act and federal regulations. We disagree.

As a preliminary matter, regardless of the phrasing of the non-storm water discharge prohibition, MEP is not the standard that governs non-storm water discharges. Permittee Petitioners have asserted that, for non-storm water discharges that enter the MS4, MEP is the governing standard just as it is for storm water discharges. This assertion misinterprets the statute. The Clean Water Act imposes two separate standards for regulation of non-storm water and storm water in an MS4 permit: The MS4 permit "shall include a requirement to effectively prohibit non-stormwater discharges" into the MS4, and "shall require controls to reduce the discharge of pollutants to the maximum extent practicable. . . ." ¹⁷⁹ Although the statute imposes the MEP standard to control of "pollutants" rather than specifically to "pollutants in storm water," any reading of section 402(p)(3)(B)(iii) to apply generally to both non-storm water and storm water would render the effective prohibition of non-storm water in section 402(p)(3)(B)(ii) meaningless. The federal regulations confirm the distinction between the treatment of storm water and non-storm water by establishing requirements to prevent illicit discharges from entering the MS4. ¹⁸⁰ While the regulations have no definition for "non-storm water discharges," illicit discharges most closely represent the statutory term and are defined as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit . . . and discharges resulting from firefighting activities." ¹⁸¹ Further, contrary to assertions by Permittee Petitioners, the definition of storm water in the federal regulations is not inclusive of dry weather discharges. The federal regulations define storm water as "storm water runoff, snow melt runoff, and surface runoff and

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The CWA prohibits the point source discharge of non-storm water not subject to an NPDES permit *through municipal separate storm sewers to waters of the United States.*" (Emphasis added.)

¹⁷⁹ 33 U.S.C. § 1342(p)(3)(b)(iii).

¹⁸⁰ 40 C.F.R. § 122.26(d)(2)(iv)(B).

¹⁸¹ *Id.*, § 122.26(b)(2). The preamble to the regulations states: "Today's rule defines the term 'illicit discharge' to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit." (55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).)

drainage.”¹⁸² Surface runoff and drainage cannot be understood to refer to dry weather discharges where USEPA has specifically stated in the preamble to the relevant regulations that it would not expand the definition of storm water to include “a number of classes of discharges which are not in any way related to precipitation events.”¹⁸³ Accordingly, dry weather discharges are not a component of storm water discharges subject to the MEP standard.¹⁸⁴

Second, the Los Angeles Water Board’s legal authority to impose TMDL-based WQBELs and other limitations on dry weather discharges is derived not from the phrasing of the discharge prohibition in the statute but from the TMDLs themselves, as well as the Clean Water Act direction to require “such other provisions” as the permitting authority “determines appropriate for the control of such pollutants.” We have already found that the Los Angeles MS4 Order reasonably (and legally) incorporated numeric WQBELs and other limitations to implement the TMDLs. The Los Angeles Water Board’s authority to impose the limitations for dry weather conditions is accordingly independent of the provisions establishing the non-storm water effective prohibition.

Permittee Petitioners also assert that requiring compliance with the non-storm water discharge prohibition through and from the MS4 would frustrate enforcement of the illicit connection and illicit discharge elimination programs of the Los Angeles MS4 Order, which continue to require the Permittee to prohibit illicit discharges and connections to the MS4.¹⁸⁵ On this point, we agree with the Los Angeles Water Board that the illicit connection and illicit discharge elimination program is a means to implement the non-storm water prohibition and independently implementable and enforceable. We are more sympathetic to the argument by Permittee Petitioners that, in the context of a complex MS4 system with commingled discharges, the prohibition of discharges through the MS4 to the receiving waters poses greater compliance challenges than a prohibition of discharges into the MS4; however, the Los Angeles MS4 Order’s Monitoring and Reporting Program contains a procedure by which a Permittee will notify the Board and the upstream jurisdiction when non-exempted, non-storm water discharges pose an issue in commingled discharges.¹⁸⁶ Further, the Los Angeles Water Board states in its

¹⁸² 40 C.F.R. § 122.26(b)(13).

¹⁸³ 55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).

¹⁸⁴ We disagree that the phrasing of the non-storm water discharge prohibition in the Los Angeles MS4 Order means that *any* dry weather discharges from the MS4 could be construed as a violation of the Clean Water Act for the same reasons articulated in footnote 133 of this order.

¹⁸⁵ Los Angeles MS4 Order, Parts VI.A.2.a.iii, p. 40, VI.D.4.d., p. 81-86, VI.D.10, p. 137-141.

¹⁸⁶ Los Angeles MS4 Order, Att. E, Monitoring and Reporting Program, Part IX.F.6, p. E-27.

October 15, 2013 Response that the upstream jurisdiction would then have the responsibility to further investigate and address the discharge.¹⁸⁷ The challenge of addressing compliance and enforcement in the context of interconnected MS4s and commingled discharges is a challenge pervasive in the MS4 regulatory structure and not unique to non-storm water discharges. We are not sufficiently persuaded by Permittee Petitioners' arguments regarding compliance to disturb the non-storm water prohibitions as currently established in the Los Angeles MS4 Order.

E. Monitoring Provisions

Relying on Water Code sections 13165, 13225, and 13267, Permittee Petitioners argue that the Los Angeles Water Board was required to conduct a cost-benefit analysis to support the monitoring and reporting requirements of the Los Angeles MS4 Order. Because the monitoring and reporting provisions of the Los Angeles MS4 Order are incorporated pursuant to federal law, the cited provisions are inapplicable here. The monitoring and reporting provisions of the Los Angeles MS4 Order were established under the Clean Water Act and USEPA's regulations.¹⁸⁸ Further, under state law, Water Code section 13383, rather than Water Code section 13267, controls monitoring and reporting requirements in the context of NPDES permitting, and that provision does not include a requirement to ensure that the burden, including costs of the report, bear a reasonable relationship to the need for the report.¹⁸⁹

¹⁸⁷ Los Angeles Water Board, October 15, 2013 Response, p. 33 & fn. 116.

¹⁸⁸ See 33 U.S.C. §§ 1318, 1342(a)(2); 40 C.F.R. §§ 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)D, 122.41(h), 122.41(j), 122.41(l), 122.42(c), 122.44(i), 122.48.

¹⁸⁹ Permittee Petitioners argue that the cost considerations of Water Code sections 13225 and 13267 are relevant to the Los Angeles MS4 Order notwithstanding the fact that it was issued under federal authority because the requirements of those section are not inconsistent with the requirements of section 13383. (See Water Code, §13372, subd. (a) ("To the extent other provisions of this division are consistent with the requirements for state programs . . . those provisions apply . . .").) This exact assertion was taken up by the trial court in litigation challenging the 2001 Los Angeles MS4 Order and decided in favor of the Los Angeles Water Board. The trial court stated: "As noted in *Silkwood v. Kerr-McGee Corp.* (1984) 464 U.S. 238, the Court held, in part: 'state law is still preempted. . . where the state law stands as an obstacle to the accomplishment of the full purposes and objectives of Congress.' (464 U.S. at p. 248.) Applying Water Code sections 13225 and 13267 would stand, in the words of *Silkwood* as: 'an obstacle to the accomplishment of the full purposes and objectives of [the federal law].' (Ibid)." (*In re Los Angeles County Municipal Storm Water Permit Litigation* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase II Trial on Petitions for Writ of Mandate, at pp.19-20 (Administrative Record, section 10.II., RB-AR23197-23198.).) Further, we note that Water Code section 13383, subdivision (c) specifically references subdivision (c) of section 13267 when establishing facility inspection requirements; in contrast, section 13383, subdivision (a) does not reference subdivision (b) of section 13267, which incorporates the requirement that "[t]he burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." Water Code section 13383, subdivision (a), was therefore arguably intended to stand in place of the requirements in section 13267(b). Finally, even where authority to impose a monitoring and reporting requirement is clearly derived from Water Code section 13267, the provision requires consideration of the costs and benefits of monitoring and reporting, but not a full cost-benefit analysis. We therefore find that the Los Angeles Water Board did not fail to meet its legal obligations by not carrying out a full cost-benefit analysis specific to the monitoring and reporting requirements of the Los Angeles MS4 Order. However, in making this finding, in no way do we mean to disavow the significance of cost consideration in permitting actions, even where not specifically required by law. We note again that the Los Angeles Water Board carefully considered the costs of (Continued)

Moreover, the monitoring and reporting requirements of the Los Angeles MS4 Order do not exceed the requirements of the Clean Water Act and the federal regulations.¹⁹⁰ In particular, we find that the receiving water monitoring requirements of the Order are reasonable in light of the need to identify water quality exceedances and evaluate progress in compliance with water quality standards. The argument made by several Permittee Petitioners that the federal regulations allow only two types of monitoring – effluent and ambient – for compliance is without support in the relevant regulations. The relevant law is clear that the permitting authority is required to incorporate monitoring and reporting requirements sufficient to determine compliance with the permit conditions.¹⁹¹ In contrast, nothing in the Clean Water Act or the regulations states that requiring wet weather receiving water monitoring is beyond the authority of the permitting agency.¹⁹² Further, accepting such a constrained interpretation of the Clean Water Act’s monitoring requirements would undermine storm water permitting assessment. Excluding wet weather receiving water monitoring would preclude storm water dischargers from assessing the impacts of their discharges on waters of the United States during the events for which they are primarily being permitted—storm events. We find nothing in the text or preamble of the federal regulations to support a narrow interpretation of monitoring to exclude wet weather receiving monitoring.

To the extent Permittee Petitioners are arguing that the MEP standard, applied at the outfall, constrains the permitting authority’s discretion to require monitoring beyond the outfall, we also find no support in the law for that proposition. We have already stated that we will continue to require compliance with water quality standards in MS4 permits. Wet weather receiving water monitoring is fundamental to assessing the effects of storm water discharges on water quality and determining the trends in water quality as Permittees implement control

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compliance with the Los Angeles MS4 Order generally as summarized in the Fact Sheet. (See Los Angeles MS4 Order, Att. F, Fact Sheet, pp. F-144-F-149.) Further, the Los Angeles Water Board considered monitoring costs-related comments on earlier drafts of the Los Angeles MS4 Order, and, in a number of cases, where presented with an argument that a cost related to a particular monitoring requirement was not commensurate with the benefits to be received from that requirement, made revisions to the requirement. (See, e.g., Administrative Record, section 8, RB-AR19653-19654, RB-AR19666, RB-AR19674, RB-AR19681.)

¹⁹⁰ The Los Angeles Water Board provided its rationale for the receiving water monitoring requirements in the Fact Sheet of the Los Angeles MS4 Order. (Los Angeles MS4 Order, Att. F, Fact Sheet, F-113-F-137.)

¹⁹¹ See 33 U.S.C. § 1318(a)(2); 40 C.F.R. § 122.26(d)(2)(i)(F). While we do not interpret these requirements to mean that each and every permit condition must have a corresponding monitoring and reporting requirement, neither do we see any constraints on the water boards’ authority to establish monitoring and reporting requirements.

¹⁹² Permittee Petitioners reference language in the federal regulations concerning “effluent and ambient monitoring” (40 C.F.R. § 122.44(d)(1)(vi)(C)(3)) and appear to be using the phrase as support for their argument. That section is inapposite as it applies to situations where a State has not established a water quality objective for a pollutant present in the effluent and instead establishes effluent limitations on an indicator parameter for the pollutant of concern.

measures. Compliance may be determined at the outfall – for example, where a permittee determines that the discharge does not exceed an applicable WQBEL or receiving water limitation – but outfall monitoring alone cannot provide the broader data related to trends in storm water discharge impacts on the receiving water. Accordingly, receiving water monitoring is a legal and reasonable component of the monitoring and reporting program. Further, because Permittees are responsible for impacts to the receiving waters resulting from their MS4 discharges, Permittees may be required to participate in monitoring not only in receiving waters within their jurisdiction but also in monitoring all receiving waters that their discharges impact.

We will make no revisions to the Monitoring and Reporting provisions of the Order.

F. Joint Responsibility

In the extensive and interconnected system regulated by the Los Angeles MS4 Order, discharges originating from one Permittee's MS4 frequently commingle with discharges from other Permittees' MS4s within or outside of the Permittee's jurisdiction. Permittee Petitioners argue that the Los Angeles MS4 Order improperly ascribes responsibility to all Permittees with commingled discharges where those commingled discharges exceed a WQBEL or cause or contribute to exceedances of receiving water limitations. Specifically, Permittee Petitioners take issue with the fact that the Los Angeles MS4 Order ascribes "joint responsibility"¹⁹³ to the co-Permittees without a showing that a particular Permittee has in fact discharged the pollutant causing or contributing to the exceedance.

The Los Angeles Water Board counters that the joint responsibility regime is consistent with the intent of the Clean Water Act and further that it does not compel a Permittee to clean up the discharge of another Permittee. The Los Angeles Water Board points to two provisions for this latter proposition. First, even with joint responsibility, Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators.¹⁹⁴ Second, even where joint responsibility is presumed, a Permittee may subsequently counter the presumption of joint responsibility by

¹⁹³ "Joint responsibility" is the term used in the Los Angeles MS4 Order. (See Los Angeles MS4 Order, Part II.K.1, p. 23 ("Joint responsibility" means that the Permittees that have commingled MS4 discharges are responsible for implementing programs in their respective jurisdictions, or within the MS4 for which they are an owner and/or operator, to meet the water quality-based effluent limitations and/or receiving water limitations assigned to such commingled MS4 discharges.") As defined by the Los Angeles Water Board and as discussed below, this term does not have the same meaning and scope as the legal doctrine of "joint liability.")

¹⁹⁴ Los Angeles MS4 Order, Parts II.K.1, pp. 23-24, VI.A.4.a., p. 41; 40 C.F.R. § 122.26(a)(3)(vi); see also, *id.*, Part VI.E.2.b.ii., p. 142 (stating in the context of TMDL requirements that, where discharges are commingled and assigned a joint WLA, "each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.")

affirmatively demonstrating that its MS4 discharge did not cause or contribute to the relevant exceedances.¹⁹⁵

Given the size and complexity of the MS4s regulated under the Los Angeles MS4 Order and the challenges inherent in designing a monitoring program that could parse out responsibility for each individual Permittee, we find that a joint responsibility regime is a reasonable approach to assigning initial responsibility for an exceedance. The Los Angeles MS4 Order provisions addressing TMDLs also appropriately take a joint responsibility approach, given that the wasteload allocations from which the WQBELs and other TMDL-specific limitations are derived are most frequently expressed as joint allocations shared by all MS4 dischargers in the watershed. We further agree with the Los Angeles Water Board that the regime is one that is permissible under applicable law. The Clean Water Act contemplates that MS4 permits may be issued on a system-wide or jurisdiction-wide basis¹⁹⁶ and the federal regulations anticipate the need for inter-governmental cooperation.¹⁹⁷ Further, the United States Court of Appeal, Ninth Circuit, recently stated in *Natural Resources Defense Council v. County of Los Angeles* (2013) 725 F.3d 1194 that the permitting authority has wide discretion concerning the terms of a permit, including the manner in which permittees share liability.¹⁹⁸

Yet, we also find that joint responsibility in an MS4 Order is only appropriate if the ultimate responsibility for addressing an exceedance rests with those permittees that actually cause or contribute to the exceedance in question. The re-issued Los Angeles MS4 Order contains additional specificity and monitoring, beyond that contained in the 2001 Los Angeles MS4 Order, to document compliance and the presence or absence of an individual municipality's contribution of pollutants to the storm water. For this reason, the general reasoning of the Ninth Circuit's 2013 *Natural Resources Defense Council v. County of Los Angeles* decision finding liability based solely on the presence of pollutants above water quality standards in the receiving waters is of limited forward-looking importance. Generally, in the context of MS4 permits, we do not sanction joint responsibility to the extent that that joint

¹⁹⁵ *Id.*, Part VI.E.2., pp.141-42; see also *id.*, Part II.K.1, pp. 23-24.

¹⁹⁶ 33 U.S.C. § 1342(p)(3)(B)(i).

¹⁹⁷ See 40 C.F.R. §§ 122.26(d)(2)(i)(D), 122.26(d)(2)(iv), 122.26(d)(2)(vii).

¹⁹⁸ *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, 1205, fn. 16, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135. The Ninth Circuit went on to find that, based on the specific language of the 2001 Los Angeles MS4 Order, the Permittees were jointly liable for exceedances detected by mass emissions monitoring.

responsibility would require each Permittee to take full responsibility for addressing violations, regardless of whether, and to what extent, each permittee contributed to the violation.¹⁹⁹

The Los Angeles MS4 Order does not impose such a joint responsibility regime where each Permittee must take full responsibility for addressing other Permittees' violations. In addition to clearly stating that permittees are responsible only for their contribution to the commingled discharges, the Los Angeles MS4 Order provides that Permittees may affirmatively show that their discharge did not cause or contribute to an exceedance. Joint responsibility, as applied by the Los Angeles MS4 Order, is thus consistent with our expectation that ultimate responsibility for addressing an exceedance rests with those Permittees that actually cause or contribute to the exceedance and consistent with the regulatory direction that co-permittees need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators.

While the result is that the burden rests on the Permittee to demonstrate that its commingled discharge is not the source of an exceedance, rather than on the Los Angeles Water Board to demonstrate that a Permittee's commingled discharge is causing or contributing to the exceedance, the result is not contrary to law. The Los Angeles Water Board has the initial burden to show that a violation of the Los Angeles MS4 Order has occurred,²⁰⁰ but the Board can do so by establishing an exceedance of a limitation by jointly responsible Permittees and need not identify the exact source of the exceedance. This scheme represents a reasonable policy approach to a complicated compliance question where the Permittees are more closely familiar than the Los Angeles Water Board with their outfalls and their discharges in the extensive and interconnected MS4 network.

We are, however, concerned that the Los Angeles MS4 Order's treatment of the joint responsibility issue is too narrow. The Los Angeles Water Board addresses the issue of joint responsibility primarily in the context of compliance with the TMDL requirements of the Order. Commingled discharges pose the same questions of assigning responsibility where receiving water limitations are exceeded in water bodies receiving MS4 discharges from multiple jurisdictions, but where the pollutant is not addressed by a TMDL. A similar approach to

¹⁹⁹ In a "joint and several liability" scheme, a plaintiff may collect his or her entire damages from any one defendant, and the defendants must then rely on principles of indemnity or contribution to apportion ultimate liability amongst themselves. (See *American Motorcycle Assn. v. Superior Court of Los Angeles County* (1978) 20 Cal. 3d 578, 586-590.) Because the Los Angeles MS4 Order's joint responsibility scheme does not equate to joint liability, and because we do not find such liability appropriate from a policy perspective, we do not address Petitioners' legal arguments as to whether joint or joint and several liability in the storm water context would be consistent with applicable law.

²⁰⁰ See e.g. *Sackett v. E.P.A.* (9th Cir. 2010) 622 F.3d 1139 rev'd on other grounds *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367.

assigning responsibility for addressing the exceedances is appropriate there. We will add new language to the Los Angeles MS4 Order mirroring Part VI.E.2.b., but applying the principles more generally.

We also take this opportunity to emphasize that all MS4 permits should be drafted to avoid one potential, but likely unintended, result arising from *Natural Resources Defense Council v. County of Los Angeles*. The broadest reading of the Ninth Circuit's holding following remand from the U.S. Supreme Court would assign joint liability to all Permittees for any exceedance at a monitoring location designated for the purpose of compliance determination, even if the particular pollutant is not typically found in storm water and has a likely alternative source such as an industrial discharger or waste water treatment plan. Providing municipalities an opportunity to demonstrate that they did not contribute to a pollutant present in receiving waters above standards will prevent this outcome.

We shall amend Part VI.B. as follows:

B. Monitoring and Reporting Program (MRP) Requirements

- 1.** Dischargers shall comply with the MRP and future revisions thereto, in Attachment E of this Order or may, in coordination with an approved Watershed Management Program per Part VI.C, implement a customized monitoring program that achieves the five Primary Objectives set forth in Part II.A. of Attachment E and includes the elements set forth in Part II.E. of Attachment E.

2. Compliance Determination for Commingled Discharges

- a. For commingled discharges addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part E as specified at Part E.2.b.**
- b. For commingled discharges not addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part V.A as follows:**
 - i. Pursuant to 40 CFR section 122.26(a)(3)(vi), each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.**
 - ii. Where Permittees have commingled discharges to the receiving water, or where Permittees' discharges commingle in the receiving water, compliance in the receiving water shall be determined for the group of Permittees as a whole unless an individual Permittee demonstrates that its discharge did not cause or contribute to the exceedance, pursuant to subpart iv. below.**

- iii. For purposes of compliance determination, each Permittee is responsible for demonstrating that its discharge did not cause or contribute to an exceedance of the receiving water limitation in the target receiving water.
- iv. A Permittee may demonstrate that its discharge did not cause or contribute to an exceedance of a receiving water limitation in one of the following ways:
 - (1) Demonstrate that there was no discharge from the Permittee's MS4 into the applicable receiving water during the relevant time period;
 - (2) Demonstrate that the discharge from the Permittee's MS4 was controlled to a level that did not cause or contribute to the exceedance in the receiving water;
 - (3) Demonstrate that there is an alternative source of the pollutant that caused the exceedance, that the pollutant is not typically associated with MS4 discharges, and that the pollutant was not discharged from the Permittee's MS4; or
 - (4) Demonstrate that the Permittee is in compliance with the Watershed Management Programs provisions under VI.C.

G. Separation of Functions in Advising the Los Angeles Water Board

Petitioners Cities of Duarte and Huntington Park (Duarte and Huntington Park) argue that their rights to due process of law were violated when the same attorneys advised both the Los Angeles Water Board staff and the Board itself in the course of the proceedings to adopt the Los Angeles MS4 Order. We disagree and reaffirm our position that permitting actions do not require the water boards to separate functions when assigning counsel to advise in development and adoption of a permit.

A water board proceeding to adopt a permit, including an NPDES permit, waste discharge requirements, or a waiver of waste discharge requirements, is an adjudicative proceeding subject to the Administrative Procedure Act's administrative adjudication statutes in Government Code section 11400 et seq.²⁰¹ Section 11425.10, part of the "Administrative Adjudication Bill of Rights," provides that "[t]he adjudicative function shall be separated from the investigative, prosecutorial, and advocacy functions with the agency" ²⁰² In accordance with

²⁰¹ See Cal. Code Regs., tit. 23, § 648, subd. (b).

²⁰² Gov. Code, § 11425.10, subd. (a)(4). Subdivision (a)(4) references section 11425.30, which addresses disqualification of a presiding officer that has served as "investigator, prosecutor, or advocate" in the proceeding or its preadjudicative stage or is subject to "the authority, direction, or discretion" of a person who has served in such roles.

this directive, the water boards separate functions in all enforcement cases, assigning counsel and staff to prosecute the case, and separate counsel and staff to advise the board.

In a permitting action, water board counsel have an advisory role, not an investigative, prosecutorial, or advocacy role. Permitting actions are not investigative in nature and there is no consideration of liability or penalties that would make the action prosecutorial in nature. Further, while both counsel and staff are expected to develop recommendations for their boards, the role of counsel and staff is not to act as an advocate for one particular position or party concerning the permitting action, but to advise the board as neutrals, with consideration of the legal, technical, and policy implications of all options before the board. In the case of counsel, such consideration and advice includes not just legal evaluation of the substantive options for permitting but also of procedural issues such as admissibility of the evidence, conduct of the hearing, and avoidance of board member conflicts. Because counsel and staff are advisors to the board rather than advocates for a particular position, the same counsel may advise staff in the course of development of the permit and the board in the adoption proceedings.

A primary purpose of separation of functions in adjudicatory proceedings is the need to prevent improper ex parte communications.²⁰³ The exceptions to the ex parte communications rules further support the position that counsel advising board staff may also advise the board itself. While section 11430.10 of the Government Code generally prohibits communications concerning issues in a pending administrative proceeding between the presiding officer and an employee of the agency that is a party,²⁰⁴ one exception provides that a communication “for the purpose of assistance and advice to the presiding officer,” in this case the board, “from a person who has not served as investigator, prosecutor, or advocate in the proceeding or its preadjudicative stage” is permissible. Even if board counsel could be considered an advocate in the proceeding, another provision (specifically referencing the water boards) excepts the communication from the general ex parte communications rules. A communication is not an ex parte communication if:

- (c) The communication is for the purpose of advising the presiding officer concerning any of the following matters in an adjudicative hearing that is nonprosecutorial in character:

²⁰³ See *Dept. of Alcoholic Beverage Control v. Alcoholic Beverage Control Appeals Bd.* (2006) 40 Cal.4th 1, 9-10.

²⁰⁴ Government Code section 11430.10 prohibits communications between an employee that is a “party” to a pending proceeding and the presiding officer. We disagree that Los Angeles Water Board staff, as an advisor to the Board, was a “party” to the proceedings for adoption of the Los Angeles MS4 Order, but, even if staff could be considered a party, the cited exceptions to the ex parte communications rules would apply.

...
(2) The advice involves an issue in a proceeding of the San Francisco Bay Conservation and Development Commission, California Tahoe Regional Planning Agency, Delta Protection Commission, Water Resources Control Board, or a regional water quality control board.²⁰⁵

The fact that communications that would otherwise be considered prohibited *ex parte* communications are specifically permitted in non-prosecutorial adjudicative proceedings of the water boards further supports the position that the water boards are not obligated by law to separate functions in permitting actions.

We acknowledge that there may be some unique factual circumstances under which a permitting proceeding could violate due process or the Administrative Procedure Act because board counsel either acted or gave the appearance of acting as a prosecutor or advocate. Duarte and Huntington Park point to a writ of mandate issued by the Los Angeles Superior Court in 2010,²⁰⁶ holding that a 2006 proceeding to incorporate provisions of the Santa Monica Bay Beaches TMDL into the 2001 Los Angeles MS4 Order was not fairly conducted because Los Angeles Water Board counsel had acted as an advocate for Board staff, directly examining Board staff witnesses, cross-examining witnesses called by permittees, objecting to questions asked by permittees, and making a closing argument on behalf of Board staff, while simultaneously advising the Board. The proceedings to adopt the Los Angeles MS4 Order did not follow the type of adversarial structure that led the Superior Court to find a violation of separation of functions in the 2006 proceedings.²⁰⁷ Further, nothing in the conduct of the Los Angeles Water Board attorneys in the Los Angeles MS4 Order proceedings leads us to find that they acted as advocates for a particular position or party, rather than as advisors to the Board.

²⁰⁵ Gov. Code, § 11430.30. We note that the Law Revision Commission comments on section 11430.30, subdivision (c), state that “[s]ubdivision (c) applies to nonprosecutorial types of administrative adjudications, such as . . . proceedings . . . setting *water quality protection . . . requirements*.” (Emphasis added.) The notes further state that “[t]he provision recognizes that the length and complexity of many cases of this type may as a practical matter make it impossible for any agency to adhere to the restrictions of [ex parte communications], given limited staffing and personnel.” (25 Cal.L.Rev.Comm. Reports 711 (1995).) We agree that the lengthy and complex nature of permitting proceedings, and the limited staffing resources of the water boards, caution against an expansive interpretation of separation of functions in non-prosecutorial adjudications.

²⁰⁶ *County of Los Angeles v. State Water Resources Control Board* (Super. Ct., Los Angeles Co. (June 2, 2010, Minute Order) No. BS122724) (Administrative Record, section 10.II, RB-AR23665-23667.)

²⁰⁷ We also note that, although the writ directed that petitioners were entitled to a new hearing “in which the same person does not act as both an advocate before the Board and an advisor to the Board,” the writ had no direct bearing on the separate proceedings to adopt the Los Angeles MS4 Order. In any case, as discussed, Board attorneys did not act as advocates in the proceedings to adopt the Los Angeles MS4 Order.

The two specific cases pointed to by Duarte and Huntington Park – advice by Board counsel to Board member Mary Ann Lutz regarding recusal due to ex parte communications and advice to the Board generally on the lack of a cost-benefit analysis requirement in federal law – may be contrary to the legal position held by Duarte and Huntington Park, but there is nothing in the record to suggest that the advice was driven by biased advocacy for a Board staff position.²⁰⁸ In the absence of such evidence, we find no reason to depart from the general rule that separation of functions is not required in a permitting proceeding²⁰⁹ and find that Los Angeles Water Board counsel acted in accordance with applicable laws in advising Board staff and the Board itself.

H. Signal Hill's Inclusion in the Order

The City of Signal Hill (Signal Hill) argues that the Los Angeles Water Board acted contrary to relevant law when it issued the system-wide Los Angeles MS4 Order that included Signal Hill, even though Signal Hill had submitted an application for an individual permit.²¹⁰ We disagree.

Signal Hill points out that the federal regulations allow an operator of an MS4 to choose between submitting an application jointly with one or more other operators for a joint permit or individually for a distinct permit.²¹¹ However, the choice of application does not necessarily dictate the type of permit that the permitting authority ultimately deems appropriate. The permitting authority in turn has discretion to determine if the permit should be issued on a

²⁰⁸ See Administrative Record, section 7, RB-AR18309-18316, RB-AR18397-18400 (Transcript of Proceedings on Oct. 4, 2012), section 7, RB-AR18892-18894 (Transcript of Proceedings on Oct. 5, 2012).

²⁰⁹ Although *Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731 concerned an enforcement proceeding and therefore is not on point for our legal determination above, we take note of the direction by the California Supreme Court that separation of functions in an administrative tribunal should not be expanded beyond its appropriate scope: “In construing the constitutional due process right to an impartial tribunal, we take a more practical and less pessimistic view of human nature in general and of state administrative agency adjudicators in particular . . . [and where proper procedure is followed and in the absence of a specific demonstration of bias or unacceptable risk of bias] we remain confident that state administrative agency adjudicators will evaluate factual and legal arguments on their merits, applying the law to the evidence in the record to reach fair and reasonable decisions.” (*Morongo Band of Mission Indians, supra*, at pp. 741-742.)

²¹⁰ Signal Hill was one of several permittees under the 2001 Los Angeles MS4 Order that elected not to submit an application jointly with the other permittees for the renewed permit. The other parties have not challenged their inclusion under the Los Angeles MS4 Order. The Los Angeles Water Board rejected Signal Hill's application as incomplete; however, our determination that the Los Angeles Water Board had the discretion to issue the system-wide Los Angeles MS4 Order is not dependent on that fact.

²¹¹ 40 C.F.R. § 122.26(a)(3)(iii). Signal Hill has also cited regulations applicable to Small MS4s at 40 Code of Federal Regulations sections 122.30 through 122.37. These regulations are not applicable here because the Los Angeles Water Board has designated the Greater Los Angeles County MS4, which includes the incorporated cities and the unincorporated areas of Los Angeles County within coastal watersheds, as a large MS4 pursuant to 40 Code of Federal Regulations section 122.26(b)(4).

jurisdictional or system-wide basis.²¹² While the federal regulations do not specifically state that, in exercising that discretion, the permitting authority may override the permit applicant's preference for an individual permit, nothing in the regulations constrains its authority to do so. Section 122.26(a)(3)(iii) of 40 Code of Federal Regulations does not require the permitting authority to take any specific action in response to the submission of an individual application. And sections 122.26(a)(3)(ii) and 122.26(a)(3)(iv) provide that the permitting authority "may issue" system-wide or distinct permits. The preamble to the regulations similarly contemplates wide discretion for the permitting authority to choose system-wide permits, including a permit that would allow an entire system in a geographical region to be designated under one permit.²¹³ Particularly because the option of a system-wide permit would be significantly frustrated if MS4 operators were allowed to opt out at their discretion, the most reasonable reading of the regulations is that the permitting authority, not the applicant, makes the ultimate decision as to the scope of the permit that will be issued. Accordingly, we find that the Los Angeles Water Board had the discretion under the relevant law to issue the Los Angeles MS4 Order with Signal Hill as a permittee.

We also find that the Los Angeles Water Board's decision regarding Signal Hill was appropriately supported by findings in the Order and in the Fact Sheet.²¹⁴ Finding C of the Los Angeles MS4 Order, as well as discussion in the Fact Sheet,²¹⁵ establishes that the Los Angeles Water Board found a system-wide permit to be appropriate for a number of reasons, including that Permittees' MS4s comprise a large interconnected system with frequently commingled discharges, that the TMDLs to be implemented apply to the jurisdictional areas of multiple Permittees, that the passage of Assembly Bill 2554²¹⁶ in 2010 provided a potential means for funding collaborative water quality improvement plans among Permittees, and that the results of an online survey conducted by Los Angeles Water Board staff showed that the

²¹² 33 U.S.C. § 1342(p)(3)(B)(i); 40 C.F.R. § 122.26(a)(1)(v), (a)(3)(ii), (a)(3)(iv).

²¹³ See 55 Fed. Reg. 47990, 48039-48043 (preamble to the Phase I regulations noting that section 122.26(a)(3)(iv) would allow an entire system in a geographical region to be designated under one permit and further discussing that sections 122.26(a)(1)(v) and (a)(3)(ii) allow the permitting authority broad discretion in issuing system-wide permits).

²¹⁴ *Topanga Assn.*, *supra*, 11 Cal.3d at 515.

²¹⁵ Los Angeles MS4 Order, Part II.C., pp. 14-15; *id.*, Att. F, Fact Sheet, pp. F-15-F-18.

²¹⁶ Assembly Bill No. 2554, Chapter 602, an act to amend sections 2 and 16 of the Los Angeles County Flood Control Act (Chapter 755 of the Statutes of 1915), relating to the Los Angeles County Flood Control District, Sept. 30, 2010 (Administrative Record, section 10.VI.C., RB-AR29172-29179). The Bill allows the Los Angeles County Flood Control District to assess a property-related fee or charge, subject to voter approval in accordance with proposition 218, for storm water and clean water programs.

majority of Permittees favored either a single MS4 permit for Los Angeles County or several watershed-based permits.

Signal Hill points out that the reasons enumerated by the Los Angeles Water Board as grounds for issuance of a system-wide permit did not preclude the Los Angeles Water Board from issuing an individual permit to the City of Long Beach (Long Beach).²¹⁷ The Los Angeles Water Board has provided the rationale for distinguishing Signal Hill and Long Beach in its October 15, 2013 Response. The Los Angeles Water Board explains that Long Beach has had an individual permit for more than a decade and that, unlike Signal Hill, it was not permitted under the 2001 Los Angeles MS4 Order. The Board's decision to issue a separate permit to Long Beach was originally the result of a settlement agreement that resolved litigation on the MS4 permit issued by the Los Angeles Water Board in 1996, and Long Beach has a proven track record in implementing the individual permit while cooperating with Permittees under the Los Angeles MS4 Order.²¹⁸ We find that the Los Angeles Water Board reasonably distinguished between Long Beach and the Permittees under the Los Angeles MS4 Order in making determinations as to individual permitting. We will not reverse its determination but we will add a brief statement reflecting that reasoning to the Fact Sheet.

We shall amend section III.D.1.a. at page F-18, Attachment F, Fact Sheet, as follows:

The Regional Water Board determined that the cities of Signal Hill and Downey, the five upper San Gabriel River cities, and the LACFCD are included as Permittees in this Order. **In making that determination, the Regional Water Board distinguished between the permitting status of those cities and the permitting status of the City of Long Beach at this time because the City of Long Beach has a proven track record in implementing an individual permit and developing a robust monitoring program under that individual permit, as well as in cooperation with other MS4 dischargers on watershed based implementation. While all other incorporated cities with discharges within the coastal watersheds of Los Angeles County, as well as Los Angeles County and the Los Angeles County Flood Control District, are permitted under this Order,** individually tailored permittee requirements are provided in this Order, where appropriate.

²¹⁷ Signal Hill is located in the geographical middle of Long Beach and is entirely surrounded by that city.

²¹⁸ Los Angeles Water Board, October 15, 2013 Response, p. 25, fn. 78.

III. CONCLUSION

Based on the above discussion, we conclude as follows:

1. Although we are not bound by federal law or state law to require compliance with water quality standards in municipal storm water permits, we will not depart from our prior precedent regarding compliance with water quality standards. The regional water boards shall continue to require compliance with receiving water limitations in municipal storm water permits through incorporation of receiving water limitations provisions consistent with State Water Board Order WQ 99-05.
2. However, we find that municipal storm water dischargers may not be able to achieve water quality standards in the near term and therefore that it is appropriate for municipal storm water permits to incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.
3. We find that the WMP/EWMP provisions of the Los Angeles MS4 Order, with minor revisions that we incorporate herein, are an appropriate alternative to immediate compliance with receiving water limitations. The WMP/EWMP provisions are ambitious, yet achievable, and include clear and enforceable deadlines for the achievement of receiving water limitations and a rigorous and transparent process for development and implementation of the WMPs/EWMPs.
4. We find that the WMP/EWMP provisions do not violate anti-backsliding requirements.
5. We find that the WMP/EWMP provisions do not violate antidegradation requirements; however, we find that the antidegradation findings made by the Los Angeles Water Board are too cursory and revise those findings consistent with the federal and state antidegradation policies.
6. We find that issuance of time schedule orders is appropriate where a final receiving water limitations deadline set in the WMP/EWMP or a final TMDL-related deadline is not met; however we find that the WMP/EWMP compliance schedule need not otherwise be structured as an enforcement order.
7. We clarify the WMP/EWMP provisions to make it clear that final compliance with receiving water limitations and final WQBELs and other TMDL-specific limitations must be verified through monitoring.

8. We clarify the WMP/EWMP provisions to make it clear that Permittees may request extensions of deadlines incorporated into the WMPs/EWMPs except those final deadlines established in a TMDL. However, any deadline extensions must be approved by the Executive Officer after public review and comment.
9. In order to add greater rigor and accountability to the process of achieving receiving water limitations, we revise the WMP/EWMP provisions to add that the Permittees must comprehensively evaluate new data and information and revise the WMPs/EWMPs, including the supporting reasonable assurance analysis, by June 30, 2021, for approval by the Executive Officer.
10. We find that the storm water retention approach is a promising approach to achieving receiving water limitations, but also find that the Administrative Record does not support a finding that the approach will necessarily lead to achievement of water quality standards in all cases. We revise the WMP/EWMP provisions to clarify that, in the case of implementation of an EWMP with the storm water retention approach, if compliance with a final WQBEL or other TMDL-specific limitation is not in fact achieved in the drainage area, a Permittee will be considered in compliance with the relevant limitation only if the Permittee continues to adaptively manage the EWMP to achieve ultimate compliance with the WQBEL or other TMDL limitation.
11. We find reasonable the WMP/EWMP provisions that allow permittees to be deemed in compliance with receiving water limitations during the planning and development phase of the WMP/EWMP. We revise the WMP/EWMP provisions to state that, if a Permittee fails to meet one of the deadlines, the Permittee may still develop a WMP/EWMP for approval by the Los Angeles Water Board or its Executive Officer; however, the Permittee will not be deemed in compliance with receiving water limitations or WQBELs and other TMDL-specific limitations during the subsequent WMP/EWMP development period.
12. We recognize that the Los Angeles MS4 Order WMP/EWMP compliance path alternative may not be appropriate in all MS4 permits. In order to provide guidance to regional water boards preparing Phase I MS4 permits, we lay out several principles to be followed in drafting receiving water limitations compliance alternatives: Phase I MS4 permits should (1) continue to require compliance with water quality standards in accordance with our Order WQ 99-05; (2) allow compliance with TMDL requirements to constitute compliance with receiving water limitations; (3) provide for a compliance

alternative that allows permittees to achieve compliance with receiving water limitations over a period of time as described above; (4) encourage watershed-based approaches, address multiple contaminants, and incorporate TMDL requirements; (5) encourage the use of green infrastructure and the adoption of low impact development principles; (6) encourage the use of multi-benefit regional projects that capture, infiltrate, and reuse storm water; and (7) require rigor, accountability, and transparency in identification and prioritization of issues in the watershed, in proposal and implementation of control measures, in monitoring of water quality, and in adaptive management of the program. We expect the regional water boards to follow these principles unless the regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.

13. We recognize that the success of the WMP/EWMP approach depends in large part on the steps that follow adoption of the provisions, including the development and approval of rigorous WMPs/EWMPs and the implementation and appropriate enforcement of the programs once approved. We direct the Los Angeles Water Board to periodically report specific information to the State Water Board regarding implementation of the WMPs/EWMPs, including on-the-ground structural control measures completed, monitoring data evaluating the effectiveness of such measures, control measures proposed to be completed and proposed funding and schedule, trends in receiving water quality related to storm water discharges, and compliance and enforcement data.
14. We find that the Los Angeles Water Board acted in a manner consistent with the law when establishing numeric WQBELs. We further find that the development of numeric WQBELs was a reasonable exercise of the Los Angeles Water Board's policy discretion, given its experience in developing the relevant TMDLs and the significance of storm water impacts in the region. However, we find that numeric WQBELs are not necessarily appropriate in all MS4 permits or for all parameters in any single MS4 permit.
15. We find that the Los Angeles Water Board's choice of BMP-based WQBELs, to be proposed by the Permittee in the WMP/EWMP to address USEPA-established TMDLs was reasonable.

16. We find that the Los Angeles Water Board did not act contrary to federal law when it prohibited the discharge of non-storm water “through the MS4 to receiving water” instead of “into” the MS4. Regardless of the exact wording of the prohibition, the standard that applies to non-storm water is the requirement of “effective prohibition.” However, the Los Angeles Water Board also has authority to regulate any dry weather discharges from the MS4s under the applicable TMDLs.
17. We find that the monitoring and reporting provisions of the Los Angeles MS4 Order are consistent with applicable law and reasonable.
18. We find that assigning joint responsibility for commingled discharges that cause exceedances is not contrary to applicable law. Given the size and complexity of the MS4s regulated under the Los Angeles MS4 Order, the joint responsibility regime also constitutes a reasonable policy choice. The Los Angeles MS4 Order specifically allows a permittee to avoid joint responsibility by demonstrating that its commingled discharge is not the source of an exceedance.
19. We find that representation of the Los Angeles Water Board and the Los Angeles Water Board staff by the same attorneys in the proceedings to adopt the Los Angeles MS4 Order was lawful and reasonable.
20. We find that the Los Angeles Water Board acted in a manner consistent with applicable law and reasonably when it issued a system-wide permit that included Signal Hill.

Addressing the water quality impacts of municipal storm water is a complex and difficult undertaking, requiring innovative approaches and significant investment of resources. We recognize and appreciate the commendable effort of the Los Angeles Water Board to come up with a workable and collaborative solution to the difficult technical, policy, and legal issues, as well as the demonstrated commitment of many of the area’s MS4 dischargers and of the environmental community to work with the Los Angeles Water Board in the development and implementation of the proposed solution. We also recognize the extensive work that interested persons from across the state, including CASQA, have invested in assisting us in understanding how the watershed-based alternative compliance approach developed by the Los Angeles Water Board may inform statewide approaches to addressing achievement of water quality requirements. While storm water poses an immediate water quality problem, we believe that a rigorous and transparent watershed-based approach that emphasizes low impact development, green infrastructure, multi-benefit projects, and capture, infiltration, and reuse of storm water is

a promising long-term approach to addressing the complex issues involved. We must balance requirements for and enforcement of immediate, but often incomplete, solutions with allowing enough time and leeway for dischargers to invest in infrastructure that will provide for a more reliable trajectory away from storm water-caused pollution and degradation. We believe that the Los Angeles MS4 Order, with the revisions we have made, strikes that balance at this stage in our storm water programs, but expect that we will continue to revisit the question of the appropriate balance as the water boards' experience in implementing watershed-based solutions to storm water grows.

IV. ORDER

IT IS HEREBY ORDERED that the Los Angeles MS4 Order is amended as described above in this order. The Los Angeles Water Board is directed to prepare a complete version of the Los Angeles MS4 Order (including any necessary non-substantive conforming corrections), post the conformed Los Angeles MS4 Order on its website, and distribute it as appropriate.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held June 16, 2015.

AYE: Chair Felicia Marcus
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Dorene D'Adamo

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

ATTACHMENT 35

3. WATER QUALITY OBJECTIVES

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Introduction

The Clean Water Act (§303) requires states to develop water quality standards for all waters and to submit to the USEPA for approval all new or revised water quality standards which are established for inland surface and ocean waters. Water quality standards consist of a combination of beneficial uses (designated in Chapter 2) and water quality objectives (contained in this Chapter).

In addition to the federal mandate, the California Water Code (§13241) specifies that each Regional Water Quality Control Board shall establish water quality objectives. The Water Code defines water quality objectives as "the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." Thus, water quality objectives are intended (i) to protect the public health and welfare and (ii) to maintain or enhance water quality in relation to the designated existing and potential beneficial uses of the water. Water quality objectives are achieved through Waste Discharge Requirements and other programs outlined in Chapter 4, Strategic Planning and Implementation. These objectives, when compared with future water quality data, also provide the basis for identifying trends toward degradation or enhancement of regional waters.

These water quality objectives supersede those contained in all previous Basin Plans and amendments adopted by the Los Angeles Regional Board. As new information becomes available, the Regional Board will review the objectives contained herein and develop new objectives as necessary. In addition, this Plan will be reviewed every three years (triennial review) to determine the need for modification.

Statement of Policy with Respect to Maintaining High Quality of Waters in California

A key element of California's water quality standards is the state's Antidegradation Policy. This policy, formally referred to as the *Statement of Policy with Respect to Maintaining High Quality Waters in California* (State Board Resolution No. 68-16), restricts degradation of surface or ground waters. In particular, this policy protects waterbodies where existing quality is higher than is necessary for the protection of beneficial uses.

**STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 68-16**

**STATEMENT OF POLICY WITH RESPECT TO
MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA**

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.
2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.
3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968

Original signed by
Kerry W. Mulligan, Executive Officer
State Water Resources Control Board

Under the Antidegradation Policy, any actions that can adversely affect water quality in all surface and ground waters (i) must be consistent with the maximum benefit to the people of the state, (ii) must not unreasonably affect present and anticipated beneficial use of such water, and (iii) must not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Antidegradation Policy (40 CFR 131.12), developed under the CWA. The USEPA, Region IX, has also issued detailed guidance for the implementation of federal antidegradation regulations for surface waters within its jurisdiction (USEPA, 1987).

Regional Objectives for Inland Surface Waters

Narrative or numerical water quality objectives have been developed for the following parameters (listed alphabetically) and apply to all inland surface waters and enclosed bays and estuaries (including wetlands) in the Region. *Water quality objectives are in italics.*

Ammonia

Ammonia is a pollutant routinely found in the wastewater effluent of Publicly Owned Treatment Works (POTWs), in landfill-leachate, as well as in run-off from agricultural fields where commercial fertilizers and animal manure are applied. Ammonia exists in two forms – un-ionized ammonia (NH_3) and the ammonium ion (NH_4^+). They are both toxic, but the neutral, un-ionized ammonia species (NH_3) is highly toxic to fish and other aquatic life. The ratio of toxic NH_3 to total ammonia ($\text{NH}_4^+ + \text{NH}_3$) is primarily a function of pH, but is also affected by temperature and other factors. Additional impacts can also occur as the oxidation of ammonia lowers the dissolved oxygen content of the water, further stressing aquatic organisms. Ammonia also combines with chlorine (often both are present) to form chloramines - persistent toxic compounds that extend the effects of ammonia and chlorine downstream.

Oxidation of ammonia to nitrate may lead to groundwater impacts in areas of recharge.

The freshwater one-hour average objective is dependent on pH and fish species (salmonids present or absent), but not temperature. It is assumed that salmonids may be present in waters designated in the Basin Plan as "GOLD" or "MIGR" and that salmonids are absent in waters not designated in the Basin Plan as "GOLD" or "MIGR," in the absence of additional information to the contrary. The freshwater 30-day average objective is dependent on pH temperature, and the presence or absence of early life stages of fish (ELS). Implementation of the ELS Provision is described under "Implementation" subparagraph 3. The freshwater four-day average objective is 2.5 times the 30-day average objective.

The objectives for inland surface waters not characteristic of freshwater are based on US EPA Ambient Water Quality Criteria for Ammonia (Saltwater) -1989. Both the one-hour average and 4-day average objectives are fixed concentrations for un-ionized ammonia, independent of pH, temperature, or salinity.

In order to protect aquatic life, ammonia concentrations in inland surface waters characteristic of freshwater ("freshwater" as determined by the provisions described herein under "IMPLEMENTATION," 1. Determination of Freshwater, Brackish Water, or Saltwater Conditions) shall not exceed the values calculated for the appropriate instream conditions shown in Tables 3-1 to 3-3 (per U.S. EPA's most recent criteria guidance document, "1999 Update of Ambient Water Quality Criteria for Ammonia").

For inland surface waters not characteristic of freshwater (as determined by the procedures in paragraph 1 of the Implementation Provisions below), the four-day average concentration of un-ionized ammonia shall not exceed 0.035 mg/L and the one-hour average concentration shall not

exceed 0.233 mg/L.

The water quality objectives for ammonia in freshwater may be revised to reflect local waterbody characteristics using one or more of US EPA's procedures for deriving site-specific objectives (SSOs), which include the water-effect ratio (WER) procedure, recalculation procedure, and resident species procedure. In order to establish SSOs for a waterbody, a study must be conducted that is consistent with US EPA guidelines on deriving aquatic life criteria and SSOs, and the resultant SSOs must be fully approved through the Basin Plan amendment process.

In order to protect underlying groundwater basins, ammonia shall not be present at levels that when oxidized to nitrate, pose a threat to groundwater quality.

Table 3-1. One-hour Average Objective for Ammonia-N for Freshwaters (mg N/L)¹

pH	Waters Designated COLD and/or MIGR	Waters Not Designated COLD and/or MIGR
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

Reference: U.S. EPA 1999 Update of Ambient Water Quality Criteria for Ammonia

¹ For freshwaters, the one-hour average concentration of total ammonia as nitrogen (in mg N/L) shall not exceed the values described by the following equations.

For waters designated COLD and/or MIGR:

$$\text{One-hour Average Concentration} = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

Or for waters not designated COLD and/or MIGR:

$$\text{One-hour Average Concentration} = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

Table 3-2. 30-day Average Objective for Ammonia-N for Freshwaters Applicable to Waters Subject to the “Early Life Present” Condition (mg N/L)

Temperature, °C

pH	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	6.67	6.46	6.06	5.68	5.33	4.99	4.68	4.39	4.12	3.86	3.62	3.39	3.18	2.98	2.80	2.62	2.46
6.6	6.57	6.36	5.97	5.59	5.25	4.92	4.61	4.32	4.05	3.80	3.56	3.34	3.13	2.94	2.75	2.58	2.42
6.7	6.44	6.25	5.86	5.49	5.15	4.83	4.52	4.24	3.98	3.73	3.50	3.28	3.07	2.88	2.70	2.53	2.37
6.8	6.29	6.10	5.72	5.36	5.03	4.72	4.42	4.14	3.89	3.64	3.42	3.20	3.00	2.82	2.64	2.47	2.32
6.9	6.12	5.93	5.56	5.21	4.89	4.58	4.30	4.03	3.78	3.54	3.32	3.11	2.92	2.74	2.57	2.41	2.25
7.0	5.91	5.73	5.37	5.04	4.72	4.43	4.15	3.89	3.65	3.42	3.21	3.01	2.82	2.64	2.48	2.32	2.18
7.1	5.67	5.49	5.15	4.83	4.53	4.25	3.98	3.73	3.50	3.28	3.08	2.88	2.70	2.53	2.38	2.23	2.09
7.2	5.39	5.22	4.90	4.59	4.31	4.04	3.78	3.55	3.33	3.12	2.92	2.74	2.57	2.41	2.26	2.12	1.99
7.3	5.08	4.92	4.61	4.33	4.06	3.80	3.57	3.34	3.13	2.94	2.76	2.58	2.42	2.27	2.13	2.00	1.87
7.4	4.73	4.59	4.30	4.03	3.78	3.55	3.32	3.12	2.92	2.74	2.57	2.41	2.26	2.12	1.98	1.86	1.74
7.5	4.36	4.23	3.97	3.72	3.49	3.27	3.06	2.87	2.69	2.53	2.37	2.22	2.08	1.95	1.83	1.72	1.61
7.6	3.98	3.85	3.61	3.39	3.18	2.98	2.79	2.62	2.45	2.30	2.16	2.02	1.90	1.78	1.67	1.56	1.47
7.7	3.58	3.47	3.25	3.05	2.86	2.68	2.51	2.36	2.21	2.07	1.94	1.82	1.71	1.60	1.50	1.41	1.32
7.8	3.18	3.09	2.89	2.71	2.54	2.38	2.23	2.10	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
7.9	2.80	2.71	2.54	2.38	2.24	2.10	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17	1.10	1.03
8.0	2.43	2.36	2.21	2.07	1.94	1.82	1.71	1.60	1.50	1.41	1.32	1.24	1.16	1.09	1.02	0.957	0.897
8.1	2.10	2.03	1.91	1.79	1.68	1.57	1.47	1.38	1.29	1.21	1.14	1.07	1.00	0.938	0.879	0.824	0.773
8.2	1.79	1.74	1.63	1.53	1.43	1.34	1.26	1.18	1.11	1.04	0.973	0.912	0.855	0.802	0.752	0.705	0.661
8.3	1.52	1.48	1.39	1.30	1.22	1.14	1.07	1.00	0.941	0.882	0.827	0.775	0.727	0.682	0.639	0.599	0.562
8.4	1.29	1.25	1.17	1.10	1.03	0.966	0.906	0.849	0.796	0.747	0.700	0.656	0.615	0.577	0.541	0.507	0.475
8.5	1.09	1.06	0.990	0.928	0.870	0.816	0.765	0.717	0.672	0.630	0.591	0.554	0.520	0.487	0.457	0.428	0.401
8.6	0.920	0.892	0.836	0.784	0.735	0.689	0.646	0.606	0.568	0.532	0.499	0.468	0.439	0.411	0.386	0.362	0.339
8.7	0.778	0.754	0.707	0.663	0.622	0.583	0.547	0.512	0.480	0.450	0.422	0.396	0.371	0.348	0.326	0.306	0.287
8.8	0.661	0.641	0.601	0.563	0.528	0.495	0.464	0.435	0.408	0.383	0.359	0.336	0.315	0.296	0.277	0.260	0.244
8.9	0.565	0.548	0.513	0.481	0.451	0.423	0.397	0.372	0.349	0.327	0.306	0.287	0.269	0.253	0.237	0.222	0.208
9.0	0.486	0.471	0.442	0.414	0.389	0.364	0.342	0.320	0.300	0.281	0.264	0.247	0.232	0.217	0.204	0.191	0.179

* At temperatures below 14 °C, the objective is the same as that shown for 14 °C.
Reference: U.S. EPA 1999 Update of Ambient Water Quality Criteria for Ammonia²

² For freshwaters subject to the “Early Life Stage Present” condition, the thirty-day average concentration of total ammonia as nitrogen (in mg N/L) shall not

exceed the values described by the following equation.

$$\text{30-day Average Concentration} = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) * \text{MIN} \left(2.85, 1.45 * 10^{0.028 * (25 - T)} \right)$$

Where T = temperature expressed in °C.

In addition, for freshwaters, the highest four-day average within the 30-day period shall not exceed 2.5 times the 30-day average objective as calculated above.

Table 3-3. 30-day Average Objective for Ammonia-N for Freshwaters applicable to Waters Subject to the “Early Life Stage Absent” Condition (mg N/L)

pH	Temperature, °C								
	0-7	8	9	10	11	12	13	14	15*
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36
6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641
8.9	0.917	0.86	0.806	0.756	0.709	0.664	0.623	0.584	0.548
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471

* At 15 °C and above, the 30-day average objective for waters subject to the —Early Life Stage Absent” conditions is the same as that for waters subject to the —Early Life Present” condition

Reference: U.S. EPA 1999 Update of Ambient Water Quality Criteria for Ammonia³

³ For freshwaters subject to the “Early Life Stage Absent” condition, the thirty-day average concentration of total ammonia as nitrogen (in mg N/L) shall not exceed the values described by the following equation.

$$\text{30-day Average Concentration} = \left(\frac{0.0577}{1 + 10^{7.688 - \text{pH}}} + \frac{2.487}{1 + 10^{\text{pH} - 7.688}} \right) * 1.45 * 10^{0.028 * (25 - \text{MAX}(T, 7))}$$

Where T = temperature expressed in °C.

In addition, for freshwaters, the highest four-day average within the 30-day period shall not exceed 2.5 times the 30-day average objective as calculated above.

For the following waterbodies, the 30-day average water quality objective for ammonia shall be calculated as set forth below. In addition, the highest four-day average within the 30-day period shall not exceed 2.5 times the 30-day average objective shown in Table 3-4 “Site-specific 30-day Average Objectives for Ammonia by Waterbody Reach”. The regional one-hour average objective for ammonia-N for freshwaters, specified in Table 3-1, remains the applicable one-hour objective for these waterbodies.

Notwithstanding the provisions below, regulatory actions, including but not limited to TMDLs and Waste Discharge Requirements, to achieve applicable site-specific objectives must ensure that downstream standards will also be achieved and downstream beneficial uses will also be protected as far as the discharges’ impacts may be experienced.

As described in “Implementation”, “3. Selection of 30-day Average Objective – Early Life Stage Provision”, below, these waterbodies are subject to site-specific ELS provisions as set forth in Table 3-4 “Site-specific 30-day Average Objectives for Ammonia by Waterbody Reach”, which incorporate seasonality of early life stages of fish.

Where deemed necessary, additional receiving water monitoring shall be required of dischargers subject to SSOs to ensure that the SSOs are as protective of beneficial uses as the regional objectives are intended to be and downstream standards are achieved. This additional monitoring shall be required through the discharger’s NPDES permit monitoring and reporting program or other Board required monitoring programs. If monitoring indicates toxicity due to ammonia or a change in the waterbody that could impact the calculation or application of the SSOs, including either its chemical characteristics or the aquatic species present, including early life stages of fish, the Regional Board may reconsider the SSOs.

Table 3-4. Site-Specific 30-day Average Objectives for Ammonia by Waterbody Reach

WATERBODY	30-DAY AVERAGE OBJECTIVE
Los Angeles River, Reach 5 (Sepulveda Basin)	<p>ELS Present (from April 1 – September 30)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * \text{MIN}(2.85, 2.85 * 10^{0.028 * (25 - T)})$ <p>ELS Absent (from October 1 – March 31)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 2.85 * 10^{0.028 * (25 - \text{Max}(T, 7))}$
Los Angeles River, Reach 4 (Sepulveda Dam to Riverside Drive)	<p>ELS Absent (year round)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 2.85 * 10^{0.028 * (25 - \text{Max}(T, 7))}$
Los Angeles River, Reach 3 (Riverside Drive to Figueroa Street)	<p>ELS Present (from April 1 – September 30)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * \text{MIN}(2.85, 2.85 * 10^{0.028 * (25 - T)})$ <p>ELS Absent (from October 1 – March 31)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 2.85 * 10^{0.028 * (25 - \text{Max}(T, 7))}$
Burbank Western Wash (Burbank Water Reclamation Plant to confluence with LA River)	<p>ELS Absent (year round)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.92 * 2.03 * 10^{0.028 * (25 - \text{Max}(T, 7))}$
San Gabriel River, Reaches 2 and 3 (Confluence with San Jose Creek to Firestone Blvd.) (including all San Jose Creek WRP discharges)	<p>ELS Present (from April 1 – September 30)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.89 * \text{MIN}(2.85, 2.37 * 10^{0.028 * (25 - T)})$ <p>ELS Absent (from October 1 – March 31)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.89 * 2.37 * 10^{0.028 * (25 - \text{Max}(T, 7))}$
San Gabriel River, Reach 1 (Firestone Blvd. to Willow St. or start of estuary)	<p>ELS Absent (year round)</p> $CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 3.34 * 10^{0.028 * (25 - \text{Max}(T, 7))}$

WATERBODY

30-DAY AVERAGE OBJECTIVE

Santa Clara River, Reach 6 (Bouquet Canyon Rd. Bridge to West Pier Hwy 99)

ELS Present (from February 1 – September 30)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * \text{MIN}(2.85, 3.24 * 10^{0.028 * (25 - T)})$$

ELS Absent (from October 1 – January 31)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 3.24 * 10^{0.028 * (25 - \text{Max}(T, 7))}$$

Santa Clara River, Reach 5 (West Pier Hwy 99 to Blue Cut gauging station)

ELS Present (from February 1 – September 30)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * \text{MIN}(2.85, 3.20 * 10^{0.028 * (25 - T)})$$

ELS Absent (from October 1 – January 31)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 3.20 * 10^{0.028 * (25 - \text{Max}(T, 7))}$$

San Jose Creek (Pomona WRP to confluence with San Gabriel River)

ELS Present (from April 1 – September 30)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.92 * \text{MIN}(2.85, 2.02 * 10^{0.028 * (25 - T)})$$

ELS Absent (from October 1 – March 31)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.92 * 2.02 * 10^{0.028 * (25 - \text{Max}(T, 7))}$$

Rio Hondo (Upstream of Whittier Narrows Dam)

ELS Present (from April 1 – September 30)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * \text{MIN}(2.85, 3.04 * 10^{0.028 * (25 - T)})$$

ELS Absent (from October 1 – March 31)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 3.04 * 10^{0.028 * (25 - \text{Max}(T, 7))}$$

Coyote Creek (Long Beach WRP to confluence with San Gabriel River)

ELS Absent (year round)

$$CCC = \left(\frac{0.0676}{1 + 10^{7.688 - pH}} + \frac{2.912}{1 + 10^{pH - 7.688}} \right) * 0.854 * 2.96 * 10^{0.028 * (25 - \text{Max}(T, 7))}$$

IMPLEMENTATION

Implementation Provisions for the Application of Ammonia Objectives to Inland Surface Waters in the Los Angeles Region

1. Determination of Freshwater, Brackish Water or Saltwater Conditions⁴

(1) For inland surface waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the applicable objectives are the freshwater objectives, based on the US EPA "1999 Update of Ambient Water Quality Criteria for Ammonia." (2) For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, the applicable objectives are a 4-day average concentration of 0.035 mg un-ionized NH₃/L and a one-hour average concentration of 0.233 mg un-ionized NH₃/L. (3) For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the freshwater or saltwater objectives. (a) However, the Regional Board may by adoption of a resolution approve the use of either freshwater or saltwater objectives for an enclosed bay, wetland or estuary with findings that scientifically defensible information and data demonstrate that on a site-specific basis the biology of the water body is dominated by freshwater aquatic life and that freshwater objectives are more appropriate; or conversely, the biology of the water body is dominated by saltwater aquatic life and that saltwater objectives are more appropriate. When determining the biotic dominance of a water body, the following factors shall be considered: the nature of the conditions causing the dominance (e.g., natural vs. anthropogenic), the historical conditions of the water body, and the reversibility of the existing conditions.

2. Selection of One-hour Average Objective – Salmonids Present vs. Salmonids Absent

It is assumed that salmonids may be present in waters designated in the Basin Plan as "COLD" or "MIGR" and that salmonids are absent in waters not designated in the Basin Plan as "COLD" or "MIGR," in the absence of additional information to the contrary.

3. Selection of 30-day Average Objective – Early Life Stage (ELS) Provision

Early life stages of fish are presumptively present and must be protected at all times of the year unless the water body is listed in Table 3-5 or unless a site-specific study is conducted, which justifies applying the ELS absent condition or a seasonal ELS present condition. Any change in the implementation provision for the ELS present/absent condition, including the assignment of water bodies, must be approved through the Basin Plan Amendment process.

If recent data and information are submitted to the Regional Board that provide substantial evidence that the physical conditions of a water body listed in Table 3-5 have changed due to restoration efforts such that there is habitat suitable for Early Life Stages of fish and one or more fish species that reproduce below 15 degrees Celsius is known to be present, in that or the adjacent water bodies, the Regional Board shall reconsider this implementation provision to ensure protection of Early Life Stages of fish in the water body.

To justify the ELS absent provision, information regarding fish species distributions, spawning periods, nursery periods and the duration of early life stages found in the water body must be presented. Expert opinions from fisheries biologists and other scientists will be considered. Where it can be obtained, a consensus opinion from a diverse body of experts would carry significant weight in determining the presence or absence of the ELS. Information on water body temperature, including spatial, seasonal and inter-annual variability will also be considered. The determination of the time frame during the year when early life stages are most likely not to be present in numbers that, if chronic toxicity did occur, would affect the long-term success of the fish populations, should include adequate scientific justification. The Regional Board will use the record supporting a Basin Plan amendment as the basis upon which to approve or disapprove changes to these implementation provisions for the 30-day average ammonia objective. The record should clearly explain all the factors and information considered in arriving at the determination. The Regional Board will consider and weigh the breadth and depth of scientific evidence in determining whether to remove the early life stage specification of a water body.

⁴ The procedure described in this section to determine which objectives should be applied is the same method employed in the California Toxics Rule (Title 40, Code of Federal Regulations, § 131.38(c)(3)).

Where there is a site-specific ammonia objective for the water body, and the water body is not identified as ELS absent due to physical characteristics of the water body, separate implementation provisions to protect Early Life Stages of fish may apply, since the temperature threshold at which ELS are more sensitive than invertebrates may change based on these site-specific conditions. The potential for seasonality for all ELS present water bodies will be considered before the ELS provision is applied to water bodies with a site-specific objective.

Notwithstanding anything to the contrary herein, a watershed may have some reaches and tributaries with ELS present conditions and others with ELS absent conditions. Implementation actions to achieve applicable ammonia objectives must implement downstream objectives.

Table 3-5. Water Bodies Subject to 30-day Average Objective Applicable to “ELS Absent” Condition *

HUC 12 No.	Waterbody
CALLEGUAS-CONEJO CREEK WATERSHED	
180701030107	Calleguas Creek Reach 2 (Estuary to Potero Road)
180701030106	Revolon Slough (Calleguas Creek Rch 2 to Pleasant Valley Rd.)
180701030107	Revolon Slough (Pleasant Valley Rd. to Central Ave.)
180701030106	Reach 5 – Beardsley Channel (above Central Ave.)
180701030105	Conejo Creek
180701030107	Arroyo Conejo (Conejo Creek to North Fork Arroyo Conejo)
180701030104	Arroyo Conejo (above confl. with North Fork Arroyo Conejo)
180701030105	Arroyo Las Posas (Calleguas Creek Rch 3 to Long Canyon)
180701030103	Arroyo Las Posas (Long Canyon to Hitch Rd.)
180701030103	Arroyo Simi (Hitch Rd. to Happy Camp Canyon)
180701030102	Arroyo Simi (Happy Camp Canyon to Alamos Canyon)
180701030102	Arroyo Simi (Alamos Canyon to Tapo Canyon Creek)
180701030101	Arroyo Simi (above Tapo Canyon Creek)
MALIBU CREEK WATERSHED	
180701040104	Cold Creek
180701040102	Medea Creek Reach 1 (Malibou Lake to Lindero Creek Reach 1)
180701040102	Medea Creek Reach 2 (above Lindero Creek Reach 1)
180701040104	Triunfo Creek Reach 1 (Malibou Lake to Lobo Canyon)
180701040101	Triunfo Creek Reach 2 (Lobo Canyon to Westlake Lake)
BALLONA CREEK WATERSHED	
180701040300	Ballona Creek Reach 2 (Estuary to National Blvd.)
180701040300	Ballona Creek Reach 1 (above National Blvd.)
DOMINGUEZ CHANNEL WATERSHED	
180701060102	Dominguez Channel (Estuary to 135th St.)
180701060101	Dominguez Channel (above 135th St)
LOS ANGELES RIVER WATERSHED	
180701050402	Los Angeles River Reach 1 (Estuary to Carson St.)
180701050402	Los Angeles River Reach 2 (Carson St. to Rio Hondo Reach 1)
180701050401	Los Angeles River Reach 2 (Rio Hondo Reach 1 to Figueroa St.)

HUC 12 No.	Waterbody
180701050210	Los Angeles River Reach 3 (Figueroa St. to Riverside Dr.)
180701050208	Los Angeles River Reach 4 (Riverside Dr. to Sepulveda Dam)
180701050208	Los Angeles River Reach 5 (Sepulveda Dam to Balboa Blvd.)
180701050208	Los Angeles River Reach 6 (above Balboa Blvd.)
180701050303	Rio Hondo Reach 1 (Los Angeles River Reach 2 to Santa Ana Fwy)
180701050303	Rio Hondo Reach 2 (Santa Ana Fwy to Whittier Narrows Dam)
180701050302	Rio Hondo Reach 3 (except from Whittier Narrows to 4 miles north)
180701050209	Arroyo Seco Reach 3 (above Devils Gate Dam)
180701050208	Tujunga Wash
180701050402	Compton Creek
180701050209	Arroyo Seco Reach 1 (Los Angeles River Reach 2 to Holly St.)
180701050209	Arroyo Seco Reach 2 (Holly St. to Devils Gate Dam)
180701050208	Burbank Western Channel
180701050206	Pacoima Wash
SAN GABRIEL RIVER WATERSHED	
180701060606	San Gabriel River Reach 1 (San Gabriel River Estuary to Firestone Blvd.)
180701060606	San Gabriel River Reach 2 (Firestone Blvd. to Whittier Narrows Dam)
180701060601	San Gabriel River Reach 3 (Whittier Narrows Dam to San Jose Creek)
180701060601	San Gabriel River Reach 3 (San Jose Creek to Ramona Blvd.)
180701060601	San Gabriel River Reach 4 (Ramona Blvd. to Santa Fe Dam)
180701060601	San Gabriel River Reach 5 (Santa Fe Dam to Huntington Dr.)
180701060601	San Gabriel River Reach 5 (Huntington Dr. to Van Tassel Canyon)
180701060506	Coyote Creek (San Gabriel River Estuary to La Cañada Verde Creek)
180701060603	Coyote Creek (above La Cañada Verde Creek)
180701060502	San Jose Creek Reach 1 (San Gabriel River Reach 3 to Temple Ave.)
180701060501	San Jose Creek Reach 2 (Temple Ave. to Thompson Wash)

*Notes:

- 1) All wetlands/estuaries and lagoons are assumed to have ELS.
- 2) Whittier Narrows flood control basin is listed separately in the Basin Plan
- 3) Based on published literature and expert opinion, fish species known to reproduce in significant numbers below 15 degrees Celsius are absent in these water bodies, or the water bodies are known to have physical conditions that preclude reproduction and early development of these species in significant numbers. These species include: steelhead/rainbow trout, three-spine stickleback, brown trout, prickly sculpin, staghorn sculpin, striped mullet, starry flounder, arrow goby, and Pacific lamprey.

4. Existence of Threatened or Endangered Species

Where the Regional Board determines that endangered or threatened species in the Los Angeles Region are more sensitive to a pollutant than the species upon which the objectives are based, more stringent, site-specific

modifications of the objectives shall be performed using U.S. EPA approved methods.⁵ Temperature and pH must be adjusted to match the conditions used to calculate the objectives. Tests to determine site-specific objectives for threatened and endangered species can be conducted in site water or laboratory water.

5. Translation of Objectives into Effluent Limits⁶

If the Regional Board determines that water quality based effluent limitations are necessary to control ammonia in a discharge, the permit shall contain effluent limitations for ammonia using one of the following methods:

1. Use the following procedure based on a steady-state model:

Step 1: Identify the applicable water quality objectives for ammonia for the receiving water immediately downstream of the discharge.

Step 2a: For each water quality objective, calculate the effluent concentration allowance (ECA) using the following steady-state mass balance model:

If a mixing zone has not been authorized by the Regional Board, or when $WQO \leq B$:

$$ECA = WQO$$

If a mixing zone has been authorized by the Regional Board:⁷

$$ECA = WQO + D (WQO - B) \quad \text{when } WQO > B$$

Where: WQO = water quality objective (adjusted as described in Step 2b, if necessary, for temperature, pH, and salinity.)
D = dilution credit
B = ambient background concentration

The dilution credit (D) shall be derived taking into account water body characteristics and the type of discharge (i.e. completely-mixed or incompletely-mixed with the receiving water), using established procedures in the "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (2000) or other appropriate U.S. EPA approved methodologies. The resulting dilution credit must be approved by the Executive Officer.

The ambient background concentration shall be the observed maximum as determined in accordance with procedures in the "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (2000) or other appropriate U.S. EPA approved methodologies. The resulting ambient background concentration must be approved by the Executive Officer.

Step 2b: In order to adjust the un-ionized saltwater ammonia objective to an ECA expressed as total ammonia, the following equation shall be used:

$$[NH_4^+] + [NH_3] = [NH_3] + [NH_3] * 10^{(pK_a^S + 0.0324 (298-T) + 0.0415 P/T - pH)}$$

⁵ U.S. EPA. 1985. "Guidance for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses". U.S. EPA. 1994. "Water Quality Standards Handbook, Second Edition", Chapter 3, Section 3.7.4 "The Recalculation Procedure".

⁶ The method whereby objectives are translated to effluent limits is similar to the method contained in the "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (2000). The method is also consistent with that outlined in the U.S. EPA "Technical Support Document for Water Quality-based Toxics Control (1991).

⁷ Mixing zones may be authorized on a discharge-by-discharge basis per the mixing zone provision in Chapter 4 of the Basin Plan.

Where: $P = 1 \text{ atm}$

$T = \text{temperature } (^{\circ} \text{K})$

$pK_a^s = 0.116 * i + 9.245$, the stoichiometric acid hydrolysis constant of ammonium ions in saltwater based on i

$i = 19.9273 S (1000 - 1.005109 S)^{-1}$, the molal ionic strength of saltwater based on S

$S = \text{salinity}$

(Per U.S. EPA Ambient Water Quality Criteria for Ammonia (Saltwater)-1989)

Step 3: For each ECA calculated in Step 2, determine the long-term average discharge condition (LTA) by multiplying the ECA with a factor (multiplier) that adjusts for effluent variability. The multiplier shall be calculated as described below, or shall be found in Table 3-6. To use Table 3-6, the coefficient of variation (CV)⁸ for the effluent ammonia concentration must first be calculated. If (a) the number of effluent data points is less than 10, or (b) at least 80 percent of the effluent data are reported as not detected, then the CV shall be set equal to 0.6. When calculating the CV in this procedure, if a data point is below the detection limit in an effluent sample, one-half the detection limit shall be used as the value in the calculation. Multipliers for one-hour average, four-day average, and 30-day average objectives for ammonia that correspond to the CV can be found in Table 3-6.

ECA Multipliers:

$$\text{ECA multiplier}_{1\text{-hour}99} = e^{(0.5s^2 - zs)}$$

$$\text{ECA multiplier}_{4\text{-day}99} = e^{(0.5s_4^2 - zs_4)}$$

$$\text{ECA multiplier}_{30\text{-day}99} = e^{(0.5s_{30}^2 - zs_{30})}$$

Where $s = \text{standard deviation}$

$$s = [\ln(CV^2 + 1)]^{0.5}$$

$$s^2 = \ln(CV^2 + 1)$$

$$s_4 = [\ln(CV^2/4 + 1)]^{0.5}$$

$$s_4^2 = \ln(CV^2/4 + 1)$$

$$s_{30} = [\ln(CV^2/30 + 1)]^{0.5}$$

$$s_{30}^2 = \ln(CV^2/30 + 1)$$

$$z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis}$$

LTA Equations:

$$\text{LTA}_{1\text{-hour}99} = \text{ECA}_{1\text{-hour}} * \text{ECA multiplier}_{1\text{-hour}99}$$

$$\text{LTA}_{4\text{-day}99} = \text{ECA}_{4\text{-day}} * \text{ECA multiplier}_{4\text{-day}99}$$

$$\text{LTA}_{30\text{-day}99} = \text{ECA}_{30\text{-day}} * \text{ECA multiplier}_{30\text{-day}99}$$

Step 4: Select the lowest (most limiting) of the LTAs derived in Step 3 (LTA_{min}).

⁸ The coefficient of variation (CV) is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Step 5: Calculate water quality based effluent limitations (a maximum daily effluent limitation, MDEL, and an average monthly effluent limitation, AMEL) by multiplying LTA_{min} (as selected in Step 4) with a factor (multiplier) that adjusts the averaging period and exceedance frequency of the objective, and the effluent monitoring frequency, as follows:

MDEL and AMEL Equations:

$$MDEL = LTA_{min} * MDEL \text{ multiplier}_{99}$$

$$AMEL = LTA_{min} * AMEL \text{ multiplier}_{95}$$

The MDEL and AMEL multipliers shall be calculated as described below, or shall be found in Table 3-7 using the previously calculated CV and monthly sampling frequency (n) of ammonia in the effluent. If the LTA_{min} selected in Step 4 is $LTA_{4\text{-day}99}$ and the sampling frequency is four times per month or less, then n shall be set equal to 4. If the LTA_{min} selected in Step 4 is $LTA_{30\text{-day}99}$ and the sampling frequency is 30 times per month or less, then n shall be set equal to 30.

MDEL and AMEL Multipliers:

$$MDEL \text{ multiplier}_{99} = e^{(zs - 0.5s^2)}$$

Where $z = 2.326$ for 99th percentile probability basis

$$s = [\ln(CV^2 + 1)]^{0.5}$$

$$s^2 = \ln(CV^2 + 1)$$

$$AMEL \text{ multiplier}_{95} = e^{(zs_n - 0.5s_n^2)}$$

Where $z = 1.645$ for 95th percentile probability basis

$$s_n = [\ln(CV^2/n + 1)]^{0.5}$$

$$s_n^2 = \ln(CV^2/n + 1)$$

n = number of samples per month

2. Apply a dynamic model approved by the Regional Board.
3. If a Total Maximum Daily Load (TMDL) for ammonia is in effect, the permit shall contain effluent limitations for ammonia that are based on the waste load allocation for ammonia in the TMDL.

Table 3-6 - Effluent Concentration Allowance (ECA)
 Multipliers for Calculating Long-Term Averages (LTAs)

Coefficient of Variation (CV)	One-hour Multiplier	4-day Multiplier	30-day Multiplier
	99th Percentile Occurrence Probability	99th Percentile Occurrence Probability 4 day	99th Percentile Occurrence Probability 30 day
0.1	0.797	0.891	0.959
0.2	0.643	0.797	0.919
0.3	0.527	0.715	0.882
0.4	0.440	0.643	0.846
0.5	0.373	0.581	0.812
0.6	0.321	0.527	0.78
0.7	0.281	0.481	0.75
0.8	0.249	0.440	0.721
0.9	0.224	0.404	0.693
1.0	0.204	0.373	0.667
1.1	0.187	0.345	0.642
1.2	0.174	0.321	0.619
1.3	0.162	0.300	0.596
1.4	0.153	0.281	0.575
1.5	0.144	0.264	0.555
1.6	0.137	0.249	0.535
1.7	0.131	0.236	0.517
1.8	0.126	0.224	0.5
1.9	0.121	0.214	0.483
2.0	0.117	0.204	0.468
2.1	0.113	0.195	0.453
2.2	0.110	0.187	0.438
2.3	0.107	0.180	0.425
2.4	0.104	0.174	0.412
2.5	0.102	0.168	0.4
2.6	0.100	0.162	0.388
2.7	0.098	0.157	0.377
2.8	0.096	0.153	0.366
2.9	0.094	0.148	0.356
3.0	0.093	0.144	0.346
3.1	0.091	0.141	0.337
3.2	0.090	0.137	0.328
3.3	0.089	0.134	0.32
3.4	0.088	0.131	0.312
3.5	0.087	0.128	0.304
3.6	0.086	0.126	0.297
3.7	0.085	0.123	0.29
3.8	0.084	0.121	0.283
3.9	0.083	0.119	0.277
4.0	0.082	0.117	0.271

Table 3-7 - Long-Term Average (LTA) Multipliers for Calculating Effluent Limitations

Coefficient of Variation	MDEL Multiplier	AMEL Multiplier		
	99th Percentile Occurrence Probability	95th Percentile Occurrence Probability		
(CV)		n=4	n=8	n=30
0.1	1.25	1.08	1.06	1.03
0.2	1.55	1.17	1.12	1.06
0.3	1.90	1.26	1.18	1.09
0.4	2.27	1.36	1.25	1.12
0.5	2.68	1.45	1.31	1.16
0.6	3.11	1.55	1.38	1.19
0.7	3.56	1.65	1.45	1.22
0.8	4.01	1.75	1.52	1.26
0.9	4.46	1.85	1.59	1.29
1.0	4.90	1.95	1.66	1.33
1.1	5.34	2.04	1.73	1.36
1.2	5.76	2.13	1.80	1.39
1.3	6.17	2.23	1.87	1.43
1.4	6.56	2.31	1.94	1.47
1.5	6.93	2.40	2.00	1.50
1.6	7.29	2.48	2.07	1.54
1.7	7.63	2.56	2.14	1.57
1.8	7.95	2.64	2.20	1.61
1.9	8.26	2.71	2.27	1.64
2.0	8.55	2.78	2.33	1.68

6. Receiving Water Compliance Determination

Per Implementation Provision No. 1, the following methods for determining compliance with proposed objectives shall be used:

If salinity sampled at a particular receiving water station indicates saline conditions (equal to or greater than 10 ppt), then saltwater objectives shall apply.

If salinity sampled at a particular receiving water station indicates freshwater conditions (equal to or less than 1 ppt), then freshwater objectives shall apply.

If salinity sampled at a particular receiving water station indicates brackish conditions (greater than 1 but less than 10 ppt), then the more stringent of the freshwater or saltwater objectives shall apply except where the Regional Board, by adoption of a resolution, approves the use of either freshwater or saltwater objectives per Implementation Provision 1(3)(a).

Bacteria, Coliform

Total and fecal coliform bacteria are used to indicate the likelihood of pathogenic bacteria in surface waters. Water quality objectives for total and fecal coliform bacteria vary with the beneficial uses of the waterbody and are described below:

In Marine Waters Designated for Water Contact Recreation (REC-1)

1. Geometric Mean Limits

- a. Total coliform density shall not exceed 1,000/100 ml.
- b. Fecal coliform density shall not exceed 200/100 ml.
- c. Enterococcus density shall not exceed 35/100 ml.

2. Single Sample Limits

- a. Total coliform density shall not exceed 10,000/100 ml.
- b. Fecal coliform density shall not exceed 400/100 ml.
- c. Enterococcus density shall not exceed 104/100 ml.
- d. Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1.

In Fresh Waters Designated for Water Contact Recreation (REC-1)

1. Geometric Mean Limits

- a. *E. coli* density shall not exceed 126/100 ml.

2. Single Sample Limits

- a. *E. coli* density shall not exceed 235/100 ml.

In Fresh Waters Designated for Limited Contact Recreation (LREC-1)

1. Geometric Mean Limits

- a. *E. coli* density shall not exceed 126/100 ml.

2. Single Sample Limits

- a. *E. coli* density shall not exceed 576/100 ml.

The single sample limit for *E. coli* is based on EPA's determination of the most appropriate single sample maximum density for water bodies infrequently used for full-body recreation⁹.

Implementation Provisions for Water Contact Recreation Bacteria Objectives

The geometric mean values should be calculated based on a statistically sufficient number of samples (generally not less than 5 samples equally spaced over a 30-day period).

If any of the single sample limits are exceeded, the Regional Board may require repeat sampling on a daily basis until the sample falls below the single sample limit in order to determine the persistence of the exceedance.

When repeat sampling is required because of an exceedance of any one single sample limit, values from all samples collected during that 30-day period shall be used to calculate the geometric mean.

The single sample bacteriological objectives shall be strictly applied except when provided for in a Total Maximum Daily Load (TMDL). In all circumstances, including in the context of a TMDL, the geometric mean objectives shall be strictly applied. In the context of a TMDL, the Regional Board may implement the single sample objectives in

⁹ U.S. EPA. 1986. *Ambient Water Quality Criteria for Bacteria-1986*. Report No. EPA 330/5-84-002. January 1986.

fresh and marine waters by using a „reference system/antidegradation approach“ or „natural sources exclusion approach“ as discussed below. A reference system is defined as an area and associated monitoring point that is not impacted by human activities that potentially affect bacteria densities in the receiving water body.

These approaches recognize that there are natural sources of bacteria, which may cause or contribute to exceedances of the single sample objectives for bacterial indicators. They also acknowledge that it is not the intent of the Regional Board to require treatment or diversion of natural water bodies or to require treatment of natural sources of bacteria from undeveloped areas. Such requirements, if imposed by the Regional Board, could adversely affect valuable aquatic life and wildlife beneficial uses supported by natural water bodies in the Region.

Under the reference system/antidegradation implementation procedure, a certain frequency of exceedance of the single sample objectives above shall be permitted on the basis of the observed exceedance frequency in the selected reference system or the targeted water body, whichever is less. The reference system/anti-degradation approach ensures that bacteriological water quality is at least as good as that of a reference system and that no degradation of existing bacteriological water quality is permitted where existing bacteriological water quality is better than that of the selected reference system.

Under the natural sources exclusion implementation procedure, after all anthropogenic sources of bacteria have been controlled such that they do not cause or contribute to an exceedance of the single sample objectives and natural sources have been identified and quantified, a certain frequency of exceedance of the single sample objectives shall be permitted based on the residual exceedance frequency in the specific water body. The residual exceedance frequency shall define the background level of exceedance due to natural sources. The „natural sources exclusion“ approach may be used if an appropriate reference system cannot be identified due to unique characteristics of the target water body. These approaches are consistent with the State Antidegradation Policy (State Board Resolution No. 68-16) and with federal antidegradation requirements (40 CFR 131.12).

The appropriateness of these approaches and the specific exceedance frequencies to be permitted under each will be evaluated within the context of TMDL development for a specific water body, at which time the Regional Board may select one of these approaches, if appropriate.

These implementation procedures may only be implemented within the context of a TMDL addressing municipal storm water, including the municipal storm water requirements of the Statewide Permit for Storm Water Discharges from the State of California Department of Transportation (Caltrans), and non-point sources discharges. These implementation provisions do not apply to NPDES discharges other than MS4 discharges.¹⁰

In Waters Designated for Non-contact Water Recreation (REC-2)

In waters designated for non-water contact recreation (REC-2) and not designated for water contact recreation (REC-1), the fecal coliform concentration shall not exceed a log mean of 2000/100 ml (based on a minimum of not less than four samples for any 30-day period), nor shall more than 10 percent of samples collected during any 30-day period exceed 4000/100 ml.

In Waters Designated for Shellfish Harvesting (SHELL)

In all waters where shellfish can be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml, nor shall more than ten percent of the samples collected during any 30-day period exceed 230/100 ml for a five-tube decimal dilution

¹⁰ Municipal storm water discharges in the Los Angeles Region are those with permits under the Municipal Separate Storm Sewer System (MS4) NPDES Program. For example, the MS4 permits at the time of this amendment are the Los Angeles County Municipal Storm Water NPDES Permit, Ventura County Municipal Storm Water NPDES Permit, City of Long Beach Municipal Storm Water NPDES Permit, and elements of the statewide storm water permit for the California Department of Transportation (Caltrans).

test or 330/100 ml when a three-tube decimal dilution test is used.

Bioaccumulation

Many pollutants can bioaccumulate in fish and other aquatic organisms at levels which are harmful for both the organisms as well as organisms that prey upon these species (including humans).

Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels which are harmful to aquatic life or human health.

Biochemical Oxygen Demand (BOD₅)

The 5-day BOD test indirectly measures the amount of readily degradable organic material in water by measuring the residual dissolved oxygen after a period of incubation (usually 5 days at 20 °C), and is primarily used as an indicator of the efficiency of wastewater treatment processes.

Waters shall be free of substances that result in increases in the BOD which adversely affect beneficial uses.

Biostimulatory Substances

Biostimulatory substances include excess nutrients (nitrogen, phosphorus) and other compounds that stimulate aquatic growth. In addition to being aesthetical unpleasant (causing taste, odor, or color problems), this excessive growth can also cause other water quality problems.

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.

Chemical Constituents

Chemical constituents in excessive amounts in drinking water are harmful to human health. Maximum levels of chemical constituents in drinking waters are listed in the California Code of Regulations and the relevant limits are described below.

Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.

Water designated for use as Domestic or Municipal Supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals) and Table 64444-A of Section 64444 (Organic Chemicals). This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Tables 3-8 and 3-9.)

Table 3-8. The Maximum Contaminant Levels: Inorganic Chemicals (for MUN beneficial use) specified in Table 64431-A of Section 64431 of Title 22 of the California Code of Regulations as of February 2013.

Constituent	Maximum Contaminant Level mg/L
Aluminum	1.
Antimony	0.006
Arsenic	0.010
Asbestos	7 MFL*
Barium	1.
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.15
Fluoride	2.0
Mercury	0.002
Nickel	0.1
Nitrate (as NO ₃)	45.
Nitrate + Nitrite (sum as nitrogen)	10.
Nitrite (as nitrogen)	1.
Perchlorate	0.006
Selenium	0.05
Thallium	0.002

(MFL = million fibers per liter; MCL for fibers > 10 microns long)

Chlorine, Total Residual

Disinfection of wastewaters with chlorine produces a chlorine residual. Chlorine and its reaction products are toxic to aquatic life.

Chlorine residual shall not be present in surface water discharges at concentrations that exceed 0.1 mg/L and shall not persist in receiving waters at any concentration that causes impairment of beneficial uses.

Color

Color in water can result from natural conditions (e.g., from plant material or minerals) or can be introduced from commercial or industrial sources. Color is primarily an aesthetic consideration, although extremely dark colored water can limit light penetration and cause additional water quality problems. Furthermore, color can impact domestic and industrial uses by discoloring clothing or foods. The secondary drinking water standard is 15 color units (DHS, 1992).

Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

Exotic Vegetation

Exotic (non-native) vegetation introduced in and around stream courses is often of little value as habitat (food and cover) for aquatic-dependent biota. Exotic plants can quickly out-compete native vegetation and cause other

water quality impairments.

Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects beneficial uses.

Floating Material

Floating materials can be an aesthetic nuisance as well as provide substrate for undesirable bacterial and algal growth and insect vectors.

Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

See additional regulatory guidelines described under the San Gabriel River (East Fork) Trash Total Daily Maximum Load (Chapter 7).

See additional regulatory guidelines described under the Los Angeles River Trash Total Maximum Daily Load (Chapter 7).

See additional regulatory guidelines described under the Ballona Creek Trash Total Maximum Daily Load (Chapter 7).

Table 3-9. The Maximum Contaminant Levels: Organic Chemicals (for MUN beneficial use) specified in Table 64444-A of Section 64444 of Title 22 of the California Code of Regulations as of February 2013

Constituent	Maximum Contaminant Level (mg/L)
(a) Volatile Organic Chemicals (VOCs)	
Benzene	0.001
Carbon Tetrachloride	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylene	0.006
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Ethylbenzene	0.3
Methyl-tert-butyl ether	0.013
Monochlorobenzene	0.07
Styrene	0.1
1,1,1,2-Tetrachloroethane	0.001
Tetrachloroethylene	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.005
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes	1.750*
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)	
Alachlor	0.002
Atrazine	0.001
Bentazon	0.018
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide	0.00005
Constituent	Maximum Contaminant Level (mg/L)

Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.03
Molinate	0.02
Oxamyl	0.05
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4,5-TP (Silvex)	0.05

*MCL is for either a single isomer or the sum of the isomers.

Methylene Blue Activated Substances (MBAS)

The MBAS procedure tests for the presence of anionic surfactants (detergents) in water. Positive results can indicate the presence of domestic wastewater. This test can be used to indicate impacts from septic systems. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life. The secondary drinking water standard for MBAS is 0.5 mg/L (DHS, 1992).

Waters shall not have MBAS concentrations greater than 0.5 mg/L in waters designated MUN.

Mineral Quality

Mineral quality in natural waters is largely determined by the mineral assemblage of soils and rocks and faults near the land surface. Point and nonpoint source discharges of poor quality water can degrade the mineral content of natural waters. High levels of dissolved solids renders waters useless for many beneficial uses. Elevated levels of boron affect agricultural use (especially citrus).

In the late 1980s, many dischargers started to experience compliance problems with chloride limits largely due to chloride levels in supply waters imported into the Region. In order to provide a long-term solution to chloride compliance problems while continuing to protect beneficial uses, the Regional Board adopted Resolution No. 97-002: Policy for Addressing Levels of Chloride in Discharges of Wastewater (Chapter 5). This Chloride Policy revised water quality objectives in selected surface waters based upon chloride levels in supply waters imported into the Region plus a loading factor. The policy also set forth measures to address salinity loading throughout the Region.

Due to concerns expressed about the potential for future adverse impacts to agricultural resources in Ventura County, water quality objectives for chloride in the Santa Clara River and Calleguas Creek watersheds were not revised under the Chloride Policy in 1997. However, the Regional Board granted variances (interim relief) from surface water chloride limits in NPDES permits that are based on existing water quality objectives in the Santa Clara River and Calleguas Creek watersheds. These variances expired in January 2001 and are no longer applicable.

Numerical mineral quality objectives for individual inland surface waters are contained in Table 3-10.

Nitrogen (Nitrate, Nitrite)

High nitrate levels in drinking water can cause health problems in humans. Infants are particularly sensitive and can develop methemoglobinemia (blue-baby syndrome). Excess nitrogen in surface waters also leads to excess aquatic growth and can contribute to elevated levels of NO_3 in ground water as well. The primary drinking water standard for nitrate (as NO_3) is 45 mg/L (DHS, 1992).

Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen ($\text{NO}_3\text{-N} + \text{NO}_2\text{-N}$), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen ($\text{NO}_3\text{-N}$), or 1 mg/L as nitrite-nitrogen ($\text{NO}_2\text{-N}$) or as otherwise designated in Table 3-10.

Oil and Grease

Oil and grease are not readily soluble in water and form a film on the water surface. Oily films can coat birds and aquatic organisms, impacting respiration and thermal regulation, and causing death. Oil and grease can also cause nuisance conditions (odors and taste), are aesthetically unpleasant, and can restrict a wide variety of beneficial uses.

Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.

Oxygen, Dissolved (DO)

Adequate dissolved oxygen levels are required to support aquatic life. Depression of dissolved oxygen can lead to anaerobic conditions resulting in odors or, in extreme cases, in fish kills. Dissolved oxygen requirements are dependent on the beneficial uses of the waterbody.

*At a minimum (see specifics below), the **mean** annual dissolved oxygen concentration of **all** waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.*

The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges.

The dissolved oxygen content of all surface waters designated as COLD shall not be depressed below 6 mg/L as a result of waste discharges.

The dissolved oxygen content of all surface waters designated as both COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.

For that area known as the Outer Harbor area of Los Angeles-Long Beach Harbors, the mean annual dissolved oxygen concentrations shall be 6.0 mg/L or greater, provided that no single determination shall be less than 5.0 mg/L.

Table 3-10. Water Quality Objectives for Selected Constituents in Inland Surface Waters^a.

Reaches are in upstream to downstream order.

WATERSHED/STREAM REACH ^b	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron ^c (mg/L)	Nitrogen ^d (mg/L)	SAR ^e (mg/L)
Miscellaneous Ventura Coastal Streams	<i>no waterbody specific objectives^f</i>					
Ventura River Watershed:						
Above Camino Cielo Road	700	300	50	1.0	5	5
Between Camino Cielo Road and Casitas Vista Road	800	300	60	1.0	5	5
Between Casitas Vista Road and confluence with Weldon Canyon	1000	300	60	1.0	5	5
Between confluence with Weldon Canyon and Main Street	1500	500	300	1.5	10	5
Between Main St. and Ventura River Estuary	<i>no waterbody specific objectives^f</i>					
Santa Clara River Watershed:						
Above Lang gaging station	500	100	50	0.5	5	5
Between Lang gaging station and Bouquet Canyon Road Bridge	800	150	100	1.0	5	5
Between Bouquet Canyon Road Bridge and West Pier Highway 99	1000	300	100	1.5	10	5
Between West Pier Highway 99 and Blue Cut gaging station	1000	400	100	1.5	5	10
Between Blue Cut gaging station and Piru Creek	1300	600	100	1.5	5	5
Between Piru Creek and A Street, Fillmore	1300	600	100	1.5	5	5
Between A Street, Fillmore and Freeman Diversion "Dam" near Saticoy	1300	650	100 ⁱ	1.5	5	5
Between Freeman Diversion "Dam" near Saticoy and Highway 101 Bridge	1200	600	150	1.5	-	-
Between Highway 101 Bridge and Santa Clara River Estuary	<i>no waterbody specific objectives^f</i>					
Santa Paula Creek above Santa Paula Water Works Diversion Dam	600	250	45	1.0	5	5
Sespe Creek above gaging station, 500' downstream from Little Sespe Creek	800	320	60	1.5	5	5
Piru Creek above gaging station below Santa Felicia Dam	800	400	60	1.0	5	5
Calleguas Creek Watershed:						
Arroyo Simi and tributaries-upstream Madera Road	850	250	150	1.0	10	f

Table 3-10. Water Quality Objectives for Selected Constituents in Inland Surface Waters^a (cont.)

Reaches are in upstream to downstream order.

WATERSHED/STREAM REACH^b	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron^c (mg/L)	Nitrogen^d (mg/L)	SAR^e (mg/L)
Arroyo Simi-downstream Madera Road, Arroyo Las Posas, and tributaries	850	250	150	1.0	10	f
Calleguas Creek and tributaries-between Potrero Road and Arroyo Las Posas. Includes Conejo Creek, Arroyo Conejo, and Arroyo Santa Rosa	850	250	150	1.0	10	f
Below Potrero Road	<i>no waterbody specific objectives^f</i>					
Miscellaneous Los Angeles County Coastal Streams	<i>no waterbody specific objectives^f</i>					
Malibu Creek Watershed	2000	500	500	2.0	10	-
Ballona Creek Watershed	<i>no waterbody specific objectives^f</i>					
Dominguez Channel Watershed	<i>no waterbody specific objectives^f</i>					
Los Angeles River Watershed:						
Los Angeles River and tributaries-upstream Sepulveda Flood Control Basin	950	300	150	g	8	g
Los Angeles River-between Sepulveda Flood Control Basin and Figueroa Street. Includes Burbank Western Channel only	950	300	190 ^k	g	8	g
Other tributaries to Los Angeles River-between Sepulveda Flood Control Basin and Figueroa Street	950	300	150	g	8	g
Los Angeles River-between Figueroa Street and Los Angeles River Estuary (Willow Street). Includes Rio Hondo below Santa Ana Freeway only ⁿ .	1500	350	190 ^k	g	8	g
Other tributaries to Los Angeles River-between Figueroa Street and Los Angeles River Estuary. Includes Arroyo Seco downstream spreading grounds.	1500	350	150	g	8	g
Rio Hondo-between Whittier Narrows Flood Control Basin and Santa Ana Freeway	750	300	180 ^k	g	8	g
Rio Hondo-upstream Whittier Narrows Flood Control Basin	750	300	150	g	8	g
Santa Anita Creek above Santa Anita spreading grounds	250	30	10	g	f	g
Eaton Canyon Creek above Eaton Dam	250	30	10	g	f	g
Arroyo Seco above spreading grounds	300	40	15	g	f	g
Big Tujunga Creek above Hansen Dam	350	50	20	g	f	g
Pacoima Awash above Pacoima spreading grounds	250	30	10	g	f	g

Table 3-10. Water Quality Objectives for Selected Constituents in Inland Surface Waters^a (cont.)

Reaches are in upstream to downstream order.

WATERSHED/STREAM REACH ^b	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron ^c (mg/L)	Nitrogen ^d (mg/L)	SAR ^e (mg/L)
San Gabriel River Watershed						
San Gabriel River-Above Morris Dam	250	30	10	0.6	2	2
San Gabriel River-Between Morris Dam and Ramona Blvd.	450	100	100	0.5	8	g
San Gabriel River and tributaries-between Ramona Blvd. and Valley Blvd	750	300	150	1.0	8	g
San Gabriel River-between Valley Blvd and Firestone Blvd. Includes Whittier Narrows Flood Control Basin, and San Jose Creek-downstream 71 Freeway only.	750	300	180 ^k	1.0	8	g
San Jose Creek and tributaries-upstream 71 Freeway.	750	300	150	1.0	8	g
San Gabriel River-Between Firestone Blvd. and San Gabriel River Estuary (downstream from Willow Street) Includes Coyote Creek.	<i>no waterbody specific objectives^f</i>					
All other minor San Gabriel Mountain streams tributary to San Gabriel Valley ^l	300	40	15	g	f	g
Island Watercourses:						
Anacapa Island	<i>no waterbody specific objectives^f</i>					
San Nicolas Island	<i>no waterbody specific objectives^f</i>					
Santa Barbara Island	<i>no waterbody specific objectives^f</i>					
Santa Catalina Island	<i>no waterbody specific objectives^f</i>					
San Clemente Island	<i>no waterbody specific objectives^f</i>					
Other Watercourses:						
San Antonio Creek ^j	225	25	6	--	--	--
Chino Creek ^j	--	--	--	--	--	--

- a. As part of the State's continuing planning process, data will continue to be collected to support the development of numerical water quality objectives for waterbodies and constituents where sufficient information is presently unavailable. Any new recommendations for water quality objectives will be brought before the Regional Board in the future.
- b. All references to watersheds, streams and reaches include all tributaries. Water quality objectives are applied to all waters tributary to those specifically listed in the table. See Figures 2-1 to 2-10 for locations.
- c. Where naturally occurring boron results in concentrations higher than the stated objective, a site-specific objective may be determined on a case-by-case basis.
- d. Nitrate-nitrogen plus nitrite-nitrogen (NO3-N + NO2-N). The lack of adequate nitrogen data for all streams precluded the establishment of numerical objectives for all streams.
- e. Sodium adsorption ratio (SAR) predicts the degree to which irrigation water tends to enter into cation-exchange reactions in soil.

$$SAR = Na+ / ((Ca++ + Mg++) / 2)^{1/2}$$

- f. Site-specific objectives have not been determined for these reaches at this time. These areas are often impaired (by high levels of minerals) and there is not sufficient historic data to designate objectives based on natural background conditions. The following table illustrates the mineral or nutrient quality necessary to protect different categories of beneficial uses and will be used as a guideline for establishing effluent limits in these cases. Protection of the most sensitive beneficial use(s) would be the determining criteria for the selection of effluent limits.

Recommended objective (mg/L)	Beneficial Use Categories				
	MUN (Drinking Water Standards) ¹	PROC	AGR	AQ LIFE*(Frshwtr)	GWR
TDS	500 (USEPA secondary MCL)	50-1500 ^{2,7,9}	450-2000 ^{2,3,6}		Limits based on appropriate groundwater basin objectives and/or beneficial uses
Chloride	250 (USEPA secondary MCL)	20-1000 ^{2,9}	100-355 ^{2,3,8}	230 (4 day ave. continuous conc) ⁴	
Sulfate	400-500 (USEPA proposed MCL)	20-300 ^{2,9}	350-600 ^{2,8}		
Boron			0.5-4.0 ^{2,6,8}		
Nitrogen	10 (USEPA MCL)				

References: 1) USEPA CFR § 141 et seq., 2) McKee and Wolf, 1963, 3) Ayers and Westcot, 1985, 4) USEPA, 1988, 5) Water Pollution Control Federation, 1989, 6) USEPA, 1973, 7) USEPA 1980, 8) Ayers, 1977.

* Aquatic life includes a variety of Beneficial Uses including WARM, COLD, SPWN, MIGR and RARE.

- g. Agricultural supply is not a beneficial use of the surface water in the specified reach.
- h. Rio Hondo spreading grounds are located above the Santa Ana Freeway
- i. The stated objectives apply to all other surface streams originating within the San Gabriel Mountains and extend from their headwaters to the canyon mouth.
- j. These watercourses are primarily located in the Santa Ana Region. The water quality objectives for these streams have been established by Santa Ana Region. Dashed lines indicate that numerical objectives have not been established, however, narrative objectives shall apply. Refer to the Santa Ana Region Basin Plan for more details.
- k. These objectives were updated through a Basin Plan amendment adopted by the Regional Board on January 27, 1997 (Resolution No. R97-02) and went into effect on February 26, 1998.
- l. This objective was updated through a Basin Plan amendment adopted by the Regional Board on November 6, 2003 (Resolution No. R03-015) and went into effect on August 4, 2004.

Table 3-10a. Conditional Site Specific Objectives for Santa Clara River Surface Waters

WATERSHED/STREAM REACH	Chloride (mg/L)
Santa Clara River Watershed:	
Between Bouquet Canyon Road Bridge and West Pier Highway 99	150 (12-month average)
Between West Pier Highway 99 and Blue Cut gaging station	150 (12-month average)
Between Blue Cut gaging station and confluence of Piru Creek	117/130 ^a (3-month average) ^b

- a. The conditional site specific objective of 130 mg/L applies only if the following conditions and implementation requirements are met:
1. Water supply chloride concentrations measured in Castaic Lake are ≥ 80 mg/L.
 2. The Santa Clarita Valley Sanitation District (SCVSD) shall provide supplemental water to salt-sensitive agricultural uses that are irrigated with surface water during periods when Reach 4B (between Blue Cut gaging station and confluence of Piru Creek) surface water exceeds 117 mg/L.
 3. By May 4, 2020, the 10-year cumulative net chloride loading above 117 mg/L ($CNCl_{117}$)ⁱ to Reach 4B of the Santa Clara River (SCR), calculated annually, from the SCVSD Water Reclamation Plants (WRPs) shall be zero or less.

$$^i CNCl_{117} = Cl_{(Above\ 117)} - Cl_{(Below\ 117)} - Cl_{(Export\ Ews)}$$

Where:

$$Cl_{(Above\ 117)} = [WRP\ CI\ Load^1 / Reach\ 4B\ CI\ Load^2] * [Reach\ 4B\ CI\ Load_{>117}^3]$$

$$Cl_{(Below\ 117)} = [WRP\ CI\ Load^1 / Reach\ 4B\ CI\ Load^2] * [Reach\ 4B\ CI\ Load_{\leq 117}^4]$$

$$Cl_{(Export\ EWs)} = CI\ Load\ Removed\ by\ Extraction\ Wells$$

¹ WRP CI Load is determined as the monthly average chloride (Cl) concentration multiplied by the monthly average flow measured at the Valencia WRP.

² Reach 4B CI Load is determined as the monthly average Cl concentration at SCVSD Receiving Water Station RF multiplied by the monthly average flow measured at USGS Gauging Station 11109000 (Las Brisas Bridge).

³ Reach 4B CI Load_{>117} means the calculated Cl load to Reach 4B when monthly average Cl concentration in Reach 4B is above 117 mg/L.

⁴ Reach 4B CI Load_{≤117} means the calculated Cl load to Reach 4B when monthly average Cl concentration in Reach 4B is below or equal to 117 mg/L.

4. The chief engineer of the SCVSD signs under penalty of perjury and submits to the Regional Board a letter documenting the fulfillment of conditions 1, 2, and 3.

- b. The averaging period for the critical condition SSO of 130 mg/L may be reconsidered based on results of chloride trend monitoring after the alternative water resources management (AWRM) system is applied.

The conditional site specific objectives for chloride in the surface water between Bouquet Canyon Road bridge and West Pier Highway 99, between West Pier Highway 99 and Blue Cut gaging station, and between Blue Cut gaging station and confluence of Piru Creek shall apply and supersede the existing water quality objectives in Table 3-10 only when chloride load reductions and/or chloride export projects are in operation by the SCVSD according to the implementation section in Table 7-6.1 of Chapter 7.

Pesticides

Pesticides are used ubiquitously for a variety of purposes; however, their release into the environment presents a hazard to aquatic organisms and plants not targeted for their use. The extent of risk to aquatic life depends on many factors including the physical and chemical properties of the pesticide. Those of greatest concern are those that persist for long periods and accumulate in aquatic life and sediments.

No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the limiting concentrations specified in Table 64444-A of Section 64444 (Organic Chemicals) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-9.)

pH

The hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. While the pH of "pure" water at 25 °C is 7.0, the pH of natural waters is usually slightly basic due to the solubility of carbon dioxide from the atmosphere. Minor changes from natural conditions can harm aquatic life.

The pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge.

The pH of bays or estuaries shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.2 units from natural conditions as a result of waste discharge.

Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are a highly toxic and persistent group of organic chemicals that have been historically released into the environment. Many historic discharges still exist as sources in the environment.

The purposeful discharge of PCBs (the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260) to waters of the Region, or at locations where the waste can subsequently reach waters of the Region, is prohibited.

Pass-through or uncontrollable discharges to waters of the Region, or at locations where the waste can subsequently reach water of the Region, are limited to 70 pg/L (30 day average) for protection of human health and 14 ng/L and 30 ng/L (daily average) to protect aquatic life in inland fresh waters and estuarine waters respectively.

Priority Pollutants

The California Toxics Rule (CTR), located at 40 CFR 131.38, contains federally promulgated water quality criteria applicable to California waters for 126 priority pollutants for the protection of aquatic life and human health.

Implementation Provisions

The water quality criteria for metals contained in the CTR are expressed as a function of a water-effect ratio (WER).¹¹ In the CTR, the US EPA has provided for the adjustment of these water quality criteria through the application by States of the WER procedure. The WER has a default value of 1.0 unless a site-specific WER is approved by the Regional Board. To use a WER other than the default of 1.0, a study must be conducted, establishing the ratio that represents the difference between toxicity in laboratory test water and toxicity in a specific water body based on ambient conditions. The study must be consistent with US EPA procedures on deriving WERs.

Notwithstanding the provisions below, regulatory actions to achieve applicable criteria, as modified by site-specific WERs, must ensure that downstream standards will also be achieved.

Additional receiving water monitoring shall be required of dischargers subject to site-specific WER(s) to evaluate whether criteria, as modified by the WER(s), are as protective of beneficial uses as the CTR criteria are intended to be. If additional monitoring indicates a change in the chemical characteristics of the water body or toxicity, the Regional Board may reconsider the site-specific WER(s).

Copper

For the following water bodies, the copper water quality criteria contained in the CTR shall be modified using the site-specific WERs set forth below.

Table 3-11 Site-specific Water-Effect Ratios for Copper

Waterbody Name	Reach Name	Description of Reach/Area	Water-Effect Ratio
Mugu Lagoon	Reach 1	Lagoon fed by Calleguas Creek	1.51
Lower Calleguas Creek	Reach 2	Downstream (south) of Potrero Road to the lagoon	3.69

Radioactive Substances

Radioactive substances are generally present in natural waters in extremely low concentrations. Mining or industrial activities increase the amount of radioactive substances in waters to levels that are harmful to aquatic life, wildlife or humans.

Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in Table 64442 of Section 64442 (Gross Alpha Particle Activity, Radium-226, Radium-228, and Uranium) and Table 64443 of Section 64443 (Beta Particle and Photon Radioactivity) of Title 22 of the California Code of Regulations which are incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-12a and 3-12b.)

¹¹ There are two exceptions where the criteria are not a function of a WER. The freshwater criteria for selenium are not a function of a WER. The freshwater and saltwater criteria for mercury are not a function of a WER.

Table: 3-12a. The Maximum Contaminant Levels (MCLs) and Detection Levels for Purposes of Reporting (DLRs): Gross Alpha Particle Activity, Radium-226, Radium-228, and Uranium (for MUN beneficial use) specified in Table 64442 of Section 64442 of Title 22 of the California Code of Regulations as of February 2013

Radionuclide	MCL (pCi/L)	DLR (pCi/L)
Radium-226 Radium-228	5 (combined radium-226 & -228)	1 1
Gross Alpha particle activity (excluding radon and uranium)	15	3
Uranium	20	1

Table: 3-12b. The Maximum Contaminant Levels (MCLs) and Detection Levels for Purposes of Reporting (DLRs): Beta particles and Photon Radioactivity (for MUN beneficial use) specified in Table 64443 of Section 64443 of Title 22 of the California Code of Regulations as of February 2013

Radionuclide	MCL	DLR (pCi/L)
Beta/photon emitters	4 millirem/year annual dose equivalent to the total body or any internal organ	Gross Beta particle activity: 4pCi/L
Strontium - 90	8 pCi/L (= 4 millirem/yr dose to bone marrow)	2 pCi/L
Tritium	20,000 pCi/L (= 4 millirem/yr dose to total body)	1,000 pCi/L

Solid, Suspended, or Settleable Materials

Surface waters carry various amounts of suspended and settleable materials from both natural and human sources. Suspended sediments limit the passage of sunlight into waters, which in turn inhibits the growth of aquatic plants. Excessive deposition of sediments can destroy spawning habitat, blanket benthic (bottom dwelling) organisms, and abrade the gills of larval fish.

Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.

See additional regulatory guidelines described under the Los Angeles River Trash Total Maximum Daily Load (Chapter 7).

See additional regulatory guidelines described under the Ballona Creek Trash Total Maximum Daily Load (Chapter 7).

Taste and Odor

Undesirable tastes and odors in water are an aesthetic nuisance, can impact recreational and other uses, and can indicate the presence of other pollutants.

Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance, or adversely affect beneficial uses.

Temperature

Discharges of wastewaters can cause unnatural and/or rapid changes in the temperature of receiving waters which can adversely affect aquatic life.

The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial

uses. Alterations that are allowed must meet the requirements below.

For waters designated WARM, water temperature shall not be altered by more than 5 °F above the natural temperature. At no time shall these WARM-designated waters be raised above 80 °F as a result of waste discharges.

For waters designated COLD, water temperature shall not be altered by more than 5 °F above the natural temperature.

Temperature objectives for enclosed bays and estuaries are specified in the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California" (Thermal Plan), including any revisions thereto. See Chapter 5 for a description of the Thermal Plan.

Toxicity

Toxicity is the adverse response of organisms to chemical or physical agents. When the adverse response is mortality, the result is termed acute toxicity. When the adverse response is not mortality but instead reduced growth in larval organisms or reduced reproduction in adult organisms (or other appropriate measurements), a critical life stage effect (chronic toxicity) has occurred. The use of aquatic bioassays (toxicity tests) is widely accepted as a valid approach to evaluating toxicity of waste and receiving waters.

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board.

The survival of aquatic life in surface waters, subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same waterbody in areas unaffected by the waste discharge or, when necessary, other control water.

There shall be no acute toxicity in ambient waters, including mixing zones. The acute toxicity objective for discharges dictates that the average survival in undiluted effluent for any three consecutive 96-hour static or continuous flow bioassay tests shall be at least 90%, with no single test having less than 70% survival when using an established USEPA, State Board, or other protocol authorized by the Regional Board.

There shall be no chronic toxicity in ambient waters outside mixing zones. To determine compliance with this objective, critical life stage tests for at least three species with approved testing protocols shall be used to screen for the most sensitive species. The test species used for screening shall include a vertebrate, an invertebrate, and an aquatic plant. The most sensitive species shall then be used for routine monitoring. Typical endpoints for chronic toxicity tests include hatchability, gross morphological abnormalities, survival, growth, and reproduction.

Effluent limits for specific toxicants can be established by the Regional Board to control toxicity identified under Toxicity Identification Evaluations (TIEs).

Turbidity

Turbidity is an expression of the optical property that causes light to be scattered in water due to particulate matter such as clay, silt, organic matter, and microscopic organisms. Turbidity can result in a variety of water quality impairments. The secondary drinking water standard for turbidity is 5 NTU (nephelometric turbidity units).

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits:

Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%.

Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.

Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Waste Discharge Requirements.

Regional Narrative Objectives for Wetlands

In addition to the regional objectives for inland surface waters (including wetlands), the following narrative objectives apply for the protection of wetlands in the Region.

Hydrology

Natural hydrologic conditions necessary to support the physical, chemical, and biological characteristics present in wetlands shall be protected to prevent significant adverse effects on:

- *natural temperature, pH, dissolved oxygen, and other natural physical/chemical conditions,*
- *movement of aquatic fauna,*
- *survival and reproduction of aquatic flora and fauna, and*
- *water levels.*

Habitat

Existing habitats and associated populations of wetlands fauna and flora shall be maintained by:

- *maintaining substrate characteristics necessary to support flora and fauna which would be present naturally,*
- *protecting food supplies for fish and wildlife,*
- *protecting reproductive and nursery areas, and*
- *protecting wildlife corridors.*

Regional Objectives for Ground Waters

The following objectives apply to all ground waters of the Region:

Bacteria

Total and fecal coliform bacteria are used to indicate the likelihood of pathogenic bacteria in waters.

In ground waters used for domestic or municipal supply (MUN) the concentration of coliform organisms over any seven day period shall be less than 1.1/100 ml.

Chemical Constituents and Radioactivity

Chemical constituents in excessive amounts in drinking water are harmful to human health. Maximum levels of chemical constituents in drinking waters are listed in the California Code of Regulations and the relevant limits are described below.

Ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents and radionuclides in excess of the limits specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section

64431 (Inorganic chemicals), Table 64444-A of Section 64444 (Organic Chemicals), Table 64442 of Section 64442 (Gross Alpha Particle Activity, Radium-226, Radium-228, and Uranium), and Table 64443 of Section 64443 (Beta Particle and Photon Radioactivity). This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Tables 3-8, 3-9, 3-12a, and 3-12b.)

Ground waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.

Mineral Quality

Inorganic constituents in ground waters are largely influenced by thermodynamic reactions that occur as ground water comes into contact with various rock and soil types. For example, ground water that flows through beds of gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) typically has relatively high levels of calcium cations and sulfate anions. Ground water flowing through limestone (CaCO_3) also has relatively high levels of calcium cations, but coupled with bicarbonate anions instead of sulfate. Ground waters with these ions at levels greater than 120 mg/L (expressed as CaCO_3) are considered hard waters (Hem, 1989).

Human activities and land use practices can influence inorganic constituents in ground waters. Surface waters carrying abnormally high levels of salts (e.g., irrigation return flows) can degrade the ground waters that they recharge. Abnormally high levels of inorganic constituents can impair and preclude beneficial uses. For example, high levels of boron preclude agricultural use (especially for citrus crops) of ground waters. Hard waters present nuisance problems and may require softening prior to industrial use.

Numerical mineral quality objectives for individual groundwater basins are contained in Table 3-13.

Coastal Aquifer Variance Provision for Mineral Quality Objectives

In coastal aquifers where elevated concentrations of minerals are caused by natural sources due to an aquifer's proximity to the ocean, the Regional Board may grant a variance from implementing the mineral quality objectives specified in Table 3-13 when issuing waste discharge requirements (WDRs) or enforcement orders. Any variance granted pursuant to this variance provision shall be for no more than five years, and may be extended not more than once for an additional period of up to five years. Any further relief should be in the form of a Basin Plan amendment. A decision to issue or to extend a variance will be based upon the Regional Board's evaluation of the evidence submitted concerning the granting of the variance.

A discharger must submit to the Executive Officer a written request for a variance from compliance with the mineral quality objectives for groundwater. The request must include recent data and analysis that provide clear and convincing evidence that elevated mineral concentrations are natural in origin and result from the aquifer's proximity to the ocean. The discharger's request must include clear and convincing evidence and analysis that:

1. The aquifer's proximity to the ocean leads to one or more of the following:
 - a) seawater intrusion;
 - b) the presence of marine sediments high in mineral content;
 - c) tidal fluctuations that regularly influence the chemistry of the aquifer.
2. The source of the elevated mineral concentrations is natural and not induced by current or past discharge of pollutants.
3. A discharge of minerals in excess of the mineral quality objectives in the coastal aquifer will not degrade adjacent, inland aquifers.
4. The discharger has not caused or significantly contributed to the elevated Mineral concentrations from which it seeks relief.

The Regional Board may only grant a variance after a duly noticed public meeting. The Regional Board's decision to grant or to deny a variance shall be based on the record, including the discharger's request, the circumstances leading to the elevated mineral concentrations at the site, and the comments of staff and interested persons. The Regional Board may only grant a variance upon the Regional Board's determination that the request satisfies the

conditions specified above and that the variance is in the public interest. In granting a variance, the Regional Board must include appropriate requirements in the WDRs or enforcement order consistent with the State Water Resources Control Board's anti-degradation resolution (SWRCB Res. No. 68-16) and other applicable water quality standards as stipulated in regional and statewide water quality control plans.

Nitrogen (Nitrate, Nitrite)

High nitrate levels in drinking water can cause health problems in humans. Infants are particularly sensitive and can develop methemoglobinemia (blue-baby syndrome). The primary drinking water standard for nitrate (as NO_3) is 45 mg/L (DHS, 1992).

Human activities and land use practices can also influence nitrogen concentration in ground waters. For example, effluents from wastewater treatment plants, septic tanks and confined animal facilities can add high levels of nitrogen compounds to the ground water that they recharge. Irrigation water containing fertilizers can add high levels of nitrogen to ground water.

Ground waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen ($\text{NO}_3\text{-N} + \text{NO}_2\text{-N}$), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen ($\text{NO}_3\text{-N}$), or 1 mg/L as nitrite-nitrogen ($\text{NO}_2\text{-N}$).

Taste and Odor

Undesirable tastes and odors in water are an aesthetic nuisance and can indicate the presence of other pollutants.

Ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

Table 3-13. Water Quality Objectives for Selected Constituents in Regional Ground Waters^a.

BASINS			Objectives (mg/l) ^m				
Basin	Basin No ^b	1994 Basin Name	1994 Basin No	TDS	Sulfate	Chloride	Boron
Pitas Point Area^c		Pitas Point Area		None specified			
Upper Ojai Valley	4-1	Ojai Valley	4-1				
Upper Ojai Valley	4-1	Upper Ojai Valley	4-1				
Upper Ojai Valley	4-1	West of Sulfur Mountain Road	4-1	1000	300	200	1.0
Upper Ojai Valley	4-1	Central Area	4-1	700	50	100	1.0
Upper Ojai Valley	4-1	Sisar Area	4-1	700	250	100	0.5
Ojai Valley	4-2	Lower Ojai Valley	4-2				0.5
Ojai Valley	4-2	West of San Antonio-Senior Canyon	4-2	1000	300	200	0.5
Ojai Valley	4-2	East of San Antonio-Senior Canyon	4-2	700	200	50	
Ventura River Valley	4-3	Ventura River Valley	4-3				
Upper Ventura River	4-3.01	Upper Ventura	4-3	800	300	100	0.5
Upper Ventura River	4-3.01	San Antonio Creek Area	4-3	1000	300	100	1.0
Lower Ventura River	4-3.02	Lower Ventura	4-3	1500	500	30	1.5
Santa Clara River Valley^d	4-4	Ventura Central	4-4				
Piru	4-4.06	Santa Clara-Piru Creek Area	4-4				
Piru	4-4.06	Upper Area (above Lake Piru)	4-4	1100	400	200	2.0
Piru	4-4.06	Lower Area East of Piru Creek	4-4	2500	1200	200	1.5
Piru	4-4.06	Lower Area West of Piru Creek	4-4	1200	600	100	1.5
Fillmore	4-4.05	Santa Clara-Sespe Creek Area	4-4				
Fillmore	4-4.05	Topa Topa (upper Sespe) Area	4-4	900	350	30	2.0
Fillmore	4-4.05	Fillmore Area	4-4				
Fillmore	4-4.05	Pole Creek Fan Area	4-4	2000	800	100	1.0
Fillmore	4-4.05	South Side of Santa Clara River	4-4	1500	800	100	1.1
Fillmore	4-4.05	Remaining Fillmore Area	4-4	1000	400	50	0.7
Santa Paula	4-4.04	Santa Clara-Santa Paula Area	4-4				
Santa Paula	4-4.04	East of Peck Road	4-4	1200	600	100	1.0

BASINS			Objectives (mg/l) ^m				
Basin	Basin No ^b	1994 Basin Name	1994 Basin No	TDS	Sulfate	Chloride	Boron
Santa Paula	4-4.04	West of Peck Road	4-4	2000	800	110	1.0
Mound	4-4.03	Oxnard Plain	4-4				
Mound	4-4.03	Confined Aquifers	4-4	1200	600	150	1.0
Mound	4-4.03	Unconfined & Perched Aquifers	4-4	3000	1000	500	
Oxnard	4-4.02	Oxnard Plain	4-4				
Oxnard	4-4.02	Oxnard Forebay	4-4	1200	600	150	1.0
Oxnard	4-4.02	Confined Aquifers	4-4	1200	600	150	1.0
Oxnard	4-4.02	Unconfined & Perched Aquifers		3000	1000	500	
Pleasant Valley^c	4-6	Pleasant Valley	4-6				
Pleasant Valley	4-6	Confined Aquifers	4-6	700	300	150	1.0
Pleasant Valley	4-6	Unconfined & Perched Aquifers	4-6				
Arroyo Santa Rosa Valley^c	4-7	Arroyo Santa Rosa	4-7	900	300	150	1.0
Las Posas Valley^c	4-8	Las Posas Valley	4-8				
Las Posas Valley	4-8	South Las Posas Area	4-8				
Las Posas Valley	4-8	NW of Grimes Cyn Rd. & LA Ave. & Somis Rd.	4-8	700	300	100	0.5
Las Posas Valley	4-8	E of Grimes Cyn Rd & Hitch Blvd.	4-8	2500	1200	400	3.0
Las Posas Valley	4-8	S of LA Ave Between Somis Rd & Hitch Blvd.	4-8	1500	700	250	1.0
Las Posas Valley	4-8	Grimes Canyon Rd. & Broadway Area	4-8	250	30	30	0.2
Las Posas Valley	4-8	North Las Posas Area	4-8	500	250	150	1.0
Acton Valley^f	4-5	Upper Santa Clara	4-5				
Acton Valley	4-5	Acton Valley	4-5	550	150	100	1.0
Acton Valley	4-5	Sierra Pelona Valley (Agua Dulce)	4-5	600	100	100	0.5
Acton Valley	4-5	Upper Mint Canyon	4-5	700	150	100	0.5
Acton Valley	4-5	Upper Bouquet Canyon	4-5	400	50	30	0.5
Acton Valley	4-5	Green Valley	4-5	400	50	25	
Acton Valley	4-5	Lake Elizabeth-Lake Hughes Area	4-5	500	100	50	0.5

BASINS			Objectives (mg/l) ^m				
Basin	Basin No ^b	1994 Basin Name	1994 Basin No	TDS	Sulfate	Chloride	Boron
Santa Clara River Valley East	4-4.07	Eastern Santa Clara	4-4.07				
Santa Clara River Valley East	4-4.07	Santa Clara-Mint Canyon	4-4.07	800	150	150	1.0
Santa Clara River Valley East	4-4.07	South Fork	4-4.07	700	200	100	0.5
Santa Clara River Valley East	4-4.07	Placentia Canyon	4-4.07	700	150	100	0.5
Santa Clara River Valley East	4-4.07	Santa Clara-Bouquet & San Fransisquito Canyons	4-4.07	700	250	100	1.0
Santa Clara River Valley East	4-4.07	Castaic Valley	4-4.07	1000	350	150	1.0
Santa Clara River Valley East	4-4.07	Saugus Aquifer	4-4.07				
Simi Valley	4-9	Simi Valley	4-9				
Simi Valley	4-9	Simi Valley Basin	4-9				
Simi Valley	4-10	Confined Aquifers	4-9	1200	600	150	1.0
Simi Valley	4-11	Unconfined & Perched Aquifers	4-9				
Simi Valley	4-12	Gillibrand Basin	4-9	900	350	50	1.0
Conejo Valley	4-10	Conejo Valley	4-10	800	250	150	1.0
Coastal Plain of Los Angeles	4-11	Los Angeles Coastal Plain	4-11				
Central	4-11.04	Central Basin	4-11	700	250	150	1.0
West Coast	4-11.03	West Coast Basin	4-11	800	250	250	1.5
Hollywood	4-11.02	Hollywood Basin	4-11	750	100	100	1.0
Santa Monica	4-11.01	Santa Monica Basin	4-11	1000	250	200	0.5
San Fernando Valley	4-12	San Fernando Valley	4-12				
San Fernando Valley	4-12	Sylmar Basin	4-12	600	150	100	0.5
San Fernando Valley	4-12	Verdugo Basin	4-12	600	150	100	0.5
San Fernando Valley	4-12	San Fernando Basin	4-12				
San Fernando Valley	4-12	West of Highway 405	4-12	800	300	100	1.5
San Fernando Valley	4-12	East of Highway 405 (overall)	4-12	700	300	100	1.5

BASINS			Objectives (mg/l) ^m				
Basin	Basin No ^b	1994 Basin Name	1994 Basin No	TDS	Sulfate	Chloride	Boron
San Fernando Valley	4-12	Sunland-Tujunga Area	4-12	400	50	50	0.5
San Fernando Valley	4-12	Foothill Area	4-12	400	100	50	1.0
San Fernando Valley	4-12	Area Encompassing RT-Tujunga -Erwin-N. Hollywood-Whithall-LA/Verdugo-Crystal Springs-Headworks-Glendale/Burbank Well Fields	4-12	600	250	100	1.5
San Fernando Valley	4-12	Narrows Area (below confluence of Verdugo Wash with the LA River)	4-12	900	300	150	1.5
San Fernando Valley	4-12	Eagle Rock Basin	4-12	800	150	100	0.5
San Gabriel Valley^g/Raymond^h	4-13	San Gabriel Valley	4-13				
Raymond	4-23	Raymond Basin	4-13				
Raymond	4-23	Monk Hill Sub-Basin	4-13	450	100	100	0.5
Raymond	4-23	Santa Anita Area	4-13	450	100	100	0.5
Raymond	4-23	Pasadena Area	4-13	450	100	100	0.5
San Gabriel Valley	4-13	Main San Gabriel Basin	4-13				
San Gabriel Valley	4-13	Western Area ^g	4-13	450	100	100	0.5
San Gabriel Valley	4-13	Eastern Area ^g	4-13	600	100	100	0.5
San Gabriel Valley	4-13	Puente Basin	4-13	1000	300	150	1.0
Upper Santa Ana Valley/San Gabriel Valley	8-2.01ⁱ	Upper Santa Ana Valley	4-14				
San Gabriel Valley	4-13	Live Oak Area	8-2	450	150	100	0.5
San Gabriel Valley	4-13	Claremont Heights Area	8-2	450	100	50	
San Gabriel Valley	4-13	Pomona Area	8-2	300	100	50	0.5
Upper Santa Ana Valley/ San Gabriel Valley	8-2.01/4-13	Chino Area	8-2	450	20	15	
San Gabriel Valley	4-13	Spadra Area	8-2	550	200	120	1.0
Tierra Rejada	4-15	Tierra Rejada	4-15	700	250	100	0.5
Hidden Valley	4-16	Hidden Valley	4-16	1000	250	250	1.0

BASINS			Objectives (mg/l) ^m				
Basin	Basin No ^b	1994 Basin Name	1994 Basin No	TDS	Sulfate	Chloride	Boron
Lockwood Valley	4-17	Lockwood Valley	4-17	1000	300	20	2.0
Hungry Valley	4-18	Hungry Valley & Peace Valley	4-18	500	150	50	1.0
Conejo Valley	4-10	Thousand Oaks Area	4-19	1400	700	150	1.0
Russell Valley	4-20	Russell Valley	4-20				
Russell Valley	4-20	Russell Valley	4-20	1500	500	250	1.0
Thousand Oaks Area	4-19	Triunfo Canyon Area	4-20	2000	500	500	2.0
Thousand Oaks Area	4-20	Lindero Canyon Area	4-20	2000	500	500	2.0
Thousand Oaks Area	4-21	Las Virgenes Canyon Area	4-20	2000	500	500	2.0
Conejo-Tierra Rejada Volcanic Area^l	No DWR#	Conejo-Tierra Rejada Volcanic Area	4-21				
Malibu Valley	4-22	Santa Monica Mountains-Southern Slopes^k	4-22				
Malibu Valley	No DWR#	Camarillo Area		1000	250	250	1.0
Malibu Valley	No DWR#	Point Dume Area		1000	250	250	1.0
Malibu Valley	4-22	Malibu Valley	4-22	2000	500	500	2.0
Malibu Valley	No DWR#	Topanga Canyon Area		2000	500	500	2.0
San Pedro Channel Islands^l	No DWR#	San Pedro Channel Islands					
Anacapa Island	No DWR#	Anacapa Island	No DWR#				
San Nicholas Island	No DWR#	San Nicholas Island	No DWR#	1100	150	350	
Santa Catalina Island	No DWR#	Santa Catalina Island	No DWR#	1000	100	250	1.0
San Clemente Island	No DWR#	San Clemente Island	No DWR#				
Santa Barbara	No DWR#	Santa Barbara Island	No DWR#				

- a. Objectives for ground waters outside of the major basins listed on this table and outlined in Figure 1-9 have not been specifically listed. However, ground waters outside of the major basins are, in many cases, significant sources of water. Furthermore, ground waters outside of the major basins are either potential or existing sources of water for downgradient basins and, as such, objectives in the downgradient basins shall apply to these areas.
- b. Basins are numbered according to Bulletin 118-Update 2003 (Department of Water Resources, 2003).
- c. Ground waters in the Pitas Point area (between the lower Ventura River and Rincon Point) are not considered to comprise a major basin, and accordingly have not been designated a basin number by the California Department of Water Resources (DWR) or outlined on Figure 1-9.
- d. The Santa Clara River Valley (4-4) was formerly Ventura Central Basin

- e. Pleasant Valley (4-6), Arroyo Santa Rosa Valley (4-7) and Las Posas Valley (4-8) Ground Water Basins were former sub-basins of the Ventura Central Basin (DWR, 1980).
- f. Acton Valley Basin was formerly Upper Santa Clara Basin (DWR, 1980)
- g. San Gabriel Valley is a combination of what were formerly the Western and Eastern areas of the Main San Gabriel Basin, and the Puente Basin. All of the groundwater in the former Main San Gabriel Basin is covered by the objectives listed under Main San Gabriel Basin – Eastern Area and Western Area. Walnut Creek, Big Dalton Wash, and Little Dalton Wash separate the Eastern Area from the Western Area (see the dashed line on Figure A2-17 in Appendix II). Any ground water upgradient of these areas is subject to downgradient beneficial uses and objectives, as explained in Footnote a.
- h. Raymond Basin was formerly a sub-basin of the San Gabriel Valley and is now a separate basin.
- i. The border between Regions 4 and 8 crosses the Upper Santa Ana Valley and San Gabriel Valley Ground Water Basins.
- j. Ground water in the Conejo-Tierra Rejada Volcanic Area occurs primarily in fractured volcanic rocks in the western Santa Monica Mountains and Conejo Mountain areas. These areas have not been delineated on Figure 1-9.
- k. With the exception of ground water in Malibu Valley (DWR Basin No. 4-22), ground waters along the southern slopes of the Santa Monica Mountains are not considered to comprise a major basin and accordingly have not been designated a basin number by the California Department of Water Resources (DWR) or outlined on Figure 1-9.
- l. DWR has not designated basins for ground waters on the San Pedro Channel Islands
- m. The Regional Board may grant, at its sole discretion, individual dischargers a variance from the numeric mineral quality objectives for groundwater specified in Table 3-13 under the conditions and procedures specified in —~~Costal~~ Aquifer Variance Provision for Mineral Quality Objectives” set forth in the Regional Objectives for Ground Waters.

Table 3-13a. Conditional Site Specific Objectives for Selected Constituents in Regional Groundwaters

DWR Basin No.	BASIN	Chloride (mg/L)
4-4	Santa Clara River Valley Lower area east of Piru Creek ¹	150 (rolling 12-month average)
4-4.07	Santa Clara River Valley East Santa Clara—Bouquet & San Francisquito Canyons Castaic Valley	150 (rolling 12-month average) 150 (rolling 12-month average)

1. This objective only applies to the San Pedro formation. Existing objective of 200 mg/L applies to shallow alluvium layer above San Pedro formation.

The conditional site specific objectives for chloride in the groundwater in Santa Clara--Bouquet & San Francisquito Canyons, Castaic Valley, and the lower area east of Piru Creek (San Pedro Formation) shall apply and supersede the existing regional groundwater quality objectives only when chloride load reductions and/or chloride export projects are in operation by the SCVSD according to the implementation section in Table 7-6.1 of Chapter 7.

Statewide Objectives for Ocean Waters

The State Board's *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan), *Water Quality Control Plan for Enclosed Bays and Estuaries of California*, and the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) and any revision thereto, shall also apply to all ocean waters of the Region. These plans are described in Chapter 5, Plans and Policies. Copies of these plans can be obtained at the Office of Legislative and Public Affairs (OLPA) in Sacramento or at the Regional Board office.

Site Specific Objectives

While many pollutants are regulated under federal, state or regionally applied water quality standards, the Regional Board supports the idea of developing site-specific objectives (SSOs) in appropriate circumstances. Site-specific, or reach-specific, objectives are already in place for some parameters (i.e., mineral quality). These were established to protect a specific beneficial use or were based on antidegradation policies. The development of site-specific objectives requires complex and resource intensive studies; resources will limit the number of studies that will be performed in any given year. In addition, a Use Attainability Analysis (UAA) study will be necessary if the attainment of designated aquatic life or recreational beneficial uses is in question. UAAs include waterbody surveys and assessments which define existing uses, determine appropriateness of the existing and designated uses, and project potential uses by examining the waterbody's physical, chemical, and biological characteristics. Under certain conditions, a designated use may be changed if attaining that use would result in substantial and widespread economic and social impacts. Uses that have been attained cannot be removed under a UAA analysis. If a UAA study is necessary, that study must be completed before a SSO can be determined. Early planning and coordination with Regional Board staff will be critical to the development of a successful plan for developing SSOs.

Site-specific objectives must be based on sound scientific data in order to assure protection of beneficial uses. There may be several acceptable methods for developing site-specific objectives. A detailed workplan will be developed with Regional Board staff and other agencies (if appropriate) based on the specific pollutant and site involved. State Board staff and the USEPA will participate in the development of the studies so that there is

agreement on the process from the beginning of the study.

Although each study will be unique, there are several elements that should be addressed in order to justify the need for a site-specific objective. These may include, but are not limited to:

- Demonstration that the site in question has different beneficial uses (e.g., more or less sensitive species) as demonstrated in a UAA or that the site has physical or chemical characteristics that may alter the biological availability or toxicity of the chemical.
- Provide a thorough review of current technology and technology-based limits which can be achieved at the facility(ies) on the study reach.
- Provide a thorough review of historical limits and compliance with these limits at all facilities in the study reach.
- Conduct a detailed economic analysis of compliance with existing, proposed objectives.
- Conduct an analysis of compliance and consistency with all federal, state, and regional plans and policies.

Once it is agreed that a site-specific objective is needed, the studies are performed, and an objective is developed, the following criteria must be addressed in the proposal for the new objective.

- Assurance that aquatic life and terrestrial predators are not currently threatened or impaired from bioaccumulation of the specific pollutant and that the biota will not be threatened or impaired by the proposed site-specific level of this pollutant. Safe tissue concentrations will be determined from the literature and from consultation with the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

For terrestrial predators, the presence, absence, or threat of harmful bioaccumulated pollutants will be determined through consultation with the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

- Assurance that human consumers of fish and shellfish are currently protected from bioaccumulation of the study pollutant, and will not be affected from bioaccumulation of this pollutant under the proposed site-specific objective.
- Assurance that aquatic life is currently, and will be protected from chronic toxicity from the proposed site-specific objective.
- Assurance that the integrity of the aquatic ecosystem will be protected under the proposed site-specific objective.
- Assurance that no other beneficial uses will be threatened or impaired by the proposed site-specific objective.

Compliance with Water Quality Objectives

On January 30, 2003, the Regional Board adopted Resolution No. 2003-001 amending this Basin Plan to incorporate language authorizing compliance schedules in NPDES permits. Resolution No. 2003-001 was subsequently approved by the State Water Resources Control Board, Office of Administrative Law, and the U.S. Environmental Protection Agency. On April 15, 2008, the State Water Resources Control Board adopted Resolution No. 2008-0025, which established a state-wide *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*. State Water Resources Control Board Resolution No. 2008-0025 superseded all existing provisions authorizing compliance schedules in Basin Plans, including Regional Board Resolution No. 2003-001, except for existing compliance schedule provisions in TMDL implementation plans that are in effect as of the effective date of Resolution No. 2008-0025. Further information on State Water Resources Control Board Resolution No. 2008-0025 is discussed in Chapter 5, Plans and Policies.

ATTACHMENT 36

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITIES

ORDER
NPDES NO. CAS000001

This Order was adopted by the State Water Resources Control Board on:	April 1, 2014
This Order shall become effective on:	July 1, 2015
This Order shall expire on:	June 30, 2020

IT IS HEREBY ORDERED that as of July 1, 2015 this Order supersedes Order 97-03-DWQ except for Order 97-03-DWQ's requirement to submit annual reports by July 1, 2015 and except for enforcement purposes. As of July 1, 2015, a Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

CERTIFICATION

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order, including its fact sheet, attachments, and appendices is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on April 1, 2014.

AYE: Chair Felicia Marcus
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore

NAY: None

ABSENT: Board Member Dorene D'Adamo

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

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Attachment D Permit Registration Documents (PRDs)

Attachment E TMDL Implementation

Attachment F Effluent Limitation Guidelines (ELGs)

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Attachment H Storm Water Sample Collection and Handling Instructions

Appendix 1 Storm Water Pollution Prevention Plan (SWPPP) Checklist

Appendix 2 No Exposure Certification (NEC) Conditional Exclusion Instructions

Appendix 3 Waterbodies with Clean Water Act section 303(d) Listed Impairments

I. FINDINGS

A. General Findings

The State Water Resources Control Board (State Water Board) finds that:

1. The Federal Clean Water Act (Clean Water Act) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. (33 U.S.C. §§ 1311, 1342 (also referred to as Clean Water Act §§ 301, 402).) The United States Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the Clean Water Act's mandate to control pollutants in storm water discharges. (40 C.F.R. § 122, et seq.) The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges (NSWDs). The NPDES permit must also include additional requirements necessary to implement applicable water quality objectives or water quality standards (water quality standards, collectively).
2. On November 16, 1990, U.S. EPA promulgated Phase I storm water regulations in compliance with section 402(p) of the Clean Water Act. (55 Fed. Reg. 47990, codified at 40 C.F.R. § 122.26.) These regulations require operators of facilities subject to storm water permitting (Dischargers), that discharge storm water associated with industrial activity (industrial storm water discharges), to obtain an NPDES permit. Section 402(p)(3)(A) of the Clean Water Act also requires that permits for discharges associated with industrial activity include requirements necessary to meet water quality standards.
3. Phase II storm water regulations¹ require permitting for storm water discharges from facilities owned and operated by a municipality with a population of less than 100,000. The previous exemption from the Phase I permitting requirements under section 1068 of the Intermodal Surface Transportation Efficiency Act of 1991 was eliminated.
4. This Order (General Permit) is an NPDES General Permit issued in compliance with section 402 of the Clean Water Act and shall take effect on July 1, 2015, provided that the Regional Administrator of U.S. EPA has no objection. If the U.S. EPA Regional Administrator has an objection, this General Permit will not become effective until the objection is withdrawn.
5. This action to adopt an NPDES General Permit is exempt from the provisions of the California Environmental Quality Act (Pub. Resources Code, § 21000, et seq.) in accordance with section 13389 of the Water Code. (See *County of*

¹ U.S. EPA. Final NPDES Phase II Rule. <<http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>>. [as of February 4, 2014]

Los Angeles v. California State Water Resources Control Bd. (2006) 143 Cal.App.4th 985.)

6. State Water Board Order 97-03-DWQ is rescinded as of the effective date of this General Permit (July 1, 2015) except for Order 97-03-DWQ's requirement that annual reports be submitted by July 1, 2015 and except for enforcement purposes.
7. Effective July 1, 2015, the State Water Board and the Regional Water Quality Control Boards (Regional Water Boards) (Water Boards, collectively) will enforce the provisions herein.
8. This General Permit authorizes discharges of industrial storm water to waters of the United States, so long as those discharges comply with all requirements, provisions, limitations, and prohibitions in this General Permit.
9. Industrial activities covered under this General Permit are described in Attachment A.
10. The Fact Sheet for this Order is incorporated as findings of this General Permit.
11. Acronyms are defined in Attachment B and terms used in this General Permit are defined in Attachment C.
12. This General Permit regulates industrial storm water discharges and authorized NSWDS from specific categories of industrial facilities identified in Attachment A hereto, and industrial storm water discharges and authorized NSWDS from facilities designated by the Regional Water Boards to obtain coverage under this General Permit. This General Permit does not apply to industrial storm water discharges and NSWDS that are regulated by other individual or general NPDES permits
13. This General Permit does not preempt or supersede the authority of municipal agencies to prohibit, restrict, or control industrial storm water discharges and authorized NSWDS that may discharge to storm water conveyance systems or other watercourses within their jurisdictions as allowed by state and federal law.
14. All terms defined in the Clean Water Act, U.S. EPA regulations, and the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000, et seq.) will have the same definition in this General Permit unless otherwise stated.
15. Pursuant to 40 Code of Federal Regulations section 131.12 and State Water Board Resolution 68-16, which incorporates the requirements of 40 Code of Federal Regulations section 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality to a level that does not achieve water quality objectives and protect beneficial uses. Any degradation of water quality from existing high quality water to a level that achieves water quality objectives and

protects beneficial uses is appropriate to support economic development. This General Permit's requirements constitute best practicable treatment or control for discharges of industrial storm water and authorized non-storm water discharges, and are therefore consistent with those provisions.

16. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable permits.
17. This General Permit requires that the Discharger certify and submit all Permit Registration Documents (PRDs) for Notice of Intent (NOI) and No Exposure Certification (NEC) coverage via the State Water Board's Storm Water Multiple Application and Report Tracking System (SMARTS) website. (See Attachment D for an example of the information required to be submitted in the PRDs via SMARTS.) All other documents required by this General Permit to be electronically certified and submitted via SMARTS can be submitted by the Discharger or by a designated Duly Authorized Representative on behalf of the Discharger. Electronic reporting is required to reduce the state's reliance on paper, to improve efficiency, and to make such General Permit documents more easily accessible to the public and the Water Boards.
18. All information provided to the Water Boards shall comply with the Homeland Security Act and all other federal law that concerns security in the United States, as applicable.

B. Industrial Activities Not Covered Under this General Permit

19. Discharges of storm water from areas on tribal lands are not covered under this General Permit. Storm water discharges from industrial facilities on tribal lands are regulated by a separate NPDES permit issued by U.S. EPA.
20. Discharges of storm water regulated under another individual or general NPDES permit adopted by the State Water Board or Regional Water Board are not covered under this General Permit, including the State Water Board NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.
21. Storm water discharges to combined sewer systems are not covered under this General Permit. These discharges must be covered by an individual permit. (40 C.F.R. § 122.26(a)(7).)
22. Conveyances that discharge storm water runoff combined with municipal sewage are not covered under this General Permit.
23. Discharges of storm water identified in Clean Water Act section 402(l) (33 U.S.C. § 1342(l)) are not covered under this General Permit.
24. Facilities otherwise subject to this General Permit but for which a valid Notice of Non-Applicability (NONA) has been certified and submitted via SMARTS, by the Entity are not covered under this General Permit. Entities (See Section XX.C.1 of this General Permit) who are claiming "No Discharge"

through the NONA shall meet the eligibility requirements and provide a No Discharge Technical Report in accordance with Section XX.C.

25. This General Permit does not authorize discharges of dredged or fill material regulated by the US Army Corps of Engineers under section 404 of the Clean Water Act and does not constitute a water quality certification under section 401 of the Clean Water Act.

C. Discharge Prohibitions

26. Pursuant to section 13243 of the Water Code, the State Water Board may specify certain conditions or areas where the discharge of waste, or certain types of waste, is prohibited.
27. With the exception of certain authorized NSWDS as defined in Section IV, this General Permit prohibits NSWDS. The State Water Board recognizes that certain NSWDS should be authorized because they are not generated by industrial activity, are not significant sources of pollutants when managed appropriately, and are generally unavoidable because they are related to safety or would occur regardless of industrial activity. Prohibited NSWDS may be authorized under other individual or general NPDES permits, or waste discharge requirements issued by the Water Boards.
28. Prohibited NSWDS are referred to as unauthorized NSWDS in this General Permit. Unauthorized NSWDS shall be either eliminated or permitted by a separate NPDES permit. Unauthorized NSWDS may contribute significant pollutant loads to receiving waters. Measures to control sources of unauthorized NSWDS such as spills, leakage, and dumping, must be addressed through the implementation of Best Management Practices (BMPs).
29. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the Water Boards.
30. Direct discharges of waste, including industrial storm water discharges, to Areas of Special Biological Significance (ASBS) are prohibited unless the Discharger has applied for and the State Water Board has granted an exception to the State Water Board's 2009 Water Quality Control Plan for Ocean Waters of California as amended by State Water Board Resolution 2012-0056 (California Ocean Plan)² allowing the discharge.

² State Water Resources Control Board. Ocean Standards Web Page.

<http://www.waterboards.ca.gov/water_issues/programs/ocean/>. [as of February 4, 2014].

State Water Resources Control Board. Water Quality Control Plan for Ocean Waters of California 2009.

<http://www.waterboards.ca.gov/water_issues/programs/ocean/docs/2009_cop_adoptedeffective_usepa.pdf>. [as of February 4, 2014].

State Water Resources Control Board. Resolution 2012-0056.

<http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0056.pdf>. [as of February 4, 2014].

D. Effluent Limitations

31. Section 301(b) of the Clean Water Act and 40 Code of Federal Regulations section require NPDES permits to include technology-based requirements at a minimum, and any more stringent effluent limitations necessary for receiving waters to meet applicable water quality standards. Clean Water Act section 402(p)(3)(A) requires that discharges of storm water runoff from industrial facilities comply with Clean Water Act section 301.
32. This General Permit requires control of pollutant discharges using BAT and BCT to reduce and prevent discharges of pollutants, and any more stringent effluent limitations necessary for receiving waters to meet applicable water quality standards.
33. It is not feasible for the State Water Board to establish numeric technology based effluent limitations for discharges authorized by this General Permit at this time. The rationale for this determination is discussed in detail in the Fact Sheet of this General Permit. Therefore, this General Permit requires Dischargers to implement minimum BMPs and applicable advanced BMPs as defined in Section X.H (collectively, BMPs) to comply with the requirements of this General Permit. This approach is consistent with U.S. EPA's 2008 Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (2008 MSGP).
34. 40 Code of Federal Regulations section 122.44(d) requires that NPDES permits include Water Quality Based Effluent Limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality standards for receiving waters.
35. Where numeric water quality criteria have not been established, 40 Code of Federal Regulations section 122.44(d)(1)(vi) provides that WQBELs may be established using U.S. EPA criteria guidance under section 304(a) of the Clean Water Act, a proposed state criteria or policy interpreting narrative criteria supplemented with other relevant information, and/or an indicator parameter.
36. This General Permit requires Dischargers to implement BMPs when necessary, in order to support attainment of water quality standards. The use of BMPs to control or abate the discharge of pollutants is authorized by 40 Code of Federal Regulations section 122.44(k)(3) because numeric effluent limitations are infeasible and implementation of BMPs is reasonably necessary to achieve effluent limitations and water quality standards, and to carry out the purposes and intent of the Clean Water Act. (40 C.F.R. § 122.44(k)(4).)

E. Receiving Water Limitations

37. This General Permit requires compliance with receiving water limitations based on water quality standards. The primary receiving water limitation requires that industrial storm water discharges and authorized NSWDS not

cause or contribute to an exceedance of applicable water quality standards. Water quality standards apply to the quality of the receiving water, not the quality of the industrial storm water discharge. Therefore, compliance with the receiving water limitations generally cannot be determined solely by the effluent water quality characteristics. If any Discharger's storm water discharge causes or contributes to an exceedance of a water quality standard, that Discharger must implement additional BMPs or other control measures in order to attain compliance with the receiving water limitation. Compliance with water quality standards may, in some cases, require Dischargers to implement controls that are more protective than controls implemented solely to comply with the technology-based requirements in this General Permit.

F. Total Maximum Daily Loads (TMDLs)

38. TMDLs relate to the maximum amount of a pollutant that a water body can receive and still attain water quality standards. A TMDL is defined as the sum of the allowable loads of a single pollutant from all contributing point sources (the waste load allocations) and non-point sources (load allocations), plus the contribution from background sources. (40 C.F.R. § 130.2(i).) Discharges addressed by this General Permit are considered to be point source discharges, and therefore must comply with effluent limitations that are "consistent with the assumptions and requirements of any available waste load allocation for the discharge prepared by the state and approved by U.S. EPA pursuant to 40 Code of Federal Regulations section 130.7. (40 C.F.R. § 122.44 (d)(1)(vii).) In addition, Water Code section 13263, subdivision (a), requires that waste discharge requirements implement any relevant water quality control plans. Many TMDLs contained in water quality control plans include implementation requirements in addition to waste load allocations. Attachment E of this General Permit lists the watersheds with U.S. EPA-approved and U.S. EPA-established TMDLs that include requirements, including waste load allocations, for Dischargers covered by this General Permit.

39. The State Water Board recognizes that it is appropriate to develop TMDL-specific permit requirements derived from each TMDL's waste load allocation and implementation requirements, in order to provide clarity to Dischargers regarding their responsibilities for compliance with applicable TMDLs. The development of TMDL-specific permit requirements is subject to public noticing requirements and a corresponding public comment period. Due to the number and variety of Dischargers subject to a wide range of TMDLs, development of TMDL-specific permit requirements for each TMDL listed in Attachment E will severely delay the reissuance of this General Permit. Because most of the TMDLs were established by the Regional Water Boards, and because some of the waste load allocations and/or implementation requirements may be shared by multiple Dischargers, the development of TMDL-specific permit requirements is best coordinated at the Regional Water Board level.

40. State and Regional Water Board staff will develop proposed TMDL-specific permit requirements (including monitoring and reporting requirements) for each of the TMDLs listed in Attachment E. After conducting a 30-day public comment period, the Regional Water Boards will submit to the State Water Board proposed TMDL-specific permit requirements for adoption by the State Water Board into this General Permit by July 1, 2016. The Regional Water Boards may also include proposed TMDL-specific monitoring requirements for inclusion in this General Permit, or may issue Regional Water Board orders pursuant to Water Code section 13383 requiring TMDL-specific monitoring. The proposed TMDL-specific permit requirements shall have no force or effect until adopted, with or without modification, by the State Water Board. Consistent with the 2008 MSGP, Dischargers are not required to take any additional actions to comply with the TMDLs listed in Attachment E until the State Water Board reopens this General Permit and includes TMDL-specific permit requirements, unless notified otherwise by a Regional Water Board.
41. The Regional Water Boards shall submit to the State Water Board the following information for each of the TMDLs listed in Attachment E:
- a. Proposed TMDL-specific permit, monitoring and reporting requirements applicable to industrial storm water discharges and NSWDS authorized under this General Permit, including compliance schedules and deliverables consistent with the TMDLs. TMDL-specific permit requirements are not limited by the BAT/BCT technology-based standards;
 - b. An explanation of how the proposed TMDL-specific permit requirements, compliance schedules, and deliverables are consistent with the assumptions and requirements of any applicable waste load allocation and implement each TMDL; and,
 - c. Where a BMP-based approach is proposed, an explanation of how the proposed BMPs will be sufficient to implement applicable waste load allocations.
42. Upon receipt of the information described in Finding 40, and no later than July 1, 2016, the State Water Board will issue a public notice and conduct a public comment period for the reopening of this General Permit to amend Attachment E, the Fact Sheet, and other provisions as necessary for incorporation of TMDL-specific permit requirements into this General Permit. Attachment E may also be subsequently reopened during the term of this General Permit to incorporate additional TMDL-specific permit requirements.

G. Discharges Subject to the California Ocean Plan

43. On October 16, 2012 the State Water Board amended the California Ocean Plan. The amended California Ocean Plan requires industrial storm water dischargers with outfalls discharging to ocean waters to comply with the

California Ocean Plan's model monitoring provisions. These provisions require Dischargers to: (a) monitor runoff for specific parameters at all outfalls from two storm events per year, and collect at least one representative receiving water sample per year, (b) conduct specified toxicity monitoring at certain types of outfalls at a minimum of once per year, and (c) conduct marine sediment monitoring for toxicity under specific circumstances. The California Ocean Plan provides conditions under which some of the above monitoring provisions may be waived by the Water Boards.

44. This General Permit requires Dischargers with outfalls discharging to ocean waters that are subject to the model monitoring provisions of the California Ocean Plan to develop and implement a monitoring plan in compliance with those provisions and any additional monitoring requirements established pursuant to Water Code section 13383. Dischargers that have not developed and implemented a monitoring program in compliance with the California Ocean Plan's model monitoring provisions by July 1, 2015 (the effective date of this General Permit), or seven (7) days prior to commencing operations, whichever is later, are ineligible to obtain coverage under this General Permit.
45. The California Ocean Plan prohibits the direct discharge of waste to ASBS. ASBS are defined in California Ocean Plan as "those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable."
46. The California Ocean Plan authorizes the State Water Board to grant an exception to Ocean Plan provisions where the board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served.
47. On March 20, 2012, the State Water Board adopted Resolution 2012-0012 which contains exceptions to the California Ocean Plan for specific discharges of storm water and non-point sources. This resolution also contains the special protections that are to be implemented for those discharges to ASBS.
48. This General Permit requires Dischargers who have been granted an exception to the Ocean Plan authorizing the discharges to ASBS by the State Water Board to comply with the requirements contained in Section VIII.B of this General Permit.

H. Training

49. To improve compliance and maintain consistent implementation of this General Permit, Dischargers are required to designate a Qualified Industrial Storm Water Practitioner (QISP) for each facility the Discharger operates that has entered Level 1 status in the Exceedance Response Action (ERA) process as described in Section XII of this General Permit. A QISP may be assigned to more than one facility. In order to qualify as a QISP, a State

Water Board-sponsored or approved training course must be completed. A competency exam may be required by the State Water Board to demonstrate sufficient knowledge of the QISP course material.

50. A QISP must assist the Discharger in completing the Level 1 status and Level 2 status ERA requirements as specified in Section XII of this General Permit. A QISP is also responsible for assisting New Dischargers that will be discharging to an impaired water body with a 303(d) listed impairment, demonstrate eligibility for coverage through preparing the data and/or information required in Section VII.B.
51. A Compliance Group Leader, as defined in Section XIV of this General Order must complete a State Water Board sponsored or approved training program for Compliance Group Leaders.
52. All engineering work subject to the Professional Engineers Act (Bus. & Prof. Code § 6700, et seq.) and required by this General Permit shall be performed by a California licensed professional engineer.
53. California licensed professional civil, industrial, chemical, and mechanical engineers and geologists have licenses that have professional overlap with the topics of this General Permit. The California Department of Consumer Affairs, Board for Professional Engineers, Land Surveyors and Geologists (CBPELSG) provides the licensure and regulation of professional civil, industrial, chemical, and mechanical engineers and professional geologists in California. The State Water Board is developing a specialized self-guided State Water Board-sponsored registration and training program specifically for these CPBELSG licensed engineers and geologists in good standing with CBPELSG.

I. Storm Water Pollution Prevention Plan (SWPPP) Requirements

54. This General Permit requires the development of a site-specific SWPPP in accordance with Section X of this General Permit. The SWPPP must include the information needed to demonstrate compliance with the requirements of this General Permit. The SWPPP must be submitted electronically via SMARTS, and a copy be kept at the facility. SWPPP revisions shall be completed in accordance with Section X.B of this General Permit

J. Sampling, Visual Observations, Reporting and Record Keeping

55. This General Permit complies with 40 Code of Federal Regulations section 122.44(i), which establishes monitoring requirements that must be included in storm water permits. Under this General Permit, Dischargers are required to:
 - (a) conduct an Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation) to identify areas of the facility contributing pollutants to industrial storm water discharges, (b) evaluate whether measures to reduce or prevent industrial pollutant loads identified in the Discharger's SWPPP are adequate and properly implemented in accordance with the terms of this

General Permit, and (c) determine whether additional control measures are needed.

56. This General Permit contains monitoring requirements that are necessary to determine whether pollutants are being discharged, and whether response actions are necessary. Data and information resulting from the monitoring will assist in Dischargers' evaluations of BMP effectiveness and compliance with this General Permit. Visual observations are one form of monitoring. This General Permit requires Dischargers to perform a variety of visual observations designed to identify pollutants in industrial storm water discharges and their sources. To comply with this General Permit Dischargers shall: (1) electronically self-report any violations via SMARTS, (2) comply with the Level 1 status and Level 2 status ERA requirements, when applicable, and (3) adequately address and respond to any Regional Water Board comments on the Discharger's compliance reports.

57. Dischargers that meet the requirements of the No Exposure Certification (NEC) Conditional Exclusion set forth in Section XVII of this General Permit are exempt from the SWPPP requirements, sampling requirements, and visual observation requirements in this General Permit.

K. Facilities Subject to Federal Storm Water Effluent Limitation Guidelines (ELGs)

58. U.S. EPA regulations at 40 Code of Federal Regulations Chapter I Subchapter N (Subchapter N) establish technology-based Effluent Limitation Guidelines and New Source Performance Standards (ELGs) for industrial storm water discharges from facilities in specific industrial categories. For these facilities, compliance with the BAT/BCT and ELG requirements constitutes compliance with technology-based requirements of this General Permit.

59. 40 Code of Federal Regulations section 122.44(i)(3) and (4) require storm water permits to require at least one Annual Evaluation and any monitoring requirements for applicable ELGs in Subchapter N. This General Permit requires Dischargers to comply with all applicable ELG requirements found in Subchapter N.

L. Sampling and Analysis Reduction

60. This General Permit reduces the number of qualifying sampling events required to be sampled each year when the Discharger demonstrates: (1) consistent compliance with this General Permit, (2) consistent effluent water quality sampling, and (3) analysis results that do not exceed numerical action levels.

M. Role of Numeric Action Levels (NALs) and Exceedance Response Actions (ERAs)

61. This General Permit incorporates a multiple objective performance measurement system that includes NALs, new comprehensive training requirements, Level 1 ERA Reports, Level 2 ERA Technical Reports, and Level 2 ERA Action Plans. Two objectives of the performance measurement system are to inform Dischargers, the public and the Water Boards on: (1) the overall pollutant control performance at any given facility, and (2) the overall performance of the industrial statewide storm water program. Additionally, the State Water Board expects that this information and assessment process will provide information necessary to determine the feasibility of numeric effluent limitations for industrial dischargers in the next reissuance of this General Permit, consistent with the State Water Board Storm Water Panel of Experts' June 2006 Recommendations.³
62. This General Permit contains annual and instantaneous maximum NALs. The annual NALs are established as the 2008 MSGP benchmark values, and are applicable for all parameters listed in Table 2. The instantaneous maximum NALs are calculated from a Water Board dataset, and are only applicable for Total Suspended Solids (TSS), Oil and Grease (O&G), and pH. An NAL exceedance is determined as follows:
- a. For annual NALs, an exceedance occurs when the average of all analytical results from all samples taken at a facility during a reporting year for a given parameter exceeds an annual NAL value listed in Table 2 of this General Permit; or,
 - b. For the instantaneous maximum NALs, an exceedance occurs when two or more analytical results from samples taken for any parameter within a reporting year exceed the instantaneous maximum NAL value (for Total Suspended Solids, and Oil and Grease), or are outside of the instantaneous maximum NAL range (for pH) listed in Table 2 of this General Permit. For the purposes of this General Permit, the reporting year is July 1 through June 30.
63. The NALs are not intended to serve as technology-based or water quality-based numeric effluent limitations. The NALs are not derived directly from either BAT/BCT requirements or receiving water objectives. NAL exceedances defined in this General Permit are not, in and of themselves, violations of this General Permit. A Discharger that does not fully comply with the Level 1 status and/or Level 2 status ERA requirements, when required by the terms of this General Permit, is in violation of this General Permit.
64. ERAs are designed to assist Dischargers in complying with this General Permit. Dischargers subject to ERAs must evaluate the effectiveness of their

³ State Water Board Storm Water Panel of Experts, The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 19, 2006) <http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/numeric/swpanel_final_report.pdf> [as of February 4, 2014].

BMPs being implemented to ensure they are adequate to achieve compliance with this General Permit.

65. U.S. EPA regulations at Subchapter N establish ELGs for storm water discharges from facilities in 11 industrial categories. Dischargers subject to these ELGs are required to comply with the applicable requirements.
66. Exceedances of the NALs that are attributable solely to pollutants originating from non-industrial pollutant sources (such as run-on from adjacent facilities, non-industrial portions of the Discharger's property, or aerial deposition) are not a violation of this General Permit because the NALs are designed to provide feedback on industrial sources of pollutants. Dischargers may submit a Non-Industrial Source Pollutant Demonstration as part of their Level 2 ERA Technical Report to demonstrate that the presence of a pollutant causing an NAL exceedance is attributable solely to pollutants originating from non-industrial pollutant sources.
67. A Discharger who has designed, installed, and implemented BMPs to reduce or prevent pollutants in industrial storm water discharges in compliance with this General Permit may submit an Industrial Activity BMPs Demonstration, as part of their Level 2 ERA Technical Report.
68. This General Permit establishes design storm standards for all treatment control BMPs. These design standards are directly based on the standards in State Water Board Order 2000-0011 regarding Standard Urban Storm Water Mitigation Plans (SUSMPs). These design standards are generally expected to be consistent with BAT/BCT, to be protective of water quality, and to be effective for most pollutants. The standards are intended to eliminate the need for most Dischargers to further treat/control industrial storm water discharges that are unlikely to contain pollutant loadings that exceed the NALs set forth in this General Permit.

N. Compliance Groups

69. Compliance Groups are groups of Dischargers (Compliance Group Participants) that share common types of pollutant sources and industrial activity characteristics. Compliance Groups provide an opportunity for the Compliance Group Participants to combine resources and develop consolidated Level 1 ERA Reports for Level 1 NAL exceedances and appropriate BMPs for implementation in response to Level 2 status ERA requirements that are representative of the entire Compliance Group. Compliance Groups also provide the Water Boards and the public with valuable information as to how industrial storm water discharges are affected by non-industrial background pollutant sources (including natural background) and geographic locations. When developing the next reissuance of this General Permit, the State Water Board expects to have a better understanding of the feasibility and benefits of sector-specific and watershed-based permitting alternatives, which may include technology- or water quality-based numeric effluent limitations. The effluent data, BMP performance data

and other information provided from Compliance Groups' consolidated reporting will further assist the State Water Board in addressing sector-specific and watershed-based permitting alternatives.

O. Conditional Exclusion – No Exposure Certification (NEC)

70. Pursuant to U.S. EPA Phase II regulations, all Dischargers subject to this General Permit may qualify for a conditional exclusion from specific requirements if they submit a NEC demonstrating that their facilities have no exposure of industrial activities and materials to storm water discharges.
71. This General Permit requires Dischargers who seek the NEC conditional exclusion to obtain coverage in accordance with Section XVII of this General Permit. Dischargers that meet the requirements of the NEC are exempt from the SWPPP, sampling requirements, and monitoring requirements in this General Permit.
72. Dischargers seeking NEC coverage are required to certify and submit the applicable permit registration documents. Annual inspections, re-certifications, and fees are required in subsequent years. Light industry facility Dischargers excluded from coverage under the previous permit (Order 97-03-DWQ) must obtain the appropriate coverage under this General Permit. Failure to comply with the Conditional Exclusion conditions listed in this General Permit may lead to enforcement for discharging without a permit pursuant to sections 13385 or 13399.25, et seq., of the Water Code. A Discharger with NEC coverage that anticipates a change (or changes) in circumstances that would lead to exposure should register for permit coverage prior to the anticipated changes.

P. Special Requirements for Facilities Handling Plastic Materials

73. Section 13367 of the Water Code requires facilities handling preproduction plastic to implement specific BMPs aimed at minimizing discharges of such materials. The definition of Plastic Materials for the purposes of this General Permit includes the following types of sources of Plastic Materials: virgin and recycled plastic resin pellets, powders, flakes, powdered additives, regrind, dust, and other types of preproduction plastics with the potential to discharge or migrate off-site.

Q. Regional Water Board Authorities

74. Regional Water Boards are primarily responsible for enforcement of this General Permit. This General Permit recognizes that Regional Water Boards have the authority to protect the beneficial uses of receiving waters and prevent degradation of water quality in their region. As such, Regional Water Boards may modify monitoring requirements and review, comment, approve or disapprove certain Discharger submittals required under this General Permit.

IT IS HEREBY ORDERED that all Dischargers subject to this General Permit shall comply with the following conditions and requirements.

II. RECEIVING GENERAL PERMIT COVERAGE

A. Certification

1. For Storm Water Multiple Application and Report Tracking System (SMARTS) electronic account management and security reasons, as well as enforceability of this General Permit, the Discharger's Legally Responsible Person (LRP) of an industrial facility seeking coverage under this General Permit shall certify and submit all Permit Registration Documents (PRDs) for Notice of Intent (NOI) or No Exposure Certification (NEC) coverage. All other documents shall be certified and submitted via SMARTS by the Discharger's (LRP) or by their Duly Authorized Representative in accordance with the Electronic Signature and Certification Requirements in Section XXI.K. All documents required by this General Permit that are certified and submitted via SMARTS shall be in accordance with Section XXI.K.
2. Hereinafter references to certifications and submittals by the Discharger refer to the Discharger's LRP and their Duly Authorized Representative.

B. Coverages

This General Permit includes requirements for two (2) types of permit coverage, NOI coverage and NEC coverage. State Water Board Order 97-03-DWQ (previous permit) remains in effect until July 1, 2015. When PRDs are certified and submitted and the annual fee is received, the State Water Board will assign the Discharger a Waste Discharger Identification (WDID) number.

1. General Permit Coverage (NOI Coverage)
 - a. Dischargers that discharge storm water associated with industrial activity to waters of the United States are required to meet all applicable requirements of this General Permit.
 - b. The Discharger shall register for coverage under this General Permit by certifying and submitting PRDs via SMARTS (<http://smarts.waterboards.ca.gov>), which consist of:
 - i. A completed NOI and signed certification statement;
 - ii. A copy of a current Site Map from the Storm Water Pollution Prevention Plan (SWPPP) in Section X.E;
 - iii. A SWPPP (see Section X); and,

- c. The Discharger shall pay the appropriate Annual Fee in accordance with California Code of Regulations, title 23, section 2200 et seq.⁴
2. General Permit Coverage (NEC Coverage)
 - a. Dischargers that certify their facility has no exposure of industrial activities or materials to storm water in accordance with Section XVII qualify for NEC coverage and are not required to comply with the SWPPP or monitoring requirements of this General Permit.
 - b. Dischargers who qualify for NEC coverage shall conduct one Annual Facility Comprehensive Compliance Evaluation (Annual Evaluation) as described in Section XV, pay an annual fee, and certify annually that their facilities continue to meet the NEC requirements.
 - c. The Discharger shall submit the following PRDs on or before October 1, 2015 for NEC coverage via SMARTS:
 - i. A completed NEC Form (Section XVII.F.1) and signed certification statement (Section XVII.H);
 - ii. A completed NEC Checklist (Section XVII.F.2); and
 - iii. A current Site Map consistent with requirements in Section X.E.;
 - d. The Discharger shall pay the appropriate annual fee in accordance with California Code of Regulations, title 23, section 2200 et seq.⁵
 3. General PRD Requirements
 - a. Site Maps

Dischargers registering for NOI or NEC coverage shall prepare a site map(s) as part of their PRDs in accordance with Section X.E. A separate copy of the site map(s) is required to be in the SWPPP. If there is a significant change in the facility layout (e.g., new building, change in storage locations, boundary change, etc.) a revision to the site map is required and shall be certified and submitted via SMARTS.
 - b. A Discharger shall submit a single set of PRDs for coverage under this General Permit for multiple industrial activities occurring at the same facility.
 - c. Any information provided to the Water Boards by the Discharger shall comply with the Homeland Security Act and other federal law that

⁴ Annual fees must be mailed or sent electronically using the State Water Boards' Electronic Funds Transfer (EFT) system in SMARTS.

⁵ See footnote 4.

addresses security in the United States; any information that does not comply should not be submitted in the PRDs. The Discharger must provide justification to the Regional Water Board regarding redacted information within any submittal.

- d. Dischargers may redact trade secrets from information that is submitted via SMARTS. Dischargers who certify and submit redacted information via SMARTS must include a general description of the redacted information and the basis for the redaction in the version that is submitted via SMARTS. Dischargers must submit complete and un-redacted versions of the information that are clearly labeled "CONFIDENTIAL" to the Regional Water Board within 30 days of the submittal of the redacted information. All information labeled "CONFIDENTIAL" will be maintained by the Water Boards in a separate, confidential file.
4. Schedule for Submitting PRDs - Existing Dischargers Under the Previous Permit.
- a. Existing Dischargers⁶ with coverage under the previous permit shall continue coverage under the previous permit until July 1, 2015. All waste discharge requirements and conditions of the previous permit are in effect until July 1, 2015.
 - b. Existing Dischargers with coverage under the previous permit shall register for NOI coverage by July 1, 2015 or for NEC coverage by October 1, 2015. Existing Dischargers previously listed in Category 10 (Light Industry) of the previous permit, and continue to have no exposure to industrial activities and materials, have until October 1, 2015 to register for NEC coverage.
 - c. Existing Dischargers with coverage under the previous permit, that do not register for NOI coverage by July 1, 2015, may have their permit coverage administratively terminated as soon as July 1, 2015.
 - d. Existing Dischargers with coverage under the previous permit that are eligible for NEC coverage but do not register for NEC coverage by October 1, 2015 may have their permit coverage administratively terminated as soon as October 1, 2015.
 - e. Existing Dischargers shall continue to comply with the SWPPP requirements in State Water Board Order 97-03-DWQ up to, but no later than, June 30, 2015.

⁶ Existing Dischargers are Dischargers with an active Notice of Intent (permit coverage) under the previous permit (97-03-DWQ) prior to the effective date of this General Permit.

- f. Existing Dischargers shall implement an updated SWPPP in accordance with Section X by July 1, 2015.
 - g. Existing Dischargers that submit a Notice of Termination (NOT) under the previous permit prior to July 1, 2015 and that receive NOT approval from the Regional Water Board are not subject to this General Permit unless they subsequently submitted new PRDs.
5. Schedule for Submitting PRDs - New Dischargers Obtaining Coverage On or After July 1, 2015
- New Dischargers registering for NOI coverage on or after July 1, 2015 shall certify and submit PRDs via SMARTS at least seven (7) days prior to commencement of industrial activities or on July 1, 2015, whichever comes later.
- a. New Dischargers registering for NEC coverage shall electronically certify and submit PRDs via SMARTS by October 1, 2015, or at least seven (7) days prior to commencement of industrial activities, whichever is later.

C. Termination and Changes to General Permit Coverage

1. Dischargers with NOI or NEC coverage shall request termination of coverage under this General Permit when either (a) operation of the facility has been transferred to another entity, (b) the facility has ceased operations, completed closure activities, and removed all industrial related pollutants, or (c) the facility's operations have changed and are no longer subject to the General Permit. Dischargers shall certify and submit a Notice of Termination via SMARTS. Until a valid NOT is received, the Discharger remains responsible for compliance with this General Permit and payment of accrued annual fees.
2. Whenever there is a change to the facility location, the Discharger shall certify and submit new PRDs via SMARTS. When ownership changes, the prior Discharger (seller) must inform the new Discharger (buyer) of the General Permit applications and regulatory coverage requirements. The new Discharger must certify and submit new PRDs via SMARTS to obtain coverage under this General Permit.
3. Dischargers with NOI coverage where the facility qualifies for NEC coverage in accordance with Section XVII of this General Permit, may register for NEC coverage via SMARTS. Such Dischargers are not required to submit an NOT to cancel NOI coverage.
4. Dischargers with NEC coverage, where changes in the facility and/or facility operations occur, which result in NOI coverage instead of NEC coverage, shall register for NOI coverage via SMARTS. Such Dischargers are not required to submit an NOT to cancel NEC coverage.

5. Dischargers shall provide additional information supporting an NOT, or revise their PRDs via SMARTS, upon request by the Regional Water Board.
6. Dischargers that are denied approval of a submitted NOT or registration for NEC coverage by the Regional Water Board, shall continue compliance with this General Permit under their existing NOI coverage.
7. New Dischargers (Dischargers with no previous NOI or NEC coverage) shall register for NOI coverage if the Regional Water Board denies NEC coverage.

D. Preparation Requirements

1. The following documents shall be certified and submitted by the Discharger via SMARTS:
 - a. Annual Reports (Section XVI) and SWPPPs (Section X);
 - b. NOTs;
 - c. Sampling Frequency Reduction Certification (Section XI.C.7);
 - d. Level 1 ERA Reports (Section XII.C) prepared by a QISP;
 - e. Level 2 ERA Technical Reports and Level 2 ERA Action Plans (Sections XII.D.1-2) prepared by a QISP; and,
 - f. SWPPPs for inactive mining operations as described in Section XIII, signed (wet signature and license number) by a California licensed professional engineer.
2. The following documents shall be signed (wet signature and license number) by a California licensed professional engineer:
 - a. Calculations for Dischargers subject to Subchapter N in accordance with Section XI.D;
 - b. Notice of Non-Applicability (NONA) Technical Reports described in Section XX.C for facilities that are engineered and constructed to have contained the maximum historic precipitation event (or series of events) using the precipitation data collected from the National Oceanic and Atmospheric Agency's website;
 - c. NONA Technical Reports described in Section XX.C for facilities located in basins or other physical locations that are not tributaries or hydrologically connected to waters of the United States; and,
 - d. SWPPPs for inactive mines described in Section XIII.

III. DISCHARGE PROHIBITIONS

- A. All discharges of storm water to waters of the United States are prohibited except as specifically authorized by this General Permit or another NPDES permit.
- B. Except for non-storm water discharges (NSWDs) authorized in Section IV, discharges of liquids or materials other than storm water, either directly or indirectly to waters of the United States, are prohibited unless authorized by another NPDES permit. Unauthorized NSWDs must be either eliminated or authorized by a separate NPDES permit.
- C. Industrial storm water discharges and authorized NSWDs that contain pollutants that cause or threaten to cause pollution, contamination, or nuisance as defined in section 13050 of the Water Code, are prohibited.
- D. Discharges that violate any discharge prohibitions contained in applicable Regional Water Board Water Quality Control Plans (Basin Plans), or statewide water quality control plans and policies are prohibited.
- E. Discharges to ASBS are prohibited in accordance with the California Ocean Plan, unless granted an exception by the State Water Board and in compliance with the Special Protections contained in Resolution 2012-0012.
- F. Industrial storm water discharges and NSWDs authorized by this General Permit that contain hazardous substances equal to or in excess of a reportable quantity listed in 40 Code of Federal Regulations sections 110.6, 117.21, or 302.6 are prohibited.

IV. AUTHORIZED NON-STORM WATER DISCHARGES (NSWDs)

- A. The following NSWDs are authorized provided they meet the conditions of Section IV.B:
 - 1. Fire-hydrant and fire prevention or response system flushing;
 - 2. Potable water sources including potable water related to the operation, maintenance, or testing of potable water systems;
 - 3. Drinking fountain water and atmospheric condensate including refrigeration, air conditioning, and compressor condensate;
 - 4. Irrigation drainage and landscape watering provided all pesticides, herbicides and fertilizers have been applied in accordance with the manufacturer's label;
 - 5. Uncontaminated natural springs, groundwater, foundation drainage, footing drainage;

6. Seawater infiltration where the seawater is discharged back into the source:
and,
 7. Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but not intentional discharges from the cooling tower (e.g., “piped” cooling tower blowdown or drains).
- B.** The NSWDs identified in Section IV.A are authorized by this General Permit if the following conditions are met:
1. The authorized NSWDs are not in violation of any Regional Water Board Water Quality Control Plans (Basin Plans) or other requirements, or statewide water quality control plans or policies requirement;
 2. The authorized NSWDs are not in violation of any municipal agency ordinance or requirements;
 3. BMPs are included in the SWPPP and implemented to:
 - a. Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
 - b. Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
 - c. Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards;
and,
 - d. Reduce or prevent discharges of pollutants in authorized NSWDs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.
 4. The Discharger conducts monthly visual observations (Section XI.A.1) of NSWDs and sources to ensure adequate BMP implementation and effectiveness; and,
 5. The Discharger reports and describes all authorized NSWDs in the Annual Report.
- C.** Firefighting related discharges are not subject to this General Permit and are not subject to the conditions of Section IV.B. These discharges, however, may be subject to Regional Water Board enforcement actions under other sections of the Water Code. Firefighting related discharges that are contained and are later discharged may be subject to municipal agency ordinances and/or Regional Water Board requirements.

V. EFFLUENT LIMITATIONS

- A.** Dischargers shall implement BMPs that comply with the BAT/BCT requirements of this General Permit to reduce or prevent discharges of pollutants in their storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.
- B.** Industrial storm water discharges from facilities subject to storm water ELGs in Subchapter N shall not exceed those storm water ELGs. The ELGs for industrial storm water discharges subject to Subchapter N are in Attachment F of this General Permit.
- C.** Dischargers located within a watershed for which a Total Maximum Daily Load (TMDL) has been approved by U.S. EPA, shall comply with any applicable TMDL-specific permit requirements that have been incorporated into this General Permit in accordance with Section VII.A. Attachment E contains a reference list of potential TMDLs that may apply to Dischargers subject to this General Permit.

VI. RECEIVING WATER LIMITATIONS

- A.** Dischargers shall ensure that industrial storm water discharges and authorized NSWDS do not cause or contribute to an exceedance of any applicable water quality standards in any affected receiving water.
- B.** Dischargers shall ensure that industrial storm water discharges and authorized NSWDS do not adversely affect human health or the environment.
- C.** Dischargers shall ensure that industrial storm water discharges and authorized NSWDS do not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

VII. TOTAL MAXIMUM DAILY LOADS (TMDLs)

A. Implementation

1. The State Water Board shall reopen and amend this General Permit, including Attachment E, the Fact Sheet and other applicable Permit provisions as necessary, in order to incorporate TMDL-specific permit requirements, as described in Findings 38 through 42. Once this General Permit is amended, Dischargers shall comply with the incorporated TMDL-specific permit requirements in accordance with any specified compliance schedule(s). TMDL-specific compliance dates that exceed the term of this General Permit may be included for reference, and are enforceable in the event that this General Permit is administratively extended or reissued.
2. The State Water Board may, at its discretion, reopen this General Permit to add TMDL-specific permit requirements to Attachment E, or to incorporate new TMDLs adopted during the term of this General Permit that include requirements applicable to Dischargers covered by this General Permit.

- B.** New Dischargers applying for NOI coverage under this General Permit that will be discharging to a water body with a 303(d) listed impairment are ineligible for coverage unless the Discharger submits data and/or information, prepared by a QISP, demonstrating that:
1. The Discharger has eliminated all exposure to storm water of the pollutant(s) for which the water body is impaired, has documented the procedures taken to prevent exposure onsite, and has retained such documentation with the SWPPP at the facility;
 2. The pollutant for which the water body is impaired is not present at the Discharger's facility, and the Discharger has retained documentation of this finding with the SWPPP at the facility; or,
 3. The discharge of any listed pollutant will not cause or contribute to an exceedance of a water quality standard. This is demonstrated if: (1) the discharge complies with water quality standard at the point of discharge, or (2) if there are sufficient remaining waste load allocations in an approved TMDL and the discharge is controlled at least as stringently as similar discharges subject to that TMDL.

VIII. DISCHARGES SUBJECT TO THE CALIFORNIA OCEAN PLAN

A. Discharges to Ocean Waters

1. Dischargers with outfalls discharging to ocean waters that are subject to the model monitoring provisions of the California Ocean Plan shall develop and implement a monitoring plan in compliance with those provisions and any additional monitoring requirements established pursuant to Water Code section 13383. Dischargers who have not developed and implemented a monitoring program in compliance with the California Ocean Plan's model monitoring provisions by July 1, 2015, or seven (7) days prior to commencing of operations, whichever is later, are ineligible to obtain coverage under this General Permit.
2. Dischargers are ineligible for the methods and exceptions provided in Section XI.C of this General permit for any of the outfalls discharging to ocean waters subject to the model monitoring provisions of the California Ocean Plan.

B. Discharge Granted an Exceptions for Areas of Special Biological Significance (ASBS)

Dischargers who were granted an exception to the California Ocean Plan prohibition against direct discharges of waste to an ASBS pursuant to Resolution 2012-0012⁷ amended by Resolution 2012-0031⁸ shall comply with the conditions and requirements set forth in Attachment G of this General Permit. Any Discharger that applies for and is granted an exception to the California Ocean Plan prohibition after July 1, 2013 shall comply with the conditions and requirements set forth in the granted exception.

IX. TRAINING QUALIFICATIONS

A. General

1. A Qualified Industrial Storm Water Practitioner (QISP) is a person (either the Discharger or a person designated by the Discharger) who has completed a State Water Board-sponsored or approved QISP training course⁹, and has registered as a QISP via SMARTS. Upon completed registration the State Water Board will issue a QISP identification number.
2. The Executive Director of the State Water Board or an Executive Officer of a Regional Water Board may rescind any QISP's registration if it is found that the QISP has repeatedly demonstrated an inadequate level of performance in completing the QISP requirements in this General Permit. An individual whose QISP registration has been rescinded may request that the State Water Board review the rescission. Any request for review must be received by the State Water Board no later than 30 days of the date that the individual received written notice of the rescission.
3. Dischargers with Level 1 status shall:
 - a. Designate a person to be the facility's QISP and ensure that this person has attended and satisfactorily completed the State Water Board-sponsored or approved QISP training course.
 - b. Ensure that the facility's designated QISP provides sufficient training to the appropriate team members assigned to perform activities required by this General Permit.

⁷ State Water Resources Control Board. Resolution 2012-0012. <http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0012.pdf>. [as of February 4, 2014].

⁸ State Water Resources Control Board. Resolution 2012-0031. <http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0031.pdf>. [as of February 4, 2014].

⁹ A specialized self-guided State Water Board-sponsored registration and training program will be available as an option for CPBELSG licensed professional civil, mechanical, industrial, and chemical engineers and professional geologists by the effective date of this General Permit.

X. Storm Water Pollution Prevention Plan (SWPPP)**A. SWPPP Elements**

Dischargers shall develop and implement a site-specific SWPPP for each industrial facility covered by this General Permit that shall contain the following elements, as described further in this Section¹⁰:

1. Facility Name and Contact Information;
2. Site Map;
3. List of Industrial Materials;
4. Description of Potential Pollution Sources;
5. Assessment of Potential Pollutant Sources;
6. Minimum BMPs;
7. Advanced BMPs, if applicable;
8. Monitoring Implementation Plan;
9. Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation); and,
10. Date that SWPPP was Initially Prepared and the Date of Each SWPPP Amendment, if Applicable.

B. SWPPP Implementation and Revisions

All Dischargers are required to implement their SWPPP by July 1, 2015 or upon commencement of industrial activity. The Discharger shall:

1. Revise their on-site SWPPP whenever necessary;
2. Certify and submit via SMARTS their SWPPP within 30 days whenever the SWPPP contains significant revision(s); and,
3. With the exception of significant revisions, the Discharger is not required to certify and submit via SMARTS their SWPPP revisions more than once every three (3) months in the reporting year.

¹⁰ Appendix 1 (SWPPP Checklist) of this General Permit is provided to assist the Discharger in including information required in the SWPPP. This checklist is not required to be used.

C. SWPPP Performance Standards

1. The Discharger shall ensure a SWPPP is prepared to:
 - a. Identify and evaluate all sources of pollutants that may affect the quality of industrial storm water discharges and authorized NSWDDs;
 - b. Identify and describe the minimum BMPs (Section X.H.1) and any advanced BMPs (Section X.H.2) implemented to reduce or prevent pollutants in industrial storm water discharges and authorized NSWDDs. BMPs shall be selected to achieve compliance with this General Permit; and,
 - c. Identify and describe conditions or circumstances which may require future revisions to be made to the SWPPP.
2. The Discharger shall prepare a SWPPP in accordance with all applicable SWPPP requirements of this Section. A copy of the SWPPP shall be maintained at the facility.

D. Planning and Organization

1. Pollution Prevention Team

Each facility must have a Pollution Prevention Team established and responsible for assisting with the implementation of the requirements in this General Permit. The Discharger shall include in the SWPPP detailed information about its Pollution Prevention Team including:

- a. The positions within the facility organization (collectively, team members) who assist in implementing the SWPPP and conducting all monitoring requirements in this General Permit;
- b. The responsibilities, duties, and activities of each of the team members; and,
- c. The procedures to identify alternate team members to implement the SWPPP and conduct required monitoring when the regularly assigned team members are temporarily unavailable (due to vacation, illness, out of town business, or other absences).

2. Other Requirements and Existing Facility Plans

- a. The Discharger shall ensure its SWPPP is developed, implemented, and revised as necessary to be consistent with any applicable municipal, state, and federal requirements that pertain to the requirements in this General Permit.
- b. The Discharger may include in their SWPPP the specific elements of existing plans, procedures, or regulatory compliance documents that

contain storm water-related BMPs or otherwise relate to the requirements of this General Permit.

- c. The Discharger shall properly reference the original sources for any elements of existing plans, procedures, or regulatory compliance documents included as part of their SWPPP and shall maintain a copy of the documents at the facility as part of the SWPPP.
- d. The Discharger shall document in their SWPPP the facility's scheduled operating hours as defined in Attachment C. Scheduled facility operating hours that would be considered irregular (temporary, intermittent, seasonal, weather dependent, etc.) shall also be documented in the SWPPP.

E. Site Map

1. The Discharger shall prepare a site map that includes notes, legends, a north arrow, and other data as appropriate to ensure the map is clear, legible and understandable.
2. The Discharger may provide the required information on multiple site maps.
3. The Discharger shall include the following information on the site map:
 - a. The facility boundary, storm water drainage areas within the facility boundary, and portions of any drainage area impacted by discharges from surrounding areas. Include the flow direction of each drainage area, on-facility surface water bodies, areas of soil erosion, and location(s) of nearby water bodies (such as rivers, lakes, wetlands, etc.) or municipal storm drain inlets that may receive the facility's industrial storm water discharges and authorized NSWDS;
 - b. Locations of storm water collection and conveyance systems, associated discharge locations, and direction of flow. Include any sample locations if different than the identified discharge locations;
 - c. Locations and descriptions of structural control measures¹¹ that affect industrial storm water discharges, authorized NSWDS, and/or run-on;
 - d. Identification of all impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures;

¹¹ Examples of structural control measures are catch basins, berms, detention ponds, secondary containment, oil/water separators, diversion barriers, etc.

- e. Locations where materials are directly exposed to precipitation and the locations where identified significant spills or leaks (Section X.G.1.d) have occurred; and
- f. Areas of industrial activity subject to this General Permit. Identify all industrial storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, dust or particulate generating areas, cleaning and material reuse areas, and other areas of industrial activity that may have potential pollutant sources.

F. List of Industrial Materials

The Discharger shall ensure the SWPPP includes a list of industrial materials handled at the facility, and the locations where each material is stored, received, shipped, and handled, as well as the typical quantities and handling frequency.

G. Potential Pollutant Sources

1. Description of Potential Pollutant Sources

a. Industrial Processes

The Discharger shall ensure the SWPPP describes each industrial process including: manufacturing, cleaning, maintenance, recycling, disposal, and any other activities related to the process. The type, characteristics, and approximate quantity of industrial materials used in or resulting from the process shall be included. Areas protected by containment structures and the corresponding containment capacity shall be identified and described.

b. Material Handling and Storage Areas

The Discharger shall ensure the SWPPP describes each material handling and storage area, including: the type, characteristics, and quantity of industrial materials handled or stored; the shipping, receiving, and loading procedures; the spill or leak prevention and response procedures; and the areas protected by containment structures and the corresponding containment capacity.

c. Dust and Particulate Generating Activities

The Discharger shall ensure the SWPPP describes all industrial activities that generate a significant amount of dust or particulate that may be deposited within the facility boundaries. The SWPPP shall describe such industrial activities, including the discharge locations, the source type, and the characteristics of the dust or particulate pollutant.

d. Significant Spills and Leaks

The Discharger shall:

- i. Evaluate the facility for areas where spills and leaks can likely occur;
- ii. Ensure the SWPPP includes:
 - a) A list of any industrial materials that have spilled or leaked in significant quantities and have discharged from the facility's storm water conveyance system within the previous five-year period;
 - b) A list of any toxic chemicals identified in 40 Code of Federal Regulations section 302 that have been discharged from the facilities' storm water conveyance system as reported on U.S. EPA Form R, as well as oil and hazardous substances in excess of reportable quantities (40 C.F.R. §§ 110, 117, and 302) that have discharged from the facility's storm water conveyance system within the previous five-year period;
 - c) A list of any industrial materials that have spilled or leaked in significant quantities and had the potential to be discharged from the facility's storm water conveyance system within the previous five-year period; and,
- iii. Ensure that for each discharge or potential discharge listed above the SWPPP includes the location, characteristics, and approximate quantity of the materials spilled or leaked; approximate quantity of the materials discharged from the facility's storm water conveyance system; the cleanup or remedial actions that have occurred or are planned; the approximate remaining quantity of materials that have the potential to be discharged; and the preventive measures taken to ensure spills or leaks of the material do not reoccur.

e. NSWDs

The Discharger shall:

- i. Ensure the SWPPP includes an evaluation of the facility that identifies all NSWDs, sources, and drainage areas;
- ii. Ensure the SWPPP includes an evaluation of all drains (inlets and outlets) that identifies connections to the storm water conveyance system;
- iii. Ensure the SWPPP includes a description of how all unauthorized NSWDs have been eliminated; and,

- iv. Ensure all NSWDs are described in the SWPPP. This description shall include the source, quantity, frequency, and characteristics of the NSWDs, associated drainage area, and whether it is an authorized or unauthorized NSWD in accordance with Section IV.

f. Erodible Surfaces

The Discharger shall ensure the SWPPP includes a description of the facility locations where soil erosion may be caused by industrial activity, contact with storm water, authorized and unauthorized NSWDs, or run-on from areas surrounding the facility.

2. Assessment of Potential Pollutant Sources

- a. The Discharger shall ensure that the SWPPP includes a narrative assessment of all areas of industrial activity with potential industrial pollutant sources. At a minimum, the assessment shall include:
 - i. The areas of the facility with likely sources of pollutants in industrial storm water discharges and authorized NSWDs;
 - ii. The pollutants likely to be present in industrial storm water discharges and authorized NSWDs;
 - iii. The approximate quantity, physical characteristics (e.g., liquid, powder, solid, etc.), and locations of each industrial material handled, produced, stored, recycled, or disposed;
 - iv. The degree to which the pollutants associated with those materials may be exposed to, and mobilized by contact with, storm water;
 - v. The direct and indirect pathways by which pollutants may be exposed to storm water or authorized NSWDs;
 - vi. All sampling, visual observation, and inspection records;
 - vii. The effectiveness of existing BMPs to reduce or prevent pollutants in industrial storm water discharges and authorized NSWDs;
 - viii. The estimated effectiveness of implementing, to the extent feasible, minimum BMPs to reduce or prevent pollutants in industrial storm water discharges and authorized NSWDs; and,
 - ix. The identification of the industrial pollutants related to the receiving waters with 303(d) listed impairments identified in Appendix 3 or approved TMDLs that may be causing or contributing to an exceedance of a water quality standard in the receiving waters.
- b. Based upon the assessment above, Dischargers shall identify in the SWPPP any areas of the facility where the minimum BMPs described in

subsection H.1 below will not adequately reduce or prevent pollutants in storm water discharges in compliance with Section V.A. Dischargers shall identify any advanced BMPs, as described in subsection H.2 below, for those areas.

- c. Based upon the assessment above, Dischargers shall identify any drainage areas with no exposure to industrial activities and materials in accordance with the definitions in Section XVII.
- d. Based upon the assessment above, Dischargers shall identify any additional parameters, beyond the required parameters in Section XI.B.6 that indicate the presence of pollutants in industrial storm water discharges.

H. Best Management Practices (BMPs)

1. Minimum BMPs

The Discharger shall, to the extent feasible, implement and maintain all of the following minimum BMPs to reduce or prevent pollutants in industrial storm water discharges.¹²

a. Good Housekeeping

The Discharger shall:

- i. Observe all outdoor areas associated with industrial activity; including storm water discharge locations, drainage areas, conveyance systems, waste handling/disposal areas, and perimeter areas impacted by off-facility materials or storm water run-on to determine housekeeping needs. Any identified debris, waste, spills, tracked materials, or leaked materials shall be cleaned and disposed of properly;
- ii. Minimize or prevent material tracking;
- iii. Minimize dust generated from industrial materials or activities;
- iv. Ensure that all facility areas impacted by rinse/wash waters are cleaned as soon as possible;
- v. Cover all stored industrial materials that can be readily mobilized by contact with storm water;

¹² For the purposes of this General Permit, the requirement to implement BMPs "to the extent feasible" requires Dischargers to select, design, install and implement BMPs that reduce or prevent discharges of pollutants in their storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.

- vi. Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water;
 - vii. Prevent disposal of any rinse/wash waters or industrial materials into the storm water conveyance system;
 - viii. Minimize storm water discharges from non-industrial areas (e.g., storm water flows from employee parking area) that contact industrial areas of the facility; and,
 - ix. Minimize authorized NSWDS from non-industrial areas (e.g., potable water, fire hydrant testing, etc.) that contact industrial areas of the facility.
- b. Preventive Maintenance
- The Discharger shall:
- i. Identify all equipment and systems used outdoors that may spill or leak pollutants;
 - ii. Observe the identified equipment and systems to detect leaks, or identify conditions that may result in the development of leaks;
 - iii. Establish an appropriate schedule for maintenance of identified equipment and systems; and,
 - iv. Establish procedures for prompt maintenance and repair of equipment, and maintenance of systems when conditions exist that may result in the development of spills or leaks.
- c. Spill and Leak Prevention and Response
- The Discharger shall:
- i. Establish procedures and/or controls to minimize spills and leaks;
 - ii. Develop and implement spill and leak response procedures to prevent industrial materials from discharging through the storm water conveyance system. Spilled or leaked industrial materials shall be cleaned promptly and disposed of properly;
 - iii. Identify and describe all necessary and appropriate spill and leak response equipment, location(s) of spill and leak response equipment, and spill or leak response equipment maintenance procedures; and,
 - iv. Identify and train appropriate spill and leak response personnel.
- d. Material Handling and Waste Management

The Discharger shall:

- i. Prevent or minimize handling of industrial materials or wastes that can be readily mobilized by contact with storm water during a storm event;
- ii. Contain all stored non-solid industrial materials or wastes (e.g., particulates, powders, shredded paper, etc.) that can be transported or dispersed by the wind or contact with storm water;
- iii. Cover industrial waste disposal containers and industrial material storage containers that contain industrial materials when not in use;
- iv. Divert run-on and storm water generated from within the facility away from all stockpiled materials;
- v. Clean all spills of industrial materials or wastes that occur during handling in accordance with the spill response procedures (Section X.H.1.c); and,
- vi. Observe and clean as appropriate, any outdoor material or waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes.

e. Erosion and Sediment Controls

For each erodible surface facility location identified in the SWPPP (Section X.G.1.f), the Discharger shall:

- i. Implement effective wind erosion controls;
- ii. Provide effective stabilization for inactive areas, finished slopes, and other erodible areas prior to a forecasted storm event;
- iii. Maintain effective perimeter controls and stabilize all site entrances and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site;
- iv. Divert run-on and storm water generated from within the facility away from all erodible materials; and,
- v. If sediment basins are implemented, ensure compliance with the design storm standards in Section X.H.6.

f. Employee Training Program

The Discharger shall:

- i. Ensure that all team members implementing the various compliance activities of this General Permit are properly trained to implement the requirements of this General Permit, including but not limited to: BMP implementation, BMP effectiveness evaluations, visual observations,

and monitoring activities. If a Discharger enters Level 1 status, appropriate team members shall be trained by a QISP;

- ii. Prepare or acquire appropriate training manuals or training materials;
 - iii. Identify which personnel need to be trained, their responsibilities, and the type of training they shall receive;
 - iv. Provide a training schedule; and,
 - v. Maintain documentation of all completed training classes and the personnel that received training in the SWPPP.
- g. Quality Assurance and Record Keeping

The Discharger shall:

- i. Develop and implement management procedures to ensure that appropriate staff implements all elements of the SWPPP, including the Monitoring Implementation Plan;
- ii. Develop a method of tracking and recording the implementation of BMPs identified in the SWPPP; and
- iii. Maintain the BMP implementation records, training records, and records related to any spills and clean-up related response activities for a minimum of five (5) years (Section XXI.J.4).

2. Advanced BMPs

- a. In addition to the minimum BMPs described in Section X.H.1, the Discharger shall, to the extent feasible, implement and maintain any advanced BMPs identified in Section X.G.2.b, necessary to reduce or prevent discharges of pollutants in its storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.
- b. Advanced BMPs may include one or more of the following BMPs:

- i. Exposure Minimization BMPs

These include storm resistant shelters (either permanent or temporary) that prevent the contact of storm water with the identified industrial materials or area(s) of industrial activity.

- ii. Storm Water Containment and Discharge Reduction BMPs

These include BMPs that divert, infiltrate, reuse, contain, retain, or reduce the volume of storm water runoff. Dischargers are

encouraged to utilize BMPs that infiltrate or reuse storm water where feasible.

iii. Treatment Control BMPs

This is the implementation of one or more mechanical, chemical, biologic, or any other treatment technology that will meet the treatment design standard.

iv. Other Advanced BMPs

Any additional BMPs not described in subsections b.i through iii above that are necessary to meet the effluent limitations of this General Permit.

3. Temporary Suspension of Industrial Activities

For facilities that plan to temporarily suspend industrial activities for ten (10) or more consecutive calendar days during a reporting year, the Discharger may also suspend monitoring if it is infeasible to conduct monitoring while industrial activities are suspended (e.g., the facility is not staffed, or the facility is remote or inaccessible) and the facility has been stabilized. The Discharger shall include in the SWPPP the BMPs necessary to achieve compliance with this General Permit during the temporary suspension of the industrial activity. Once all necessary BMPs have been implemented to stabilize the facility, the Discharger is not required to:

- a. Perform monthly visual observations (Section XI.A.1.a.); or,
- b. Perform sampling and analysis (Section XI.B.) if it is infeasible to do so (e.g. facility is remotely located).

The Discharger shall upload via SMARTS (7) seven calendar days prior to the planned temporary suspension of industrial activities:

- a. SWPPP revisions specifically addressing the facility stabilization BMPs;
- b. The justification for why monitoring is infeasible at the facility during the period of temporary suspension of industrial activities;
- c. The date the facility is fully stabilized for temporary suspension of industrial activities; and,
- d. The projected date that industrial activities will resume at the facility.

Upon resumption of industrial activities at the facility, the Discharger shall, via SMARTS, confirm and/or update the date the facility's industrial activities have resumed. At this time, the Discharger is required to resume all compliance activities under this General Permit.

The Regional Water Boards may review the submitted information pertaining to the temporary suspension of industrial activities. Upon review, the Regional Water Board may request revisions or reject the Discharger's request to temporarily suspend monitoring.

4. BMP Descriptions

- a. The Discharger shall ensure that the SWPPP identifies each BMP being implemented at the facility, including:
 - i. The pollutant(s) that the BMP is designed to reduce or prevent in industrial storm water discharges;
 - ii. The frequency, time(s) of day, or conditions when the BMP is scheduled for implementation;
 - iii. The locations within each area of industrial activity or industrial pollutant source where the BMP shall be implemented;
 - iv. The individual and/or position responsible for implementing the BMP;
 - v. The procedures, including maintenance procedures, and/or instructions to implement the BMP effectively;
 - vi. The equipment and tools necessary to implement the BMP effectively; and,
 - vii. The BMPs that may require more frequent visual observations beyond the monthly visual observations as described in Section XI.A.1.
- b. The Discharger shall ensure that the SWPPP identifies and justifies each minimum BMP or applicable advanced BMP not being implemented at the facility because they do not reflect best industry practice considering technological availability and economic practicability and achievability.
- c. The Discharger shall identify any BMPs described in subsection a above that are implemented in lieu of any of the minimum or applicable advanced BMPs.

5. BMP Summary Table

The Discharger shall prepare a table summarizing each identified area of industrial activity, the associated industrial pollutant sources, the industrial pollutants, and the BMPs being implemented.

6. Design Storm Standards for Treatment Control BMPs

All new treatment control BMPs employed by the Discharger to comply with Section X.H.2 Advanced BMPs and new sediment basins installed after the effective date of this order shall be designed to comply with design storm standards in this Section, except as provided in an Industrial Activity BMP Demonstration (Section XII.D.2.a). A Factor of Safety shall be incorporated into the design of all treatment control BMPs to ensure that storm water is sufficiently treated throughout the life of the treatment control BMPs. The design storm standards for treatment control BMPs are as follows:

- a. Volume-based BMPs: The Discharger, at a minimum, shall calculate¹³ the volume to be treated using one of the following methods:
 - i. The volume of runoff produced from an 85th percentile 24-hour storm event, as determined from local, historical rainfall records;
 - ii. The volume of runoff produced by the 85th percentile 24-hour storm event, determined as the maximized capture runoff volume for the facility, from the formula recommended in the Water Environment Federation's Manual of Practice;¹⁴ or,
 - iii. The volume of annual runoff required to achieve 80% or more treatment, determined in accordance with the methodology set forth in the latest edition of California Stormwater Best Management Practices Handbook¹⁵, using local, historical rainfall records.
- b. Flow-based BMPs: The Discharger shall calculate the flow needed to be treated using one of the following methods:
 - i. The maximum flow rate of runoff produced from a rainfall intensity of at least 0.2 inches per hour for each hour of a storm event;
 - ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from local historical rainfall records, multiplied by a factor of two; or,
 - iii. The maximum flow rate of runoff, as determined using local historical rainfall records, that achieves approximately the same reduction in total pollutant loads as would be achieved by treatment of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

¹³ All hydrologic calculations shall be certified by a California licensed professional engineer in accordance with the Professional Engineers Act (Bus. & Prof. Code § 6700, et seq).

¹⁴ Water Environment Federation (WEF). Manual of Practice No. 23/ ASCE Manual of Practice No. 87, cited in chapter 5 (1998 Edition) and Cited in Chapter 3 (2012 Edition) .

¹⁵ California Stormwater Quality Association. Stormwater Best Management Practice New Development and Redevelopment Handbook. < <http://www.casqa.org/> >. [as of July 3, 2013].

I. MONITORING IMPLEMENTATION PLAN

The Discharger shall prepare a Monitoring Implementation Plan in accordance with the requirements of this General Permit. The Monitoring Implementation Plan shall be included in the SWPPP and shall include the following items:

1. An identification of team members assigned to conduct the monitoring requirements;
2. A description of the following in accordance with Attachment H:
 - a. Discharge locations;
 - b. Visual observation procedures; and,
 - c. Visual observation response procedures related to monthly visual observations and sampling event visual observations.
3. Justifications for any of the following that are applicable to the facility:
 - a. Alternative discharge locations in accordance with Section XI.C.3;
 - b. Representative Sampling Reduction in accordance with Section XI.C.4; or,
 - c. Qualified Combined Samples in accordance with Section XI.C.5.
4. Procedures for field instrument calibration instructions, including calibration intervals specified by the manufacturer; and,
5. An example Chain of Custody form used when handling and shipping water quality samples to the lab.

XI. MONITORING

A. Visual Observations

1. Monthly Visual Observations
 - a. At least once per calendar month, the Discharger shall visually observe each drainage area for the following:
 - i. The presence or indications of prior, current, or potential unauthorized NSWDS and their sources;
 - ii. Authorized NSWDS, sources, and associated BMPs to ensure compliance with Section IV.B.3; and,

- iii. Outdoor industrial equipment and storage areas, outdoor industrial activities areas, BMPs, and all other potential source of industrial pollutants.
- b. The monthly visual observations shall be conducted during daylight hours of scheduled facility operating hours and on days without precipitation.
- c. The Discharger shall provide an explanation in the Annual Report for uncompleted monthly visual observations.

2. Sampling Event Visual Observations

Sampling event visual observations shall be conducted at the same time sampling occurs at a discharge location. At each discharge location where a sample is obtained, the Discharger shall observe the discharge of storm water associated with industrial activity.

- a. The Discharger shall ensure that visual observations of storm water discharged from containment sources (e.g. secondary containment or storage ponds) are conducted at the time that the discharge is sampled.
- b. Any Discharger employing volume-based or flow-based treatment BMPs shall sample any bypass that occurs while the visual observations and sampling of storm water discharges are conducted.
- c. The Discharger shall visually observe and record the presence or absence of floating and suspended materials, oil and grease, discolorations, turbidity, odors, trash/debris, and source(s) of any discharged pollutants.
- d. In the event that a discharge location is not visually observed during the sampling event, the Discharger shall record which discharge locations were not observed during sampling or that there was no discharge from the discharge location.
- e. The Discharger shall provide an explanation in the Annual Report for uncompleted sampling event visual observations.

3. Visual Observation Records

The Discharger shall maintain records of all visual observations. Records shall include the date, approximate time, locations observed, presence and probable source of any observed pollutants, name of person(s) that conducted the observations, and any response actions and/or additional SWPPP revisions necessary in response to the visual observations.

4. The Discharger shall revise BMPs as necessary when the visual observations indicate pollutant sources have not been adequately addressed in the SWPPP.

B. Sampling and Analysis

1. A Qualifying Storm Event (QSE) is a precipitation event that:
 - a. Produces a discharge for at least one drainage area; and,
 - b. Is preceded by 48 hours with no discharge from any drainage area.
2. The Discharger shall collect and analyze storm water samples from two (2) QSEs within the first half of each reporting year (July 1 to December 31), and two (2) QSEs within the second half of each reporting year (January 1 to June 30).
3. Compliance Group Participants are only required to collect and analyze storm water samples from one (1) QSE within the first half of each reporting year (July 1 to December 31) and one (1) QSE within the second half of the reporting year (January 1 to June 30).
4. Except as provided in Section XI.C.4 (Representative Sampling Reduction), samples shall be collected from each drainage area at all discharge locations. The samples must be:
 - a. Representative of storm water associated with industrial activities and any commingled authorized NSWDS; or,
 - b. Associated with the discharge of contained storm water.
5. Samples from each discharge location shall be collected within four (4) hours of:
 - a. The start of the discharge; or,
 - b. The start of facility operations if the QSE occurs within the previous 12-hour period (e.g., for storms with discharges that begin during the night for facilities with day-time operating hours). Sample collection is required during scheduled facility operating hours and when sampling conditions are safe in accordance with Section XI.C.6.a.ii.
6. The Discharger shall analyze all collected samples for the following parameters:
 - a. Total suspended solids (TSS) and oil and grease (O&G);
 - b. pH (see Section XI.C.2);

- c. Additional parameters identified by the Discharger on a facility-specific basis that serve as indicators of the presence of all industrial pollutants identified in the pollutant source assessment (Section X.G.2). These additional parameters may be modified (added or removed) in accordance with any updated SWPPP pollutant source assessment;
 - d. Additional applicable parameters listed in Table 1 below. These parameters are dependent on the facility Standard Industrial Classification (SIC) code(s);
 - e. Additional applicable industrial parameters related to receiving waters with 303(d) listed impairments or approved TMDLs based on the assessment in Section X.G.2.a.ix. Test methods with lower detection limits may be necessary when discharging to receiving waters with 303(d) listed impairments or TMDLs;
 - f. Additional parameters required by the Regional Water Board. The Discharger shall contact its Regional Water Board to determine appropriate analytical test methods for parameters not listed in Table 2 below. These analytical test methods will be added to SMARTS; and
 - g. For discharges subject to Subchapter N, additional parameters specifically required by Subchapter N. If the discharge is subject to ELGs, the Dischargers shall contact the Regional Water Board to determine appropriate analytical methods for parameters not listed in Table 2 below.
7. The Discharger shall select corresponding NALs, analytical test methods,, and reporting units from the list provided in Table 2 below. SMARTS will be updated over time to add additional acceptable analytical test methods. Dischargers may propose an analytical test method for any parameter or pollutant that does not have an analytical test method specified in Table 2 or in SMARTS. Dischargers may also propose analytical test methods with substantially similar or more stringent method detection limits than existing approved analytical test methods. Upon approval, the analytical test method will be added to SMARTS.
 8. The Discharger shall ensure that the collection, preservation and handling of all storm water samples are in accordance with Attachment H, Storm Water Sample Collection and Handling Instructions.
 9. Samples from different discharge locations shall not be combined or composited except as allowed in Section XI.C.5 (Qualified Combined Samples).
 10. The Discharger shall ensure that all laboratory analyses are conducted according to test procedures under 40 Code of Federal Regulations part 136, including the observation of holding times, unless other test procedures have been specified in this General Permit or by the Regional Water Board.

11. Sampling Analysis Reporting

- a. The Discharger shall submit all sampling and analytical results for all individual or Qualified Combined Samples via SMARTS within 30 days of obtaining all results for each sampling event.
- b. The Discharger shall provide the method detection limit when an analytical result from samples taken is reported by the laboratory as a "non-detect" or less than the method detection limit. A value of zero shall not be reported.
- c. The Discharger shall provide the analytical result from samples taken that is reported by the laboratory as below the minimum level (often referred to as the reporting limit) but above the method detection limit.

Reported analytical results will be averaged automatically by SMARTS. For any calculations required by this General Permit, SMARTS will assign a value of zero (0) for all results less than the minimum level as reported by the laboratory.

TABLE 1: Additional Analytical Parameters

SIC code	SIC code Description	Parameters*
102X	Copper Ores	COD; N+N
12XX	Coal Mines	Al; Fe
144X	Sand and Gravel	N+N
207X	Fats and Oils	BOD; COD; N+N
2421	Sawmills & Planning Mills	COD; Zn
2426	Hardwood Dimension	COD
2429	Special Product Sawmills	COD
243X	Millwork, Veneer, Plywood	COD
244X	Wood Containers	COD
245X	Wood Buildings & Mobile Homes	COD
2491	Wood Preserving	As; Cu
2493	Reconstituted Wood Products	COD
263X	Paperboard Mills	COD
281X	Industrial Inorganic Chemicals	Al; Fe; N+N
282X	Plastic Materials, Synthetics	Zn
284X	Soaps, Detergents, Cosmetics	N+N; Zn
287X	Fertilizers, Pesticides, etc.	Fe; N+N; Pb; Zn; P
301X	Tires, Inner Tubes	Zn
302X	Rubber and Plastic Footwear	Zn
305X	Rubber & Plastic Sealers & Hoses	Zn
306X	Misc. Fabricated Rubber Products	Zn
325X	Structural Clay Products	Al
326X	Pottery & Related Products	Al
3297	Non-Clay Refractories	Al
327X	Concrete, Gypsum, Plaster Products (Except 3274)	Fe
3295	Minerals & Earths	Fe
331X	Steel Works, Blast Furnaces, Rolling and Finishing Mills	Al; Zn
332X	Iron and Steel Foundries	Al; Cu; Fe; Zn
335X	Metal Rolling, Drawing, Extruding	Cu; Zn

336X	Nonferrous Foundries (Castings)	Cu; Zn
34XX	Fabricated Metal Products (Except 3479)	Zn; N+N; Fe; Al
3479	Coating and Engraving	Zn; N+N
4953	Hazardous Waste Facilities	NH ₃ ; Mg; COD; As; Cn; Pb; HG; Se; Ag
44XX	Water Transportation	Al; Fe; Pb; Zn
45XX	Air Transportation Facilities ¹⁶	BOD; COD; NH ₃
4911	Steam Electric Power Generating Facilities	Fe
4953	Landfills and Land Application Facilities	Fe
5015	Dismantling or Wrecking Yards	Fe; Pb; Al
5093	Scrap and Waste Materials (not including source-separated recycling)	Fe; Pb; Al; Zn; COD

*Table 1 Parameter Reference	
Ag – Silver	Mg – Magnesium
Al – Aluminum	N+N - Nitrate & Nitrite Nitrogen
As – Arsenic	NH – Ammonia
BOD – Biochemical Oxygen Demand	Ni – Nickel
Cd - Cadmium	P – Phosphorus
Cn – Cyanide	Se – Selenium
COD – Chemical Oxygen Demand	TSS – Total Suspended Solids
Cu – Copper	Zn – Zinc
Fe – Iron	Pb – Lead
Hg – Mercury	

¹⁶ Only airports (SIC 4512-4581) where a single Discharger, or a combination of permitted facilities use more than 100,000 gallons of glycol-based deicing chemicals and/or 100 tons or more of urea on an average annual basis, are required to monitor these parameters for those outfalls that collect runoff from areas where deicing activities occur.

TABLE 2: Parameter NAL Values, Test Methods, and Reporting Units

PARAMETER	TEST METHOD	REPORTING UNITS	ANNUAL NAL	INSTANTANEOUS MAXIMUM NAL
pH*	See Section XI.C.2	pH units	N/A	Less than 6.0 Greater than 9.0
Suspended Solids (TSS)*, Total	SM 2540-D	mg/L	100	400
Oil & Grease (O&G)*, Total	EPA 1664A	mg/L	15	25
Zinc, Total (H)	EPA 200.8	mg/L	0.26**	
Copper, Total (H)	EPA 200.8	mg/L	0.0332**	
Cyanide, Total	SM 4500–CN C, D, or E	mg/L	0.022	
Lead, Total (H)	EPA 200.8	mg/L	0.262**	
Chemical Oxygen Demand (COD)	SM 5220C	mg/L	120	
Aluminum, Total	EPA 200.8	mg/L	0.75	
Iron, Total	EPA 200.7	mg/L	1.0	
Nitrate + Nitrite Nitrogen	SM 4500-NO3- E	mg/L as N	0.68	
Total Phosphorus	SM 4500-P B+E	mg/L as P	2.0	
Ammonia (as N)	SM 4500-NH3 B+ C or E	mg/L	2.14	
Magnesium, total	EPA 200.7	mg/L	0.064	
Arsenic, Total (c)	EPA 200.8	mg/L	0.15	
Cadmium, Total (H)	EPA 200.8	mg/L	0.0053**	
Nickel, Total (H)	EPA 200.8	mg/l	1.02**	
Mercury, Total	EPA 245.1	mg/L	0.0014	
Selenium, Total	EPA 200.8	mg/L	0.005	
Silver, Total (H)	EPA 200.8	mg/L	0.0183**	
Biochemical Oxygen Demand (BOD)	SM 5210B	mg/L	30	

SM – Standard Methods for the Examination of Water and Wastewater, 18th edition

EPA – U.S. EPA test methods

(H) – Hardness dependent

* Minimum parameters required by this General Permit

**The NAL is the highest value used by U.S. EPA based on their hardness table in the 2008 MSGP.

C. Methods and Exceptions

1. The Discharger shall comply with the monitoring methods in this General Permit and Attachment H.
2. pH Methods
 - a. Dischargers that are not subject to Subchapter N ELGs mandating pH analysis related to acidic or alkaline sources and have never entered Level 1 status for pH, are eligible to screen for pH using wide range litmus pH paper or other equivalent pH test kits. The pH screen shall be performed as soon as practicable, but no later than 15 minutes after the sample is collected.
 - b. Dischargers subject to Subchapter N ELGs shall either analyze samples for pH using methods in accordance with 40 Code of Federal Regulations 136 for testing storm water or use a calibrated portable instrument for pH.
 - c. Dischargers that enter Level 1 status (see Section XII.C) for pH shall, in the subsequent reporting years, analyze for pH using methods in accordance with 40 Code of Federal Regulations 136 or use a calibrated portable instrument for pH.
 - d. Dischargers using a calibrated portable instrument for pH shall ensure that all field measurements are conducted in accordance with the accompanying manufacturer's instructions.
3. Alternative Discharge Locations
 - a. The Discharger is required to identify, when practicable, alternative discharge locations for any discharge locations identified in accordance with Section XI.B.4 if the facility's discharge locations are:
 - i. Affected by storm water run-on from surrounding areas that cannot be controlled; and/or,
 - ii. Difficult to observe or sample (e.g. submerged discharge outlets, dangerous discharge location accessibility).
 - b. The Discharger shall submit and certify via SMARTS any alternative discharge location or revisions to the alternative discharge locations in the Monitoring Implementation Plan.
4. Representative Sampling Reduction
 - a. The Discharger may reduce the number of locations to be sampled in each drainage area (e.g., roofs with multiple downspouts, loading/unloading areas with multiple storm drains) if the industrial

activities, BMPs, and physical characteristics (grade, surface materials, etc.) of the drainage area for each location to be sampled are substantially similar to one another. To qualify for the Representative Sampling Reduction, the Discharger shall provide a Representative Sampling Reduction justification in the Monitoring Implementation Plan section of the SWPPP.

- b. The Representative Sampling Reduction justification shall include:
 - i. Identification and description of each drainage area and corresponding discharge location(s);
 - ii. A description of the industrial activities that occur throughout the drainage area;
 - iii. A description of the BMPs implemented in the drainage area;
 - iv. A description of the physical characteristics of the drainage area;
 - v. A rationale that demonstrates that the industrial activities and physical characteristics of the drainage area(s) are substantially similar; and,
 - vi. An identification of the discharge location(s) selected for representative sampling, and rationale demonstrating that the selected location(s) to be sampled are representative of the discharge from the entire drainage area.
- c. A Discharger that satisfies the conditions of subsection 4.b.i through v above shall submit and certify via SMARTS the revisions to the Monitoring Implementation Plan that includes the Representative Sampling Reduction justification.
- d. Upon submittal of the Representative Sampling Reduction justification, the Discharger may reduce the number of locations to be sampled in accordance with the Representative Sampling Reduction justification. The Regional Water Board may reject the Representative Sampling Reduction justification and/or request additional supporting documentation. In such instances, the Discharger is ineligible for the Representative Sampling Reduction until the Regional Water Board approves the Representative Sampling Reduction justification.

5. Qualified Combined Samples

- a. The Discharger may authorize an analytical laboratory to combine samples of equal volume from as many as four (4) discharge locations if the industrial activities, BMPs, and physical characteristics (grade, surface materials, etc.) within each of the drainage areas are substantially similar to one another.

- b. The Qualified Combined Samples justification shall include:
 - i. Identification and description of each drainage area and corresponding discharge locations;
 - ii. A description of the BMPs implemented in the drainage area;
 - iii. A description of the industrial activities that occur throughout the drainage area;
 - iv. A description of the physical characteristics of the drainage area; and,
 - v. A rationale that demonstrates that the industrial activities and physical characteristics of the drainage area(s) are substantially similar.
- c. A Discharger that satisfies the conditions of subsection 5.b.i through iv above shall submit and certify via SMARTS the revisions to the Monitoring Implementation Plan that includes the Qualified Combined Samples justification.
- d. Upon submittal of the Qualified Combined Samples justification revisions in the Monitoring Implementation Plan, the Discharger may authorize the lab to combine samples of equal volume from as many as four (4) drainage areas. The Regional Water Board may reject the Qualified Combined Samples justification and/or request additional supporting documentation. In such instances, the Discharger is ineligible for the Qualified Combined Samples justification until the Regional Water Board approves the Qualified Combined Samples justification.
- e. Regional Water Board approval is necessary to combine samples from more than four (4) discharge locations.

6. Sample Collection and Visual Observation Exceptions

- a. Sample collection and visual observations are not required under the following conditions:
 - i. During dangerous weather conditions such as flooding or electrical storms; or,
 - ii. Outside of scheduled facility operating hours. The Discharger is not precluded from collecting samples or conducting visual observations outside of scheduled facility operating hours.
- b. In the event that samples are not collected, or visual observations are not conducted in accordance with Section XI.B.5 due to these exceptions, an explanation shall be included in the Annual Report.

- c. Sample collection is not required for drainage areas with no exposure to industrial activities and materials in accordance with the definitions in Section XVII.
7. Sampling Frequency Reduction Certification
- a. Dischargers are eligible to reduce the number of QSEs sampled each reporting year in accordance with the following requirements:
 - i. Results from four (4) consecutive QSEs that were sampled (QSEs may be from different reporting years) did not exceed any NALs as defined in Section XII.A; and
 - ii. The Discharger is in full compliance with the requirements of this General Permit and has updated, certified and submitted via SMARTS all documents, data, and reports required by this General Permit during the time period in which samples were collected.
 - b. The Regional Water Board may notify a Discharger that it may not reduce the number of QSEs sampled each reporting year if the Discharger is subject to an enforcement action.
 - c. An eligible Discharger shall certify via SMARTS that it meets the conditions in subsection 7.a above.
 - d. Upon Sampling Frequency Reduction certification, the Discharger shall collect and analyze samples from one (1) QSE within the first half of each reporting year (July 1 to December 31), and one (1) QSE within the second half of each reporting year (January 1 to June 30). All other monitoring, sampling, and reporting requirements remain in effect.
 - e. Dischargers who participate in a Compliance Group and certify a Sampling Frequency Reduction are only required to collect and analyze storm water samples from one (1) QSE within each reporting year.
 - f. A Discharger may reduce sampling per the Sampling Frequency Reduction certification unless notified by the Regional Water Board that: (1) the Sampling Frequency Reduction certification has been rejected or (2) additional supporting documentation must be submitted. In such instances, a Discharger is ineligible for the Sampling Frequency Reduction until the Regional Water Board provides Sampling Frequency Reduction certification approval. Revised Sampling Frequency Reduction certifications shall be certified and submitted via SMARTS by the Discharger.
 - g. A Discharger loses its Sampling Frequency Reduction certification if an NAL exceedance occurs (Section XII.A).

D. Facilities Subject to Federal Storm Water Effluent Limitation Guidelines (ELGs)

1. In addition to the other requirements in this General Permit, Dischargers with facilities subject to storm water ELGs in Subchapter N shall:
 - a. Collect and analyze samples from QSEs for each regulated pollutant specified in the appropriate category in Subchapter N as specified in Section XI.B;
 - b. For Dischargers with facilities subject to 40 Code of Federal Regulations parts 419¹⁷ and 443¹⁸, estimate or calculate the volume of industrial storm water discharges from each drainage area subject to the ELGs and the mass of each regulated pollutant as defined in parts 419 and 443; and,
 - c. Ensure that the volume/mass estimates or calculations required in subsection b are completed by a California licensed professional engineer.
2. Dischargers subject to Subchapter N shall submit the information in Section XI.D.1.a through c in their Annual Report.
3. Dischargers with facilities subject to storm water ELGs in Subchapter N are ineligible for the Representative Sampling Reduction in Section XI.C.4.

XII. EXCEEDANCE RESPONSE ACTIONS (ERAs)

A. NALs and NAL Exceedances

The Discharger shall perform sampling, analysis and reporting in accordance with the requirements of this General Permit and shall compare the results to the two types of NAL values in Table 2 to determine whether either type of NAL has been exceeded for each applicable parameter. The two types of potential NAL exceedances are as follows:

1. Annual NAL exceedance: The Discharger shall determine the average concentration for each parameter using the results of all the sampling and analytical results for the entire facility for the reporting year (i.e., all "effluent" data). The Discharger shall compare the average concentration for each parameter to the corresponding annual NAL values in Table 2. For Dischargers using composite sampling or flow-weighted measurements in accordance with standard practices, the average concentrations shall be calculated in accordance with the U.S. EPA's NPDES Storm Water

¹⁷ Part 419 - Petroleum refining point source category

¹⁸ Part 443 - Effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources for the paving and roofing materials (tars and asphalt) point source category

Sampling Guidance Document.¹⁹ An annual NAL exceedance occurs when the average of all the analytical results for a parameter from samples taken within a reporting year exceeds the annual NAL value for that parameter listed in Table 2; and,

2. Instantaneous maximum NAL exceedance: The Discharger shall compare all sampling and analytical results from each distinct sample (individual or combined as authorized by XI.C.5) to the corresponding instantaneous maximum NAL values in Table 2. An instantaneous maximum NAL exceedance occurs when two (2) or more analytical results from samples taken for any single parameter within a reporting year exceed the instantaneous maximum NAL value (for TSS and O&G) or are outside of the instantaneous maximum NAL range for pH.

B. Baseline Status

At the beginning of a Discharger's NOI Coverage, all Dischargers have Baseline status for all parameters.

C. Level 1 Status

A Discharger's Baseline status for any given parameter shall change to Level 1 status if sampling results indicate an NAL exceedance for that same parameter. Level 1 status will commence on July 1 following the reporting year during which the exceedance(s) occurred.²⁰

1. Level 1 ERA Evaluation

- a. By October 1 following commencement of Level 1 status for any parameter with sampling results indicating an NAL exceedance, the Discharger shall:
 - b. Complete an evaluation, with the assistance of a QISP, of the industrial pollutant sources at the facility that are or may be related to the NAL exceedance(s); and,
 - c. Identify in the evaluation the corresponding BMPs in the SWPPP and any additional BMPs and SWPPP revisions necessary to prevent future NAL exceedances and to comply with the requirements of this General Permit. Although the evaluation may focus on the drainage areas where the NAL exceedance(s) occurred, all drainage areas shall be evaluated.

2. Level 1 ERA Report

¹⁹ U.S. EPA. NPDES Storm Water Sampling Guidance Document. <<http://www.epa.gov/npdes/pubs/owm0093.pdf>>. [as of February 4, 2014]

²⁰ For all sampling results reported before June 30th of the preceding reporting year. If sample results indicating an NAL exceedance are submitted after June 30th, the Discharger will change status once those results have been reported.

- a. Based upon the above evaluation, the Discharger shall, as soon as practicable but no later than January 1 following commencement of Level 1 status :
 - i. Revise the SWPPP as necessary and implement any additional BMPs identified in the evaluation;
 - ii. Certify and submit via SMARTS a Level 1 ERA Report prepared by a QISP that includes the following:
 - 1) A summary of the Level 1 ERA Evaluation required in subsection C.1 above; and,
 - 2) A detailed description of the SWPPP revisions and any additional BMPs for each parameter that exceeded an NAL.
 - iii. Certify and submit via SMARTS the QISP's identification number, name, and contact information (telephone number, e-mail address).
 - b. A Discharger's Level 1 status for a parameter will return to Baseline status once a Level 1 ERA report has been completed, all identified additional BMPs have been implemented, and results from four (4) consecutive QSEs that were sampled subsequent to BMP implementation indicate no additional NAL exceedances for that parameter.
3. NAL Exceedances Prior to Implementation of Level 1 Status BMPs.

Prior to the implementation of an additional BMP identified in the Level 1 ERA Evaluation or October 1, whichever comes first, sampling results for any parameter(s) being addressed by that additional BMP will not be included in the calculations of annual average or instantaneous NAL exceedances in SMARTS.

D. Level 2 Status

A Discharger's Level 1 status for any given parameter shall change to Level 2 status if sampling results indicate an NAL exceedance for that same parameter while the Discharger is in Level 1. Level 2 status will commence on July 1 following the reporting year during which the NAL exceedance(s) occurred.²¹

1. Level 2 ERA Action Plan

²¹ For all sampling results reported before June 30th of the preceding reporting year. If sample results indicating an NAL exceedance are submitted after June 30th, the Discharger will change status upon the date those results have been reported into SMARTS.

- a. Dischargers with Level 2 status shall certify and submit via SMARTS a Level 2 ERA Action Plan prepared by a QISP that addresses each new Level 2 NAL exceedance by January 1 following the reporting year during which the NAL exceedance(s) occurred. For each new Level 2 NAL exceedance, the Level 2 Action Plan will identify which of the demonstrations in subsection D.2.a through c the Discharger has selected to perform. A new Level 2 NAL exceedance is any Level 2 NAL exceedance for 1) a new parameter in any drainage area, or 2) the same parameter that is being addressed in an existing Level 2 ERA Action Plan in a different drainage area.
- b. The Discharger shall certify and submit via SMARTS the QISP's identification number, name, and contact information (telephone number, e-mail address) if this information has changed since previous certifications.
- c. The Level 2 ERA Action Plan shall at a minimum address the drainage areas with corresponding Level 2 NAL exceedances.
- d. All elements of the Level 2 ERA Action Plan shall be implemented as soon as practicable and completed no later than 1 year after submitting the Level 2 ERA Action Plan.
- e. The Level 2 ERA Action Plan shall include a schedule and a detailed description of the tasks required to complete the Discharger's selected demonstration(s) as described below in Section D.2.a through c.

2. Level 2 ERA Technical Report

On January 1 of the reporting year following the submittal of the Level 2 ERA Action Plan, a Discharger with Level 2 status shall certify and submit a Level 2 ERA Technical Report prepared by a QISP that includes one or more of the following demonstrations:

a. Industrial Activity BMPs Demonstration

This shall include the following requirements, as applicable:

- i. Shall include a description of the industrial pollutant sources and corresponding industrial pollutants that are or may be related to the NAL exceedance(s);
- ii. Shall include an evaluation of all pollutant sources associated with industrial activity that are or may be related to the NAL exceedance(s);
- iii. Where all of the Discharger's implemented BMPs, including additional BMPs identified in the Level 2 ERA Action Plan, achieve

compliance with the effluent limitations of this General Permit and are expected to eliminate future NAL exceedance(s), the Discharger shall provide a description and analysis of all implemented BMPs;

- iv. In cases where all of the Discharger's implemented BMPs, including additional BMPs identified in the Level 2 ERA Action Plan, achieve compliance with the effluent limitations of this General Permit but are not expected to eliminate future NAL exceedance(s), the Discharger shall provide, in addition to a description and analysis of all implemented BMPs:
 - 1) An evaluation of any additional BMPs that would reduce or prevent NAL exceedances;
 - 2) Estimated costs of the additional BMPs evaluated; and,
 - 3) An analysis describing the basis for the selection of BMPs implemented in lieu of the additional BMPs evaluated but not implemented.
 - v. The description and analysis of BMPs required in subsection a.iii above shall specifically address the drainage areas where the NAL exceedance(s) responsible for the Discharger's Level 2 status occurred, although any additional Level 2 ERA Action Plan BMPs may be implemented for all drainage areas; and,
 - vi. If an alternative design storm standard for treatment control BMPs (in lieu of the design storm standard for treatment control BMPs in Section X.H.6 in this General Permit) will achieve compliance with the effluent limitations of this General Permit, the Discharger shall provide an analysis describing the basis for the selection of the alternative design storm standard.
- b. Non-Industrial Pollutant Source Demonstration

This shall include:

- i. A statement that the Discharger has determined that the exceedance of the NAL is attributable solely to the presence of non-industrial pollutant sources. (The pollutant may also be present due to industrial activities, in which case the Discharger must demonstrate that the pollutant contribution from the industrial activities by itself does not result in an NAL exceedance.) The sources shall be identified as either run-on from adjacent properties, aerial deposition from man-made sources, or as generated by on-site non-industrial sources;

- ii. A statement that the Discharger has identified and evaluated all potential pollutant sources that may have commingled with storm water associated with the Discharger's industrial activity and may be contributing to the NAL exceedance;
 - iii. A description of any on-site industrial pollutant sources and corresponding industrial pollutants that are contributing to the NAL exceedance;
 - iv. An assessment of the relative contributions of the pollutant from (1) storm water run-on to the facility from adjacent properties or non-industrial portions of the Discharger's property or from aerial deposition and (2) the storm water associated with the Discharger's industrial activity;
 - v. A summary of all existing BMPs for that parameter; and,
 - vi. An evaluation of all on-site/off-site analytical monitoring data demonstrating that the NAL exceedances are caused by pollutants in storm water run-on to the facility from adjacent properties or non-industrial portions of the Discharger's property or from aerial deposition.
- c. Natural Background Pollutant Source Demonstration

This shall include:

- i. A statement that the Discharger has determined that the NAL exceedance is attributable solely to the presence of the pollutant in the natural background that has not been disturbed by industrial activities. (The pollutant may also be present due to industrial activities, in which case the Discharger must demonstrate that the pollutant contribution from the industrial activities by itself does not result in an NAL exceedance);
- ii. A summary of all data previously collected by the Discharger, or other identified data collectors, that describes the levels of natural background pollutants in the storm water discharge;
- iii. A summary of any research and published literature that relates the pollutants evaluated at the facility as part of the Natural Background Source Demonstration;
- iv. Map showing the reference site location in relation to facility along with available land cover information;
- v. Reference site and test site elevation;

- vi. Available geology and soil information for reference and test sites;
- vii. Photographs showing site vegetation;
- viii. Site reconnaissance survey data regarding presence of roads, outfalls, or other human-made structures; and,
- ix. Records from relevant state or federal agencies indicating no known mining, forestry, or other human activities upstream of the proposed reference site.

3. Level 2 ERA Technical Report Submittal

- a. The Discharger shall certify and submit via SMARTS the Level 2 ERA Technical Report described in Section D.2 above.
- b. The State Water Board and Regional Boards (Water Boards) may review the submitted Level 2 ERA Technical Reports. Upon review of a Level 2 ERA Technical Report, the Water Boards may reject the Level 2 ERA Technical Report and direct the Discharger to take further action(s) to comply with this General Permit.
- c. Dischargers with Level 2 status who have submitted the Level 2 ERA Technical Report are only required to annually update the Level 2 ERA Technical Report based upon additional NAL exceedances of the same parameter and same drainage area (if the original Level 2 ERA Technical Report contained an Industrial Activity BMP Demonstration and the implemented BMPs were expected to eliminate future NAL exceedances in accordance with Section XII.D.2.a.ii), facility operational changes, pollutant source(s) changes, and/or information that becomes available via compliance activities (monthly visual observations, sampling results, annual evaluation, etc.). The Level 2 ERA Technical Report shall be prepared by a QISP and be certified and submitted via SMARTS by the Discharger with each Annual Report. If there are no changes prompting an update of the Level 2 ERA Technical Report, as specified above, the Discharger will provide this certification in the Annual Report that there have been no changes warranting re-submittal of the Level 2 ERA Technical Report.
- d. Dischargers are not precluded from submitting a Level 2 ERA Action Plan or ERA Technical Report prior to entering Level 2 status if information is available to adequately prepare the report and perform the demonstrations described above. A Discharger who chooses to submit a Level 2 ERA Action Plan or ERA Technical Report prior to entering Level 2 status will automatically be placed in Level 2 in accordance to the Level 2 ERA schedule.

4. Eligibility for Returning to Baseline Status

- a. Dischargers with Level 2 status who submit an Industrial Activity BMPs Demonstration in accordance with subsection 2.a.i through iii above and have implemented BMPs to prevent future NAL exceedance(s) for the Level 2 parameter(s) shall return to baseline status for that parameter, if results from four (4) subsequent consecutive QSEs sampled indicate no additional NAL exceedance(s) for that parameter(s). If future NAL exceedances occur for the same parameter(s), the Discharger's Baseline status will return to Level 2 status on July 1 in the subsequent reporting year during which the NAL exceedance(s) occurred. These Dischargers shall update the Level 2 ERA Technical Report as required above in Section D.3.c.
- b. Dischargers are ineligible to return to baseline status if they submit any of the following:
 - i. A industrial activity BMP demonstration in accordance with subsection 2.a.iv above;
 - ii. An non-industrial pollutant source demonstration; or,
 - iii. A natural background pollutant source demonstration.

5. Level 2 ERA Implementation Extension

- a. Dischargers that need additional time to submit the Level 2 ERA Technical Report shall be automatically granted a single time extension for up to six (6) months upon submitting the following items into SMARTS, as applicable:
 - i. Reasons for the time extension;
 - ii. A revised Level 2 ERA Action Plan including a schedule and a detailed description of the necessary tasks still to be performed to complete the Level 2 ERA Technical Report; and
 - iii. A description of any additional temporary BMPs that will be implemented while permanent BMPs are being constructed.
- b. The Regional Water Boards will review Level 2 ERA Implementation Extensions for completeness and adequacy. Requests for extensions that total more than six (6) months are not granted unless approved in writing by the Water Boards. The Water Boards may (1) reject or revise the time allowed to complete Level 2 ERA Implementation Extensions, (2) identify additional tasks necessary to complete the Level 2 ERA Technical Report, and/or (3) require the Discharger to implement additional temporary BMPs.

XIII. INACTIVE MINING OPERATION CERTIFICATION

- A.** Inactive mining operations are defined in Part 3 of Attachment A of this General Permit. The Discharger may, in lieu of complying with the General Permit requirements described in subsection B below, certify and submit via SMARTS that their inactive mining operation meets the following conditions:
1. The Discharger has determined and justified in the SWPPP that it is impracticable to implement the monitoring requirements in this General Permit for the inactive mining operation;
 2. A SWPPP has been signed (wet signature and license number) by a California licensed professional engineer and is being implemented in accordance with the requirements of this General Permit; and,
 3. The facility is in compliance with this General Permit, except as provided in subsection B below.
- B.** The Discharger who has certified and submitted that they meet the conditions in subsection A above, are not subject to the following General Permit requirements:
1. Monitoring Implementation Plan in Section X.I;
 2. Monitoring Requirements in Section XI;
 3. Exceedance Response Actions (ERAs) in Section XII; and,
 4. Annual Report Requirements in Section XVI.
- C.** Inactive Mining Operation Certification Submittal Schedule
1. The Discharger shall certify and submit via SMARTS NOI coverage PRDs listed in Section II.B.1 and meet the conditions in subsection A above.
 2. The Discharger shall annually inspect the inactive mining site and certify via SMARTS no later than July 15th of each reporting year, that their inactive mining operation continues to meet the conditions in subsection A above.
 3. The Discharger shall have a California licensed professional engineer review and update the SWPPP if there are changes to their inactive mining operation or additional BMPs are needed to comply with this General Permit. Any significant updates to the SWPPP shall be signed (wet signature and license number) by a California license professional engineer.
 4. The Discharger shall certify and submit via SMARTS any significantly revised SWPPP within 30 days of the revision(s).

XIV. COMPLIANCE GROUPS AND COMPLIANCE GROUP LEADERS

A. Compliance Group Qualification Requirements

1. Any group of Dischargers of the same industry type or any QISP representing Dischargers of the same industry type may form a Compliance Group. A Compliance Group shall consist of Dischargers that operate facilities with similar types of industrial activities, pollutant sources, and pollutant characteristics (e.g., scrap metals recyclers would join a different group than paper recyclers, truck vehicle maintenance facilities would join a different group than airplane vehicle maintenance facilities, etc.). A Discharger participating in a Compliance Group is termed a Compliance Group Participant. Participation in a Compliance Group is not required. Compliance Groups may be formed at any time.
2. Each Compliance Group shall have a Compliance Group Leader.
3. To establish a Compliance Group, the Compliance Group Leader shall register as a Compliance Group Leader via SMARTS. The registration shall include documentation demonstrating compliance with the Compliance Group qualification requirements above and a list of the Compliance Group Participants.
4. Each Compliance Group Participant shall register as a member of an established Compliance Group via SMARTS.
5. The Executive Director of the State Water Board may review Compliance Group registrations and/or activities for compliance with the requirements of this General Permit. The Executive Director may reject the Compliance Group, the Compliance Group Leader, or individual Compliance Group Participants within the Compliance Group.

B. Compliance Group Leader Responsibilities

1. A Compliance Group Leader must complete a State Water Board sponsored or approved training program for Compliance Group Leaders.
2. The Compliance Group Leader shall assist Compliance Group Participants with all compliance activities required by this General Permit.
3. A Compliance Group Leader shall prepare a Consolidated Level 1 ERA Report for all Compliance Group Participants with Level 1 status for the same parameter. Compliance Group Participants who certify and submit these Consolidated Level 1 ERA Reports are subject to the same provisions as individual Dischargers with Level 1 status, as described in Section XII.C. A Consolidated Level 1 ERA Report is equivalent to a Level 1 ERA Report.

4. The Compliance Group Leader shall update the Consolidated Level 1 ERA Report as needed to address additional Compliance Group Participants with ERA Level 1 status.
5. A Compliance Group Leader shall prepare a Level 2 ERA Action Plan specific to each Compliance Group Participant with Level 2 status. Compliance Group Participants who certify and submit these Level 2 ERA Action Plans are subject to the same provisions as individual Dischargers with Level 2 status, as described in Section XII.D.
6. A Compliance Group Leader shall prepare a Level 2 ERA Technical Report specific to each Compliance Group Participant with Level 2 status. Compliance Group Participants who certify and submit these Level 2 ERA Technical Reports are subject to the same provisions as individual Dischargers with Level 2 status, as described in Section XII.D.
7. The Compliance Group Leader shall inspect all the facilities of the Compliance Group Participants that have entered Level 2 status prior to preparing the individual Level 2 ERA Technical Report.
8. The Compliance Group Leader shall revise the Consolidated Level 1 ERA Report, individual Level 2 ERA Action Plans, or individual Level 2 Technical Reports in accordance with any comments received from the Water Boards.
9. The Compliance Group Leader shall inspect all the facilities of the Compliance Group Participants at a minimum of once per reporting year (July 1 to June 30).

C. Compliance Group Participant Responsibilities

1. Each Compliance Group Participant is responsible for permit compliance for the Compliance Group Participant's facility and for ensuring that the Compliance Group Leader's activities related to the Compliance Group Participant's facility comply with this General Permit.
2. Compliance Group Participants with Level 1 status shall certify and submit via SMARTS the Consolidated Level 1 ERA Report. The Compliance Group Participants shall certify that they have reviewed the Consolidated Level 1 ERA Report and have implemented any required additional BMPs. Alternatively, the Compliance Group Participant may submit an individual Level 1 ERA Report in accordance with the provisions in Section XII.C.2.
3. Compliance Group Participants with Level 2 status shall certify and submit via SMARTS their individual Level 2 ERA Action Plan and Technical Report prepared by their Compliance Group Leader. Each Compliance Group Participant shall certify that they have reviewed the Level 2 ERA Action Plan and Technical Report and will implement any required additional BMPs.

4. Compliance Group Participants can at any time discontinue their participation in their associated Compliance Group via SMARTS. Upon discontinuation, the former Compliance Group Participant is immediately subject to the sampling and analysis requirements described in Section XI.B.2.

XV. ANNUAL COMPREHENSIVE FACILITY COMPLIANCE EVALUATION (ANNUAL EVALUATION)

The Discharger shall conduct one Annual Evaluation for each reporting year (July 1 to June 30). If the Discharger conducts an Annual Evaluation fewer than eight (8) months, or more than sixteen (16) months, after it conducts the previous Annual Evaluation, it shall document the justification for doing so. The Discharger shall revise the SWPPP, as appropriate, and implement the revisions within 90 days of the Annual Evaluation. At a minimum, Annual Evaluations shall consist of:

- A. A review of all sampling, visual observation, and inspection records conducted during the previous reporting year;
- B. An inspection of all areas of industrial activity and associated potential pollutant sources for evidence of, or the potential for, pollutants entering the storm water conveyance system;
- C. An inspection of all drainage areas previously identified as having no exposure to industrial activities and materials in accordance with the definitions in Section XVII;
- D. An inspection of equipment needed to implement the BMPs;
- E. An inspection of any BMPs;
- F. A review and effectiveness assessment of all BMPs for each area of industrial activity and associated potential pollutant sources to determine if the BMPs are properly designed, implemented, and are effective in reducing and preventing pollutants in industrial storm water discharges and authorized NSWDS; and,
- G. An assessment of any other factors needed to comply with the requirements in Section XVI.B.

XVI. ANNUAL REPORT

- A. The Discharger shall certify and submit via SMARTS an Annual Report no later than July 15th following each reporting year using the standardized format and checklists in SMARTS.
- B. The Discharger shall include in the Annual Report:
 1. A Compliance Checklist that indicates whether a Discharger complies with, and has addressed all applicable requirements of this General Permit;

2. An explanation for any non-compliance of requirements within the reporting year, as indicated in the Compliance Checklist;
3. An identification, including page numbers and/or sections, of all revisions made to the SWPPP within the reporting year; and,
4. The date(s) of the Annual Evaluation.

XVII. CONDITIONAL EXCLUSION - NO EXPOSURE CERTIFICATION (NEC)

A. Discharges composed entirely of storm water that has not been exposed to industrial activity are not industrial storm water discharges. Dischargers are conditionally excluded from complying with the SWPPP and monitoring requirements of this General Permit if all of the following conditions are met:

1. There is no exposure of Industrial Materials and Activities to rain, snow, snowmelt, and/or runoff;
2. All unauthorized NSWDS have been eliminated and all authorized NSWDS meet the conditions of Section IV;
3. The Discharger has certified and submitted via SMARTS PRDs for NEC coverage pursuant to the instructions in Section II.B.2; and,
4. The Discharger has satisfied all other requirements of this Section.

B. NEC Specific Definitions

1. No Exposure - all Industrial Materials and Activities are protected by a Storm-Resistant Shelter to prevent all exposure to rain, snow, snowmelt, and/or runoff.
2. Industrial Materials and Activities - includes, but is not limited to, industrial material handling activities or equipment, machinery, raw materials, intermediate products, by-products, final products, and waste products.
3. Material Handling Activities - includes the storage, loading and unloading, transportation, or conveyance of any industrial raw material, intermediate product, final product, or waste product.
4. Sealed - banded or otherwise secured, and without operational taps or valves.
5. Storm-Resistant Shelters - includes completely roofed and walled buildings or structures. Also includes structures with only a top cover supported by permanent supports but with no side coverings, provided material within the structure is not subject to wind dispersion (sawdust, powders, etc.), or track-out, and there is no storm water discharged from within the structure that comes into contact with any materials.

C. NEC Qualifications

To qualify for an NEC, a Discharger shall:

1. Except as provided in subsection D below, provide a Storm-Resistant Shelter to protect Industrial Materials and Activities from exposure to rain, snow, snowmelt, run-on, and runoff;
2. Inspect and evaluate the facility annually to determine that storm water exposed to industrial materials or equipment has not and will not be discharged to waters of the United States. Evaluation records shall be maintained for five (5) years in accordance with Section XXI.J.4;
3. Register for NEC coverage by certifying that there are no discharges of storm water contaminated by exposure to Industrial Materials and Activities from areas of the facility subject to this General Permit, and certify that all unauthorized NSWDs have been eliminated and all authorized NSWDs meet the conditions of Section IV (Authorized NSWDs). NEC coverage and annual renewal requires payment of an annual fee in accordance with California Code of Regulations, title 23, section 2200 et seq.; and,
4. Submit PRDs for NEC coverage shall be prepared and submitted in accordance with the:
 - a. Certification requirements in Section XXI.K; and,
 - b. Submittal schedule in accordance with Section II.B.2.

D. NEC Industrial Materials and Activities - Storm-Resistant Shelter Not Required

To qualify for NEC coverage, a Storm-Resistant Shelter is not required for the following:

1. Drums, barrels, tanks, and similar containers that are tightly Sealed, provided those containers are not deteriorated, do not contain residual industrial materials on the outside surfaces, and do not leak;
2. Adequately maintained vehicles used in material handling;
3. Final products, other than products that would be mobilized in storm water discharge (e.g., rock salt);
4. Any Industrial Materials and Activities that are protected by a temporary shelter for a period of no more than ninety (90) days due to facility construction or remodeling; and,
5. Any Industrial Materials and Activities that are protected within a secondary containment structure that will not discharge storm water to waters of the United States.

E. NEC Limitations

1. NEC coverage is available on a facility-wide basis only, not for individual outfalls. If a facility has industrial storm water discharges from one or more drainage areas that require NOI coverage, Dischargers shall register for NOI coverage for the entire facility through SMARTS in accordance with Section II.B.2. Any drainage areas on that facility that would otherwise qualify for NEC coverage may be specially addressed in the facility SWPPP by including an NEC Checklist and a certification statement demonstrating that those drainage areas of the facility have been evaluated; and that none of the Industrial Materials or Activities listed in subsection C above are, or will be in the foreseeable future, exposed to precipitation.
2. If circumstances change and Industrial Materials and Activities become exposed to rain, snow, snowmelt, and/or runoff, the conditions for this exclusion shall no longer apply. In such cases, the Discharger may be subject to enforcement for discharging without a permit. A Discharger with NEC coverage that anticipates changes in circumstances should register for NOI coverage at least seven (7) days before anticipated exposure.
3. The Regional Water Board may deny NEC coverage and require NOI coverage upon determining that:
 - a. Storm water is exposed to Industrial Materials and Activities; and/or
 - b. The discharge has a reasonable potential to cause or contribute to an exceedance of an applicable water quality standards.

F. NEC Permit Registration Documents Required for Initial NEC Coverage

A Discharger shall submit via SMARTS the following PRDs for NEC coverage to document the applicability of the conditional exclusion:

1. The NEC form, which includes:
 - a. The legal name, postal address, telephone number, and e-mail address of the Discharger;
 - b. The facility business name and physical mailing address, the county name, and a description of the facility location if the facility does not have a physical mailing address; and,
 - c. Certification by the Discharger that all PRDs submitted are correct and true and the conditions of no exposure have been met.
2. An NEC Checklist prepared by the Discharger demonstrating that the facility has been evaluated; and that none of the following industrial materials or activities are, or will be in the foreseeable future, exposed to precipitation:

- a. Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed;
- b. Materials or residuals on the ground or in storm water inlets from spills/leaks;
- c. Materials or products from past industrial activity;
- d. Material handling equipment (except adequately maintained vehicles);
- e. Materials or products during loading/unloading or transporting activities;
- f. Materials or products stored outdoors (except final products intended for outside use, e.g., new cars, where exposure to storm water does not result in the discharge of pollutants);
- g. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
- h. Materials or products handled/stored on roads or railways owned or maintained by the Discharger;
- i. Waste material (except waste in covered, non-leaking containers, e.g., dumpsters);
- j. Application or disposal of processed wastewater (unless already covered by an NPDES permit); and,
- k. Particulate matter or visible deposits of residuals from roof stacks/vents evident in the storm water outflow.

3. Site Map (see Section X.E).

G. Requirements for Annual NEC Coverage Recertification

By October 1 of each reporting year beginning in 2015, any Discharger who has previously registered for NEC coverage shall either submit and certify an NEC demonstrating that the facility has been evaluated, and that none of the Industrial Materials or Activities listed above are, or will be in the foreseeable future, exposed to precipitation, or apply for NOI coverage.

H. NEC Certification Statement

All NEC certifications and re-certifications shall include the following certification statement:

I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of 'no exposure' and obtaining an exclusion from NPDES storm water permitting; and that there are no discharges of storm water contaminated by exposure to industrial activities

or materials from the industrial facility identified in this document (except as allowed in subsection C above). I understand that I am obligated to submit a no exposure certification form annually to the State Water Board and, if requested, to the operator of the local Municipal Separate Storm Sewer System (MS4) into which this facility discharges (where applicable). I understand that I must allow the Water Board staff, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under an NPDES permit prior to any point source discharge of storm water from the facility. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly involved in gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

XVIII. SPECIAL REQUIREMENTS - PLASTIC MATERIALS

- A.** Facilities covered under this General Permit that handle Plastic Materials are required to implement BMPs to eliminate discharges of plastic in storm water in addition to the other requirements of this General Permit that are applicable to all other Industrial Materials and Activities. Plastic Materials are virgin and recycled plastic resin pellets, powders, flakes, powdered additives, regrind, dust, and other similar types of preproduction plastics with the potential to discharge or migrate off-site. Any Dischargers' facility handling Plastic Materials will be referred to as Plastics Facilities in this General Permit. Any Plastics Facility covered under this General Permit that manufactures, transports, stores, or consumes these materials shall submit information to the State Water Board in their PRDs, including the type and form of plastics, and which BMPs are implemented at the facility to prevent illicit discharges. Pursuant to Water Code section 13367, Plastics Facilities are subject to mandatory, minimum BMPs.
1. At a minimum, Plastics Facilities shall implement and include in the SWPPP:
 - a. Containment systems at each on-site storm drain discharge location down gradient of areas containing plastic material. The containment system shall be designed to trap all particles retained by a 1mm mesh screen, with a treatment capacity of no less than the peak flow rate from a one-year, one-hour storm.
 - b. When a containment system is infeasible, or poses the potential to cause an illicit discharge, the facility may propose a technically feasible

alternative BMP or suite of BMPs. The alternative BMPs shall be designed to achieve the same or better performance standard as a 1mm mesh screen with a treatment capacity of the peak flow rate from a one-year, one-hour storm. Alternative BMPs shall be submitted to the Regional Water Board for approval.

- c. Plastics Facilities shall use durable sealed containers designed not to rupture under typical loading and unloading activities at all points of plastic transfer and storage.
 - d. Plastics Facilities shall use capture devices as a form of secondary containment during transfers, loading, or unloading Plastic Materials. Examples of capture devices for secondary containment include, but are not limited to catch pans, tarps, berms or any other device that collects errant material.
 - e. Plastics Facilities shall have a vacuum or vacuum-type system for quick cleanup of fugitive plastic material available for employees.
 - f. Pursuant to Water Code section 13367(e)(1), Plastics Facilities that handle Plastic Materials smaller than 1mm in size shall develop a containment system designed to trap the smallest plastic material handled at the facility with a treatment capacity of at least the peak flow rate from a one-year, one-hour storm, or develop a feasible alternative BMP or suite of BMPs that are designed to achieve a similar or better performance standard that shall be submitted to the Regional Water Board for approval.
2. Plastics Facilities are exempt from the Water Code requirement to install a containment system under section 13367 of the Water Code if they meet one of the following requirements that are determined to be equal to, or exceed the performance requirements of a containment system:
- a. The Discharger has certified and submitted via SMARTS a valid No Exposure Certification (NEC) in accordance with Section XVII; or
 - b. Plastics Facilities are exempt from installing a containment system, if the following suite of eight (8) BMPs is implemented. This combination of BMPs is considered to reduce or prevent the discharge of plastics at a performance level equivalent to or better than the 1mm mesh and flow standard in Water Code section 13367(e)(1).
 - i. Plastics Facilities shall annually train employees handling Plastic Materials. Training shall include environmental hazards of plastic discharges, employee responsibility for corrective actions to prevent errant Plastic Materials, and standard procedures for containing, cleaning, and disposing of errant Plastic Materials.

- ii. Plastics Facilities shall immediately fix any Plastic Materials containers that are punctured or leaking and shall clean up any errant material in a timely manner.
- iii. Plastics Facilities shall manage outdoor waste disposal of Plastic Materials in a manner that prevents the materials from leaking from waste disposal containers or during waste hauling.
- iv. Plastics Facilities that operate outdoor conveyance systems for Plastic Materials shall maintain the system in good operating condition. The system shall be sealed or filtered in such a way as to prevent the escape of materials when in operation. When not in operation, all connection points shall be sealed, capped, or filtered so as to not allow material to escape. Employees operating the conveyance system shall be trained how to operate in a manner that prevents the loss of materials such as secondary containment, immediate spill response, and checks to ensure the system is empty during connection changes.
- v. Plastics Facilities that maintain outdoor storage of Plastic Materials shall do so in a durable, permanent structure that prevents exposure to weather that could cause the material to migrate or discharge in storm water.
- vi. Plastics Facilities shall maintain a schedule for regular housekeeping and routine inspection for errant Plastic Materials. The Plastics Facility shall ensure that their employees follow the schedule.
- vii. PRDs shall include the housekeeping and routine inspection schedule, spill response and prevention procedures, and employee training materials regarding plastic material handling.
- viii. Plastics Facilities shall correct any deficiencies in the employment of the above BMPs that result in errant Plastic Materials that may discharge or migrate off-site in a timely manner. Any Plastic Materials that are discharged or that migrate off-site constitute an illicit discharge in violation of this General Permit.

XIX. REGIONAL WATER BOARD AUTHORITIES

- A.** The Regional Water Boards may review a Discharger’s PRDs for NOI or NEC coverage and administratively reject General Permit coverage if the PRDs are deemed incomplete. The Regional Water Boards may take actions that include rescinding General Permit coverage, requiring a Discharger to revise and re-submit their PRDs (certified and submitted by the Discharger) within a specified time period, requiring the Discharger to apply for different General Permit coverage or a different individual or general permit, or taking no action.
- B.** The Regional Water Boards have the authority to enforce the provisions and requirements of this General Permit. This includes, but is not limited to,

reviewing SWPPPs, Monitoring Implementation Plans, ERA Reports, and Annual Reports, conducting compliance inspections, and taking enforcement actions.

- C. As appropriate, the Regional Water Boards may issue NPDES storm water general or individual permits to a Discharger, categories of Dischargers, or Dischargers within a watershed or geographic area. Upon issuance of such NPDES permits, this General Permit shall no longer regulate the affected Discharger(s).
- D. The Regional Water Boards may require a Discharger to revise its SWPPP, ERA Reports, or monitoring programs to achieve compliance with this General Permit. In this case, the Discharger shall implement these revisions in accordance with a schedule provided by the Regional Water Board.
- E. The Regional Water Boards may approve requests from a Discharger to include co-located, but discontinuous, industrial activities within the same facility under a single NOI or NEC coverage.
- F. Consistent with 40 Code of Federal Regulations section 122.26(a)(9)(i)(D), the Regional Water Boards may require any discharge that is not regulated by this General Permit, that is determined to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States, to be covered under this General Permit as appropriate. Upon designation, the Discharger responsible for the discharge shall obtain coverage under this General Permit.
- G. The Regional Water Boards may review a Discharger's Inactive Mining Operation Certification and reject it at any time if the Regional Water Board determines that access to the facility for monitoring purposes is practicable or that the facility is not in compliance with the applicable requirements of this General Permit.
- H. All Regional Water Board actions that modify a Discharger's obligations under this General Permit must be in writing and should also be submitted in SMARTS.

XX. SPECIAL CONDITIONS

A. Reopener Clause

This General Permit may be reopened and amended to incorporate TMDL-related provisions. This General Permit may also be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, water quality control plans or water quality control policies, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations sections 122.62, 122.63, 122.64, and 124.5.

B. Water Quality Based Corrective Actions

1. Upon determination by the Discharger or written notification by the Regional Water Board that industrial storm water discharges and/or authorized NSWDS contain pollutants that are in violation of Receiving Water Limitations (Section VI), the Discharger shall:
 - a. Conduct a facility evaluation to identify pollutant source(s) within the facility that are associated with industrial activity and whether the BMPs described in the SWPPP have been properly implemented;
 - b. Assess the facility's SWPPP and its implementation to determine whether additional BMPs or SWPPP implementation measures are necessary to reduce or prevent pollutants in industrial storm water discharges to meet the Receiving Water Limitations (Section VI); and,
 - c. Certify and submit via SMARTS documentation based upon the above facility evaluation and assessment that:
 - i. Additional BMPs and/or SWPPP implementation measures have been identified and included in the SWPPP to meet the Receiving Water Limitations (Section VI); or
 - ii. No additional BMPs or SWPPP implementation measures are required to reduce or prevent pollutants in industrial storm water discharges to meet the Receiving Water Limitations (Section VI).
2. The Regional Water Board may reject the Dischargers water quality based corrective actions and/or request additional supporting documentation.

C. Requirements for Dischargers Claiming “No Discharge” through the Notice of Non-Applicability (NONA)

1. For the purpose of the NONA, the Entity (Entities) is referring to the person(s) defined in section 13399.30 of the Water Code.
2. Entities who are claiming “No Discharge” through the NONA shall meet the following eligibility requirements:
 - a. The facility is engineered and constructed to have contained the maximum historic precipitation event (or series of events) using the precipitation data collected from the National Oceanic and Atmospheric Agency's website (or other nearby precipitation data available from other government agencies) so that there will be no discharge of industrial storm water to waters of the United States; or,
 - b. The facility is located in basins or other physical locations that are not hydrologically connected to waters of the United States.
3. When claiming the “No Discharge” option, Entities shall submit and certify via SMARTS both the NONA and a No Discharge Technical Report. The No

Discharge Technical Report shall demonstrate the facility meets the eligibility requirements described above.

4. The No Discharge Technical Report shall be signed (wet signature and license number) by a California licensed professional engineer.

XXI. STANDARD CONDITIONS

A. Duty to Comply

Dischargers shall comply with all standard conditions in this General Permit. Permit noncompliance constitutes a violation of the Clean Water Act and the Water Code and is grounds for enforcement action and/or removal from General Permit coverage.

Dischargers shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions.

B. Duty to Reapply

Dischargers that wish to continue an activity regulated under this General Permit after the expiration date of this General Permit shall apply for and obtain authorization from the Water Boards as required by the new general permit once it is issued.

C. General Permit Actions

1. This General Permit may be modified, revoked and reissued, or terminated for cause. Submittal of a request by the Discharger for General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.
2. If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under section 307(a) of the Clean Water Act for a toxic pollutant which is present in the discharge, and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.

D. Need to Halt or Reduce Activity Not a Defense

In an enforcement action, it shall not be a defense for a Discharger that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

E. Duty to Mitigate

Dischargers shall take all responsible steps to reduce or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

F. Proper Operation and Maintenance

Dischargers shall at all times properly operate and maintain any facilities and systems of treatment and control (and related equipment and apparatuses) which are installed or used by the Discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a Discharger when necessary to achieve compliance with the conditions of this General Permit.

G. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges. It also does not authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of federal, state, or local laws and regulations.

H. Duty to Provide Information

Upon request by the relevant agency, Dischargers shall provide information to determine compliance with this General Permit to the Water Boards, U.S. EPA, or local Municipal Separate Storm Sewer System (MS4) within a reasonable time. Dischargers shall also furnish, upon request by the relevant agency, copies of records that are required to be kept by this General Permit.

I. Inspection and Entry

Dischargers shall allow the Water Boards, U.S. EPA, and local MS4 (including any authorized contractor acting as their representative), to:

1. Enter upon the premises at reasonable times where a regulated industrial activity is being conducted or where records are kept under the conditions of this General Permit;
2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
3. Inspect the facility at reasonable times; and,
4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

J. Monitoring and Records

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
2. If Dischargers monitor any pollutant more frequently than required, the results of such monitoring shall be included in the calculation and reporting of the data submitted.
3. Records of monitoring information shall include:
 - a. The date, exact location, and time of sampling or measurement;
 - b. The date(s) analyses were performed;
 - c. The individual(s) that performed the analyses;
 - d. The analytical techniques or methods used; and,
 - e. The results of such analyses.
4. Dischargers shall retain, for a period of at least five (5) years, either a paper or electronic copy of all storm water monitoring information, records, data, and reports required by this General Permit. Copies shall be available for review by the Water Board's staff at the facility during scheduled facility operating hours.
5. Upon written request by U.S. EPA or the local MS4, Dischargers shall provide paper or electronic copies of Annual Reports or other requested records to the Water Boards, U.S. EPA, or local MS4 within ten (10) days from receipt of the request.

K. Electronic Signature and Certification Requirements

1. All Permit Registration Documents (PRDs) for NOI and NEC coverage shall be certified and submitted via SMARTS by the Discharger's Legally Responsible Person (LRP). All other documents may be certified and submitted via SMARTS by the LRP or by their designated Duly Authorized Representative.
2. When a new LRP or Duly Authorized Representative is designated, the Discharger shall ensure that the appropriate revisions are made via SMARTS. In unexpected or emergency situations, it may be necessary for the Discharger to directly contact the State Water Board's Storm Water Section to register for SMARTS account access in order to designate a new LRP.
3. Documents certified and submitted via SMARTS by an unauthorized or ineligible LRP or Duly Authorized Representative are invalid.

4. LRP eligibility is as follows:
 - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - i. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function; or
 - ii. The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively;
 - c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. This includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA).

5. Duly Authorized Representative eligibility is as follows:
 - a. The Discharger must authorize via SMARTS any person designated as a Duly Authorized Representative;
 - b. The authorization shall specify that a person designated as a Duly Authorized Representative has responsibility for the overall operation of the regulated facility or activity, such as a person that is a manager, operator, superintendent, or another position of equivalent responsibility, or is an individual who has overall responsibility for environmental matters for the company; and,
 - c. The authorization must be current (it has been updated to reflect a different individual or position) prior to any report submittals, certifications, or records certified by the Duly Authorized Representative.

L. Certification

Any person signing, certifying, and submitting documents under Section XXI.K above shall make the following certification:

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

M. Anticipated Noncompliance

Dischargers shall give advance notice to the Regional Water Board and local MS4 of any planned changes in the industrial activity that may result in noncompliance with this General Permit.

N. Penalties for Falsification of Reports

Clean Water Act section 309(c)(4) provides that any person that knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

O. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the initiation of any legal action or relieve the Discharger from any responsibilities, liabilities, or penalties to which the Discharger is or may be subject to under section 311 of the Clean Water Act.

P. Severability

The provisions of this General Permit are severable; if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

Q. Penalties for Violations of Permit Conditions

1. Clean Water Act section 309 provides significant penalties for any person that violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act or any permit condition or limitation implementing any such section in a permit issued under section 402. Any

person that violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500²² per calendar day of such violation, as well as any other appropriate sanction provided by section 309 of the Clean Water Act.

2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which may be greater than penalties under the Clean Water Act.

R. Transfers

Coverage under this General Permit is non-transferrable. When operation of the facility has been transferred to another entity, or a facility is relocated, new PRDs for NOI and NEC coverage must be certified and submitted via SMARTS prior to the transfer, or at least seven (7) days prior to the first day of operations for a relocated facility.

S. Continuation of Expired General Permit

If this General Permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 Code of Federal Regulations 122.6 and remain in full force and effect.

²² May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FACT SHEET FOR
STORM WATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITIES
NPDES NO. CAS000001**

*The factsheet to the IGP was updated in January 2015 to correct typographical errors. The deadline listed in Section I.D.13 (page 8) and Section II.G.1 (page 27) of the factsheet for dischargers with outfalls to ocean waters to develop and implement a monitoring program in compliance with the California Ocean Plan model monitoring provisions was corrected to July 1, 2015, which is the deadline listed in finding 44 in the general order.

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I. BACKGROUND

A. Purpose

The purpose of this Fact Sheet is to explain the legal requirements and technical rationale that serve as the basis for the requirements of this Order 2014-0057-DWQ (General Permit), adopted by the State Water Resources Control Board (State Water Board) on April 1, 2014. This General Permit regulates operators of facilities subject to storm water permitting (Dischargers), that discharge storm water associated with industrial activity (industrial storm water discharges). This General Permit replaces Water Quality Order 97-03-DWQ. This Fact Sheet does not contain any independently-enforceable requirements; the General Permit contains all of the actual requirements applicable to Dischargers. In case of any conflict between the Fact Sheet and the General Permit, the terms of the General Permit govern.

B. History

The Federal Clean Water Act (CWA)¹ prohibits discharges from point sources to waters of the United States, unless the discharges are in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. (CWA § 301(a).) In 1987, the CWA was amended to establish a framework for regulating municipal storm water discharges and discharges of storm water associated with industrial activity (industrial storm water discharges) under the NPDES program. (CWA § 402(p).) In 1990, the United States Environmental Protection Agency (U.S. EPA) promulgated regulations, commonly known as Phase I, establishing application requirements for storm water permits for specified categories of industries. (40 C.F.R. § 122.26.) In 1992, U.S. EPA revised the monitoring requirements for industrial storm water discharges. (40 C.F.R. § 122.44(i)(2), (4), (5).) In 1999, U.S. EPA adopted additional storm water regulations, known as Phase II. (64 Fed. Reg. 68722.) The Phase II regulations provide for, among other things, a conditional exclusion from NPDES permitting requirements for industrial activities that have no exposure to storm water.

Industrial storm water discharges are regulated pursuant to CWA section 402(p)(3)(A). This provision requires NPDES permits for industrial storm water discharges to implement CWA section 301, which includes requirements for Dischargers to comply with technology-based effluent limitations, and any more stringent water quality-based limitations necessary to meet water quality standards. Technology-based effluent limitations applicable to industrial activities are based on best conventional pollutant control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. (CWA § 301(b)(1)(A) and (2)(A).) To ensure compliance with water quality standards, NPDES permits may also require a Discharger to implement best management practices (BMPs). 40 Code of Federal Regulations section 122.44(k)(4) requires the use of BMPs to control or abate the discharge of pollutants when numeric effluent limitations (NELs) are infeasible. The State Water Board has concluded that it is infeasible to establish

¹ Federal Water Pollution Control Act of 1970 (also referred to as the Clean Water Act or CWA), 33 U.S.C. § 1201 et seq. All further statutory references herein are to the CWA unless otherwise indicated.

NELs for storm water discharges associated with industrial activity due to insufficient information at the time of adoption of this General Permit.

On April 17, 1997, the State Water Board issued NPDES General Permit for Industrial Storm Water Discharges, Excluding Construction Activities, Water Quality Order 97-03-DWQ (previous permit). This General Permit, Order 2014-0057-DWQ rescinds the previous permit and serves as the statewide general permit for industrial storm water discharges. The State Water Board concludes that significant revisions to the previous permit requirements are necessary for implementation, consistency and objective enforcement. As discussed in this Fact Sheet, this General Permit requires Dischargers to:

- Eliminate unauthorized non-storm water discharges (NSWDs);
- Develop and implement storm water pollution prevention plans (SWPPPs) that include best management practices (BMPs);
- Implement minimum BMPs, and advanced BMPs as necessary, to achieve compliance with the effluent and receiving water limitations of this General Permit;
- Conduct monitoring, including visual observations and analytical storm water monitoring for indicator parameters;
- Compare monitoring results for monitored parameters to applicable numeric action levels (NALs) derived from the U.S. EPA 2008 Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity (2008 MSGP) and other industrial storm water discharge monitoring data collected in California;
- Perform the appropriate Exceedance Response Actions (ERAs) when there are exceedances of the NALs; and,
- Certify and submit all permit-related compliance documents via the Storm Water Multiple Application and Report Tracking System (SMARTS). Dischargers shall certify and submit these documents which include, but are not limited to, Permit Registration Documents (PRDs) including Notices of Intent (NOIs), No Exposure Certifications (NECs), and Storm Water Pollution Prevention Plans (SWPPPs), as well as Annual Reports, Notices of Termination (NOTs), Level 1 ERA Reports, and Level 2 ERA Technical Reports.

C. Blue Ribbon Panel of Experts (Panel)

In 2005 and 2006, the State Water Board convened a Blue Ribbon Panel of Experts (Panel) to address the feasibility of NELs in California's storm water permits. Specifically, the Panel was charged with answering the following questions:

Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits?

How would such limitations or criteria be established, and what information and data would be required?²

The Panel was directed to answer these questions for industrial storm water discharge general permits, construction storm water discharge general permits, and area-wide municipal storm water discharge permits. The Panel was also directed to address both technology-based and water quality based limitations and criteria.

In evaluating the establishment of numeric limitations and criteria, the Panel was directed to consider all of the following:

- The ability of the State Water Board to establish appropriate objective limitations or criteria;
- How compliance is to be determined;
- The ability of Dischargers and inspectors to monitor for compliance; and
- The technical and financial ability of Dischargers to comply with the limitations or criteria.

Following an opportunity for public comment, the Panel identified several water quality concerns, public process and program effectiveness issues. A summary of the Panel's recommendations regarding industrial storm water discharges follows:³

- Current data are inadequate; accordingly, the State Water Board should improve monitoring requirements to collect useful data for establishing NALs and NELs.
- Required parameters for further monitoring should be consistent with the type of industrial activity (i.e., monitor for heavy metals when there is a reasonable expectation that the industrial activity will contribute to increased heavy metals concentrations in storm water).
- Insofar as possible, the use of California data (or national data applicable to California) is preferred when setting NELs and NALs.
- Industrial facilities that do not discharge to Municipal Separate Storm Sewer Systems (MS4s) should implement BMPs for their non-industrial exposure (e.g., parking lots, roof runoff) similar to BMPs implemented by commercial facilities in MS4 jurisdictions.

² State Water Board Storm Water Panel of Experts, The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 19, 2006). http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/numeric/swpanel_final_report.pdf. [as of February 4, 2014].

³ See footnote 2.

- In all cases, Dischargers should implement a suite of minimum BMPs, including, but not limited to, good housekeeping practices, employee training, and preventing exposure of materials to rain.
- Standard Industrial Classification (SIC) code categories are not a satisfactory way of identifying industrial activities at any given site. The State Water Board should develop an improved method of characterizing industrial activities that will improve water quality in storm water.
- Recognizing that implementing the Panel’s suggested changes is a large task, the State Water Board should set priorities for implementation of the Panel’s suggested approach in order to achieve the greatest reduction of pollutants statewide.
- Recognizing that an increasing number of industries have moved industrial activities indoors to prevent storm water pollution, such facilities should be granted regulatory relief from NALs and/or NELs , but should still be required to comply with any applicable MS4 permit requirements.
- Recognizing the need for improved monitoring and reduction of pollutants in industrial storm water discharges, the State Water Board should consider the total economic impact of its requirements to not economically penalize California industries when compared to industries outside of California.

With regard to the industrial activities component of its charge, the Panel limited its focus to the question of whether sampling data can be used to derive technology-based NELs. The Panel did not address other factors or approaches that may relate to the task of determining technology- and water quality-based NELs consistent with the regulations and law. Examples of these other factors are discussed in more detail in this Fact Sheet. Additionally, in its final report the Panel did not clearly differentiate between the role of numeric and non-numeric effluent limitations, nor did it consider U.S. EPA procedures used to promulgate effluent limitation guidelines (ELGs) in 40 Code of Federal Regulations, Chapter I, Subchapter N (Subchapter N).

D. Summary of Significant Changes in this General Permit

The previous permit issued by the State Water Board on April 17, 1997, had been administratively extended since 2002 until the adoption of this General Permit. Significant revisions to the previous permit were necessary to update permit requirements consistent with recent regulatory changes pertaining to industrial storm water under the CWA. This General Permit differs from the previous permit in the following areas:

1. Minimum Best Management Practices (BMPs)

This General Permit requires Dischargers to implement a set of minimum BMPs. Implementation of the minimum BMPs, in combination with any advanced BMPs (BMPs, collectively,) necessary to reduce or prevent pollutants in industrial storm water discharges, serve as the basis for compliance with this General Permit’s

technology-based effluent limitations and water quality based receiving water limitations. Although there is great variation in industrial activities and pollutant sources between industrial sectors and, in some cases between operations within the same industrial sector, the minimum BMPs specified in this General Permit represent common practices that can be implemented by most facilities.

The previous permit did not require a minimum set of BMPs but rather allowed Dischargers to consider which non-structural BMPs should be implemented and which structural BMPs should be considered for implementation when non-structural BMPs are ineffective.

This General Permit requires Dischargers to implement minimum BMPs (which are mostly non-structural BMPs), and advanced BMPs (which are mostly structural BMPs) when implementation of the minimum BMPs do not meet the requirements of the General Permit. Advanced BMPs consists of treatment control BMPs, exposure reduction BMPs, and storm water containment and discharge reduction BMPs. BMPs that exceed the performance expectation of minimum BMPs are considered advanced BMPs. Dischargers are encouraged to utilize advanced BMPs that infiltrate or reuse storm water where feasible.

The minimum and advanced BMPs required in this General Permit are consistent with U.S. EPA's 2008 Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (2008 MSGP), guidance developed by the California Stormwater Quality Association, and recommendations by Regional Water Quality Control Board (Regional Water Board) inspectors. Dischargers are required to evaluate BMPs being implemented and determine an appropriate interval for the implementation and inspection of these BMPs.

2. Conditional Exclusion - No Exposure Certification (NEC)

This General Permit applies U.S. EPA Phase II regulations regarding a conditional exclusion for facilities that have no exposure of industrial activities and materials to storm water. (40 C.F.R. § 122.26(g).) (The previous permit required light industries to obtain coverage only if their activities were exposed to storm water.) This General Permit implements current U.S. EPA rules allowing any type of industry to claim a conditional exclusion. The NEC requires enrollment for coverage prior to conditionally excluding a Discharger from a majority of this General Permit's requirements.

3. Electronic Reporting Requirements

This General Permit requires Dischargers to submit and certify all reports electronically via SMARTS. The previous permit used a paper reporting process with electronic reporting as an option.

4. Training Expectations and Roles

This General Permit requires that Dischargers arrange to have appropriately trained personnel implementing this General Permit's requirements at each facility. In

addition, if a Discharger's facility enters Level 1 status, the Level 1 ERA Report must be prepared by a Qualified Industrial Storm Water Practitioner (QISP). All Action Plans and Technical Reports required in Level 2 status must also be prepared by a QISP.

Dischargers may appoint a staff person to complete the QISP training or may contract with an outside QISP. QISP training is tailored to persons with a high degree of technical knowledge and environmental experience. Although QISPs do not need to be California licensed professional engineers, it may be necessary to involve a California licensed professional engineer to perform certain aspects of the Technical Reports.

5. Numeric Action Levels (NALs) and NAL Exceedances

This General Permit contains two types of NAL exceedances. An annual NAL exceedance occurs when the average of all sampling results within a reporting year for a single parameter (except pH) exceeds the applicable annual NAL. The annual NALs are derived from, and function similarly to, the benchmark values provided in the 2008 MSGP. Instantaneous maximum NALs target hot spots or episodic discharges of pollutants. An instantaneous maximum NAL exceedance occurs when two or more analytical results from samples taken for any parameter within a reporting year exceed the applicable instantaneous maximum NAL value. Instantaneous maximum NALs for Total Suspended Solids (TSS) and Oil and Grease (O&G) are based on previously gathered California industrial storm water discharge monitoring data. The instantaneous maximum NAL for pH is derived from the benchmark value provided in the 2008 MSGP.

6. Exceedance Response Actions (ERA)

This General Permit requires Dischargers to develop and implement ERAs, when an annual NAL or instantaneous maximum NAL exceedance occurs during a reporting year. The first time an annual NAL or instantaneous maximum NAL exceedance occurs for any one parameter, a Discharger's status is changed from Baseline to Level 1 status, and the Discharger is required to evaluate and revise, as necessary, its BMPs (with the assistance of a QISP) and submit a report prepared by a QISP. The second time an annual NAL or instantaneous maximum NAL exceedance occurs for the same parameter in a subsequent reporting year, the Discharger's status is changed from Level 1 to Level 2 status, and Dischargers are required to submit a Level 2 ERA Action Plan and a Level 2 ERA Technical Report. Unless the demonstration is not accepted by the State Water Board or a Regional Water Board, the Discharger is not required to perform additional ERA requirements for the parameter(s) involved if the Discharger demonstrates that:

- a. Additional BMPs required to eliminate NAL exceedances are not technologically available or economically practicable and achievable; or,
- b. NAL exceedances are solely caused by non-industrial pollutant sources; or,

- c. NAL exceedances are solely attributable to pollutants from natural background sources.

Information supporting the above demonstrations must be included in QISP-prepared Level 2 ERA Technical Reports.

7. CWA section 303(d) Impairment

This General Permit requires a Discharger to monitor additional parameters if the discharge(s) from its facility contributes pollutants to receiving waters that are listed as impaired for those pollutants (CWA section 303(d) listings). This General Permit lists the receiving waters that are 303(d) listed as impaired for pollutants that are likely to be associated with industrial storm water in Appendix 3. For example, if a Discharger discharges to a water body that is listed as impaired for copper, and the discharge(s) from its facility has the potential sources of copper, the Discharger must add copper to the list of parameters to monitor in its storm water discharge.

8. Design Storm Standards for Treatment Control BMPs

This General Permit includes design storm standards for Dischargers implementing treatment control BMPs. The design storm standards include both volume- and flow-based criteria. Dischargers are not required to retrofit existing treatment control BMPs unless required to meet the technology-based effluent limitations and receiving water limitations in this General Permit.

9. Qualifying Storm Event (QSE)

This General Permit defines a QSE as a precipitation event that:

- a. Produces a discharge for at least one drainage area; and,
- b. Is preceded by 48 hours with no discharge from any drainage area.

The definition above differs from the definition in the previous permit, resulting in an increase number of QSEs eligible for sample collection. Therefore, most Dischargers will be able to collect the required number of samples, regardless of their facility location.

10. Sampling Protocols

This General Permit requires Dischargers to collect samples during scheduled facility operating hours from each drainage location within four hours of: (1) the start of the discharge from a QSE occurring during scheduled facility operating hours, or (2) the start of scheduled facility operating hours if the QSE occurred in the previous twelve (12) hours. The benefits of this sampling protocol: (a) allows a more reasonable amount of time to collect samples, (b) increases the likelihood for samples collected at discharge locations to be representative of the drainage area discharge characteristics, (c) increases the number of QSEs eligible for sample collection, and, (d) reduces the likelihood of Dischargers collecting samples with short-term concentration spikes.

The previous permit required that Dischargers collect grab samples during the first hour of discharge that commenced during scheduled facility operating hours. These sample collection requirements were widely considered to be too rigid and out of step with other states' sample collection requirements. Since many storm events begin in the evening or early morning hours, numerous opportunities to collect samples were lost because Dischargers could not obtain samples during the first hour of discharge. Dischargers with facilities that have multiple discharge locations had difficulties collecting samples within such a short timeframe therefore affecting data quality.

11. Sampling Frequency

This General Permit increases the sampling frequency by requiring the Discharger to collect and analyze storm water samples from each discharge location for two (2) QSEs within the first half of each reporting year (July 1 to December 31), and two (2) QSEs within the second half of each reporting year (January 1 to June 30). The increased sampling, compared to the previous permit's two samples during the wet season, is consistent with the 2008 MSGP and other states' permit requirements and will improve compliance determination with this General Permit. The State Water Board expects that the elimination of the wet season sampling requirements will increase the number of possible QSEs eligible for monitoring.

12. Compliance Groups

To allow industrial facilities to efficiently share knowledge, skills and resources towards achieving General Permit compliance, this General Permit allows the formation of Compliance Groups and Compliance Group Leaders. Dischargers participating in a Compliance Group (Compliance Group Participants) are collectively required to sample twice a year. Compliance Group Leaders are required to be approved through the State Water Board-approved training program process, inspect each facility once within each reporting year, and prepare Level 1 and Level 2 ERA reports as necessary. The Compliance Group option is described in more detail in General Permit section XIV and in this Fact Sheet in the Section titled "Compliance Groups."

13. Discharges to Ocean Waters

This General Permit requires Dischargers with ocean-discharging outfalls subject to model monitoring provisions of the California Ocean Plan to develop and implement a monitoring plan in compliance with those provisions and any additional monitoring requirements established pursuant to Water Code section 13383. Dischargers who have not developed and implemented a monitoring program in compliance with the California Ocean Plan model monitoring provisions by July 1, 2015 or seven (7) days prior to commencing operations, whichever is later, are ineligible to obtain coverage under this General Permit.

II. TECHNICAL RATIONALE FOR REQUIREMENTS IN THIS GENERAL PERMIT

A. Receiving General Permit Coverage

1. This General Permit provides regulatory coverage for new and existing industrial storm water discharges and authorized NSWs from:
 - a. Facilities required by federal regulations to obtain an NPDES permit;
 - b. Facilities designated by the Regional Water Boards to obtain an NPDES permit; and,
 - c. Facilities directed by the Regional Water Boards to obtain coverage specifically under this General Permit. The Regional Water Board typically directs a Discharger to change General Permit coverage under two circumstances:
 - (1) switch from an individual NPDES permit to this General Permit, or
 - (2) switch from the NPDES General Permit for Storm Water Discharges Associated with Construction And Land Disturbance Activities, (Order 2009-0009-DWQ, NPDES No CAS000002) to this General Permit for long-term construction related activities that are similar to industrial activities (e.g. concrete batch plants).

40 Code of Federal Regulations section 122.26(b)(14) defines "storm water discharge associated with industrial activity" and describes the types of facilities subject to permitting (primarily by Standard Industrial Classification (SIC) code). This General Permit provides regulatory coverage for all facilities with industrial activities described in Attachment A where the covered industrial activity is the Discharger's primary industrial activity. In some instances, a Discharger may have more than one primary industrial activity occurring at a facility.

The 1987 SIC manual uses the term "establishment" to determine the primary economic activity of a facility. The manual instructs that where distinct and separate economic activities are performed at a single location, each activity should be treated as a separate establishment (and, therefore, separate primary activity). For example, the United States Navy (primary SIC code 9711) may conduct industrial activities subject to permitting under this General Permit, such as landfill operations (SIC code 4953), ship and boat building and repair (SIC code 3731, and flying field operations (SIC code 4581).

The SIC manual also discusses "auxiliary" functions of establishments. Auxiliary functions provide management or support services to the establishment. Examples of auxiliary functions are warehouses and storage facilities for the establishment's own materials, maintenance and repair shops of the establishment's own machinery, automotive repair shops or storage garages of the establishment's own vehicles, administrative offices, research, development, field engineering support, and testing conducted for the establishment. When auxiliary functions are performed at physically separate facilities from the establishment they serve, they generally are not subject to General Permit coverage. If

auxiliary functions are performed at the same physical location as the establishment, then they are subject to General Permit coverage if they are associated with industrial activities.

This clarification does not change the scope of which facilities are subject to permitting relative to the 1997 IGP. The 1997 IGP Fact Sheet had used the term “auxiliary” to describe a facility’s separate primary activities, which has caused confusion.

In 1997, the North American Industrial Classification System (NAICS) was published, replacing the SIC code system. The U.S. EPA has indicated that it intends to incorporate the NAICS codes into the federal storm water regulations but has not done so yet. The State Water Board recognizes that many Dischargers in newer industries were not included in the 1987 SIC code manual and may have difficulty determining their SIC code information. To address this transition, SMARTS has been modified to accept both SIC codes and NAICS codes, and NAICS codes are automatically translated into SIC codes. There may be instances of conflict between SIC and NAICS codes. The use of NAICS codes shall not expand or reduce the types of industries subject to this General Permit as compared to the SIC codes listed in the General Permit. State Water Board staff will work closely with the applicant to resolve these conflicts in SMARTS as they are identified. Dischargers should be aware that the use of an NAICS code which results in failure to submit any of the required PRDs under this General Permit remains a violation of the terms of this General Permit.

The facilities included in category one of Attachment A (facilities subject to Subchapter N) are subject to storm water ELGs that are incorporated into the requirements of this General Permit. Dischargers whose facilities are included in this category must examine the appropriate federal ELGs to determine the applicability of those guidelines. This General Permit contains additional requirements (Section XI.D) that apply only to facilities with storm water ELGs.

2. Types of Discharges Not Covered by this General Permit
 - a. Discharges from construction and land disturbance activities that are subject to the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit).
 - b. Discharges covered by an individual or general storm water NPDES permit. Some industrial storm water discharges may be regulated by other individual or general NPDES permits issued by the State Water Board or the Regional Water Boards (Water Boards, collectively,). This General Permit shall not regulate these discharges. When the individual or general NPDES permits for such discharges expire, the Water Boards may authorize coverage under this General Permit or another general NPDES permit, or may issue a new individual NPDES permit consistent with the federal and state storm water regulations. Interested parties may request that the State Water Board or appropriate Regional Water Board issue individual or general NPDES permits for specific discharges that, in their view are not properly regulated through this General Permit. General permits may be issued for a particular industrial group or watershed area which

would supersede this General Permit. To date, two Regional Water Board have issued such permits:

- i. The Lahontan Regional Water Board has adopted an NPDES permit and general Waste Discharge Requirements to regulate discharges from marinas and maintenance dredging (Regional Water Board Order R6T-2005-0015 - NPDES Permit No. CAG616003) in the Lake Tahoe Hydrologic Unit.
 - ii. The Santa Ana Regional Water Board adopted the Sector Specific General Permit for Stormwater Runoff Associated with Industrial Activities from Scrap Metal Recycling Facilities within the Santa Ana Region, Order R8-2012-0012, NPDES Permit No. CAG 618001 (Scrap Metal Recycling Permit). The Scrap Metal Recycling Permit is applicable to facilities within the Santa Ana Region that are listed under Standard Industrial Classification (SIC) Code 5093 and engaged in the following types of activities: (1) automotive wrecking for scrap-wholesale (this category does not include facilities engaged in automobile dismantling for the primary purpose of selling second hand parts); (2) iron and steel scrap - wholesale; (3) junk and scrap metal - wholesale; (4) metal waste and scrap - wholesale; and (5) non-ferrous metals scrap - wholesale. Other types of facilities listed under SIC Code 5093 and engaged in waste recycling are not required to get coverage under the Scrap Metal Recycling Permit. A list of covered facilities as of February 8, 2011 was included in Attachment A of the Scrap Metal Recycling Permit.
- c. Discharges that the Regional Water Boards determine to be ineligible for coverage under this General Permit. In such cases, a Regional Water Board will require the discharges be covered by another individual or general NPDES permit. The applicability of this General Permit to such discharges is terminated when the discharge is subject to another individual or general NPDES permit.
- d. Discharges that do not enter waters of the United States. These include:
- i. Discharges to municipal separate sanitary sewer systems;
 - ii. Discharges to evaporation ponds, discharges to percolation ponds, and/or any other methods used to retain and prevent industrial storm water discharges from entering waters of the United States;
 - iii. Discharges to combined sewer systems. In California, the only major combined sewer systems are located in San Francisco and downtown Sacramento. Dischargers who believe they discharge into a combined sewer system should contact the local Regional Water Board to verify discharge location; and,
 - iv. Dischargers Claiming the “No Discharge” Option in the Notice of Non-Applicability (NONA) (Fact Sheet Section II.S).
- e. Discharges from mining operations or oil and gas facilities composed entirely of flows that are from conveyances or systems of conveyances used for collecting and conveying precipitation runoff and do not come into contact with any overburden, raw materials, intermediate products, finished products, by-products, or waste products located at the facility. (33 U.S.C. § 1342(l)(2).)
- f. Discharges from facilities on Tribal Lands regulated by U.S. EPA.

3. Obtaining General Permit Coverage (Section II of this General Permit)

The State Water Board has developed the SMARTS online database system to handle registration and reporting under this General Permit. More information regarding SMARTS and access to the database is available online at <https://smarts.waterboards.ca.gov>. The State Water Board has determined that all documents related to general storm water enrollment and compliance must be certified and submitted via SMARTS by Dischargers.

This General Permit requires all Dischargers to electronically certify and submit PRDs via SMARTS to obtain: (1) regulatory coverage, or (2) to certify that there are no industrial activities exposed to storm water at the facility and obtain regulatory coverage under the NEC provision of this General Permit. Facilities that were eligible to self-certify no exposure under the previous permit (see category 10 in Attachment 1 of the previous permit) are required to certify and submit via SMARTS PRDs for NOI coverage under this General Permit by July 1, 2015 or for NEC coverage by October 1, 2015. The Water Board is estimating that 10,000 – 30,000 Dischargers may be registering for NOI or NEC coverage under this General Permit. Separate registration deadlines, one for NOI coverage and one for NEC coverage, provides Dischargers better assistance from Storm Water Helpdesk and staff.

Dischargers shall electronically certify and submit the PRDs via SMARTS for each individual facility. This requirement is intended to establish a clear accounting of the name, address, and contact information for each Discharger, as well as a description of each Discharger's facility.

The Water Boards recognize that certain information pertaining to an industrial facility may be confidential. Many Stakeholders were asking for clarification on the process the Water Boards would use to manage confidential information or the process Dischargers could use to redact such information. Dischargers may redact trade secrets information from required submittals (Section II.B.3.d). Dischargers are required to include a general description of the redacted information and the basis for the redaction. Dischargers are still required to submit complete and un-redacted versions of the information to the Water Boards within 30 days, however these versions should be clearly labeled "CONFIDENTIAL" so that the confidentiality of these documents is clear to Regional Water Board staff, even when there is a change in staff. This General Permit requires that all information provided to the Water Boards by the Discharger comply with the Homeland Security Act and other federal law that addresses security in the United States.

All Dischargers who certify and submit PRDs via SMARTS for NOI coverage on or after July 1, 2015 or for NEC coverage on or after October 1, 2015, shall immediately comply with the provisions in this General Permit.

4. General Permit Coverage for Landfills

This General Permit covers storm water discharges from landfills, land application sites, and open dumps that receive or have received industrial waste from any facility covered by this General Permit. Industrial storm water discharges from these

facilities must be covered by this General Permit unless (1) they are already covered by another NPDES permit, or (2) the Regional Water Board has determined that an NPDES permit is not required because the site has been stabilized or required closure activities have been completed.

In most cases, it is appropriate for new landfill construction or final closure to be covered by the Construction General Permit, rather than this General Permit. Questions have arisen as to what constitutes new landfill construction at an existing landfill versus the normal planned expansion of a landfill. Similarly, questions have arisen about the type of closure activities that may be subject to the Construction General Permit versus the normal closure of “cells” that occurs during continued landfill operations and are not subject to the Construction General Permit. Other questions such as whether temporary or permanent newly graded/paved roads disturbing greater than one acre at a landfill are subject to the Construction General Permit. Landfill Dischargers have asked for clarity regarding these questions. The previous permit required Dischargers to contact the Regional Water Boards to determine permit appropriateness. Site specific circumstances continue to require Dischargers to contact Regional Water Boards for final determinations.

Based upon the State Water Board’s storm water program history, there are only a handful of instances where an operating landfill has been simultaneously subject to both the construction and industrial permitting requirements. Typically a landfill is subject to the construction permitting requirements during the time the landfill is initially constructed and prior to operation. A landfill is subject to the industrial permitting requirements during landfill operations, and subject to the construction permitting requirements during final landfill closure activities.

Once a landfill begins operations, continued expansion or closure of incremental landfill cells is authorized under the industrial permitting requirements since these are normal aspects of landfill operations. These expansion/closure activities occur within a limited timeframe (often taking less than 90 days from beginning to end) and are not separately subject to additional local approval (e.g., a new building permit). Any construction or demolition of temporary non-impervious roads directly related to landfill operations are subject to the industrial permitting requirements.

Construction or closure of a separate section of the landfill that is either subject to additional permitting by the local authorities and/or lasts more than 90 days requires coverage under the Construction General Permit. Construction of permanent facility structures such as buildings and impervious parking lots or roads that disturb greater than one acre are also subject to the Construction General Permit. (Permanent facility structures are defined as any structural improvements designed to remain until the landfill is closed.)

Site specific circumstances such as proximity to nearby waterways, extent of activities, pollutants of concern, and other considerations can impact any decision as to whether a particular activity is to be regulated under this General Permit or the Construction General Permit. Regional Water Boards will continue to exercise their discretion as necessary to protect the beneficial uses of the receiving water(s).

5. General Permit Coverage for Small Municipal Separate Storm Sewer Systems (MS4s)

Section 1068 of the Intermodal Surface Transportation Efficiency Act of 1991 exempted municipal agencies serving populations of less than 100,000 from Phase I permit requirements other than sanitary landfills, power plants, and airports facilities. U.S. EPA's Phase II regulations eliminated the above exemption as of March 10, 2003. All facilities in Attachment A of this General Permit that are operated by a small municipal agency are subject to NPDES storm water permitting requirements and this General Permit.

6. Changes to General Permit Coverage

Dischargers who no longer operate a facility required to be covered under this General Permit (either NOI or NEC coverage) are required to electronically certify and submit via SMARTS a Notice of Termination (NOT). An NOT is required when there is a change in ownership of the industrial activities subject to permitting or when industrial activities subject to permitting are permanently discontinued by the Discharger at the site. When terminating NOI coverage, Dischargers may only submit an NOT once all exposure of industrial materials and equipment have been eliminated. Dischargers may not submit NOTs for temporary or seasonal facility closures. The General Permit requires Dischargers to implement appropriate BMPs to reduce or prevent pollutants in storm water discharges during the temporary facility closure.

This General Permit allows Dischargers to change General Permit coverage, as appropriate, from NOI coverage to NEC coverage or from NEC coverage to NOI coverage.

B. Discharge Prohibitions

This General Permit covers industrial storm water discharges and authorized NSWDS from industrial facilities and prohibits any discharge of materials other than storm water and authorized NSWDS (Section III and Section IV of this General Permit). It is a violation of this General Permit to discharge hazardous substances in storm water in excess of the reportable quantities established in 40 Code of Federal Regulations sections 117.3 and 302.4.

The State Water Board is authorized, under Water Code section 13377, to issue NPDES permits which apply and ensure compliance with all applicable provisions of the CWA, and any more stringent limitations necessary to implement water quality control plans, protect beneficial uses, and prevent nuisance.

C. Non-Storm Water Discharges (NSWDs)

Unauthorized NSWDS can be generated from various pollutant sources. Depending upon their quantity and location where generated, unauthorized NSWDS can discharge to the storm drain system during dry weather as well as during a storm event (comingled with storm water discharge). These NSWDS can consist of, but are not limited to; (1) waters generated by the rinsing or washing of vehicles, equipment,

buildings, or pavement, or (2) fluid, particulate or solid materials that have spilled, leaked, or been disposed of improperly.

Some NSWDs are not directly related to industrial activities and normally discharge minimal pollutants when properly managed. Section IV of this General Permit provides a limited list of NSWDs that are authorized if Dischargers implement BMPs to prevent contact with industrial materials prior to discharge. The list in Section IV is similar to the list provided in the 2008 MSGP but does not include pavement and external building surfaces washing without detergents. These two items are not included because the Discharger is responsible to reduce or prevent pollutants in storm water discharges from paved areas and buildings associated with industrial activities. Since industrial materials and non-industrial material likely co-exist, the washing of paved areas and external building surfaces may result in discharges of pollutants associated with industrial activities. In addition, washing activities generally occur during dry-weather periods when receiving water flows are lower than wet-weather periods. Wash waters are likely to discharge in higher concentrations than would occur if these pollutants were naturally discharged during a storm event. The discharge of high concentration wash water during a time of dry-weather flows is inconsistent with the goal of protecting receiving waters. These discharges are, therefore, considered unauthorized NSWDs. Similar to the 2008 MSGP, firefighting related discharges are not subject to this General Permit.

A major required element of the SWPPP is the identification and measures for elimination of unauthorized NSWDs. Unauthorized NSWDs can contribute a significant pollutant load to receiving waters. Measures to control spills, leakage, and dumping can often be addressed through BMPs. This General Permit's BMP requirements for NSWDs remain essentially unchanged from the previous permit other than the increased frequency of required visual observations from quarterly to monthly. See Section XI.A.1 of this General Permit.

D. Effluent Limitations

1. Technology-Based and Water Quality-Based Effluent Limitations

CWA Section 301(b)(1)(C) requires that discharges from existing facilities must, at a minimum, comply with technology-based effluent limitations based on the technological capability of Dischargers to control pollutants in their discharges. Discharges must also comply with any more stringent water quality-based limitations necessary to meet water quality standards in accordance with CWA Section 301(b)(1)(C). Water quality-based limitations are discussed in Section E of this Fact Sheet titled "Receiving Water Limitations." Both technology-based effluent limitations and water quality-based limitations are implemented through NPDES permits. (CWA sections 301(a) and (b).)

2. Types of Technology-Based Effluent Limitations

All NPDES permits are required to contain technology-based effluent limitations (TBELs). (40 C.F.R. §§122.44(a)(1) and 125.3.) TBELs may consist of effluent limitations guidelines (ELGs) established by U.S. EPA through regulation, or may be developed using best professional judgment on a case-by-case basis.

The CWA sets forth standards for TBELs based on the type of pollutant or the type of facility/source involved. The CWA establishes two levels of pollution control for existing sources. For the first level, existing sources that discharge pollutants directly to receiving waters were initially subject to effluent limitations based on the “best practicable control technology currently available” (BPT). (33 U.S.C. § 1314(b)(1)(B).) BPT applies to all pollutants. For the second level, existing sources that discharge conventional pollutants are subject to effluent limitations based on the “best conventional pollutant control technology” (BCT). (33 U.S.C. §1314(b)(4)(A); see also 40 C.F.R. §401.16 (list of conventional pollutants).) Also for the second level, other existing sources that discharge toxic pollutants or “nonconventional” pollutants (“nonconventional” pollutants are pollutants that are neither “toxic” nor “conventional”) are subject to effluent limitations based on “best available technology economically achievable” (BAT). (33 U.S.C. §1311(b)(2)(A); see also 40 C.F.R. §401.15 (list of toxic pollutants).) The factors to be considered in establishing the levels of these control technologies are specified in section 304(b) of the CWA and in U.S. EPA’s regulations at 40 C.F.R. §125.3.

When establishing ELGs for an industrial category, U.S. EPA evaluates a wide variety of technical factors to determine BPT, BCT, and BAT. U.S. EPA considers the specific factors of an industry such as pollutant sources, industrial processes, and the size and scale of operations. U.S. EPA evaluates the specific treatment, structural, and operational source control BMPs available to reduce or prevent pollutants in the discharges. The costs of implementing BMPs to address these factors are weighed against their effectiveness and ability to protect water quality. Factors such as industry economic viability, economies of scale, and retrofit costs are also considered.

To date, U.S. EPA has: (1) not promulgated storm water ELGs for most industrial categories, (2) not established NELs within all ELGs that have been promulgated, and (3) exempted certain types of facilities within an industrial category from complying with established ELGs. The feedlot category (40 Code of Federal Regulations part 412) provides an example of several of these points. In that instance, U.S. EPA did not establish numeric effluent limitations but instead: (1) established a narrative effluent limitation requiring retention of all feedlot-related runoff from a 25-year, 24-hour storm, and (2) limited application of the ELG to feedlots with a minimum number of animals. U.S. EPA also recently promulgated ELGs for the "Construction and Development (C&D)" industry, which included, among many other limitations, conditional numeric effluent limitations. Though the NELs in these ELGs were later stayed by U.S. EPA, the ELGs exempted construction sites of less than 30 acres from complying with the established numeric effluent limitations.

40 Code of Federal Regulations, Chapter I, Subchapter N (“Subchapter N”), includes over 40 separate industrial categories where the U.S. EPA has established ELGs for new and existing industrial wastewater discharges to surface waters, discharges to publicly owned treatment works (pre-treatment standards), and storm water discharges to surface waters. Generally, U.S. EPA has focused its efforts on the development of ELGs for larger industries and those industries with the greatest potential to pollute. In total, the 40 categories for which ELGs have been

established (not including construction) represent less than 10 percent of the types of facilities subject to this General Permit. Additionally, most ELGs focus on industrial process wastewater discharges and pre-treatment standards, and only 11 of the 40 categories establish numeric or narrative ELGs for industrial storm water discharges. Those that do include ELGs for industrial storm water discharges generally address storm water discharges that are generated from direct contact with primary pollutant sources at the subject facilities, and not the totality of the industrial storm water discharge from the facility, as the term “storm water discharge associated with industrial activity” for this General Order is defined in the CWA. (40 C.F.R. § 122.26(b)(14).) Where U.S. EPA has not issued effluent limitation guidelines for an industry, the State Water Board is required to establish effluent limitations for NPDES permits on a case-by-case basis based on best professional judgment (BPJ). (33 U.S.C. § 1342(a)(1); 40 C.F.R. § 125.3(c)(2).) In this General Permit, most of the TBELs are based on BPJ decision-making because no ELG applies.

The TBELs in this General Permit represent the BPT (for conventional, toxic, and non-conventional pollutants), BCT (for conventional pollutants), and BAT (for toxic pollutants and non-conventional pollutants) levels of control for the applicable pollutants. If U.S. EPA has not promulgated ELGs for an industry, or if a Discharger is discharging a pollutant not covered by the otherwise applicable ELG, the State Water Board is required to establish effluent limitations in NPDES permit limitations based on best professional judgment. (33 U.S.C. § 1342(a)(1); 40 C.F.R. 125.3(c).) This General Permit includes TBELs established on best professional judgment and limitations based on storm water-specific ELGs listed in Attachment F of this General Permit, where applicable.

3. Authority to Include Non-Numeric Technology-Based Limits in NPDES Permits

TBELs in this General Permit are based on best professional judgment and are non-numeric (“narrative”) technology-based effluent limitations expressed as requirements for implementation of effective BMPs. Federal regulations provide that permits must include BMPs to control or abate the discharge of pollutants when where “[n]umeric effluent limitations are infeasible.” 40 C.F.R. 122.44(k)(3).

Since 1977, courts have recognized that there are circumstances when numeric effluent limitations are infeasible and have held that EPA may issue permits with conditions (e.g., BMPs) designed to reduce the level of effluent discharges to acceptable levels. *Natural Res. Def. Council, Inc. v. Costle*, 568 F.2d 1369 (D.C.Cir.1977).

U.S. EPA has also interpreted the CWA to allow BMPs to take the place of numeric effluent limitations under certain circumstances. 40 C.F.R. §122.44(k), titled “Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs ...),” provides that permits may include BMPs to control or abate the discharge of pollutants when: (1) “[a]uthorized under section 402(p) of the CWA for the control of stormwater discharges”; or (2) “[n]umeric effluent limitations are infeasible.” 40 C.F.R. § 122.44(k).

In 2006, The U.S. Court of Appeals for the Sixth Circuit held that the CWA does not require U.S. EPA to set numeric limits where such limits are infeasible. (*Citizens Coal Council v. United States Environmental Protection Agency*, 447 F.3d 879, 895-96 (6th Cir. 2006)). The *Citizens Coal* court cited to the statement in *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 502 (2d Cir. 2005) that “site-specific BMPs are effluent limitations under the CWA” in concluding that “the EPA’s inclusion of numeric and non-numeric limitations in the guideline for the coal remaining subcategory was a reasonable exercise of its authority under the CWA.” (447 F.3d at 896.) Additionally, the *Citizen’s Coal* court cited to *Natural Res. Def. Council, Inc. v. EPA*, 673 F.2d 400, 403 (D.C.Cir.1982) noting that “section 502(11) [of the CWA] defines ‘effluent limitation’ as ‘any restriction’ on the amounts of pollutants discharged, not just a numerical restriction.” NPDES permit writers have substantial discretion to impose non-quantitative permit requirements pursuant to section 402(a)(1)), especially when the use of numeric limits is infeasible. (*NRDC v. EPA*, 822 F.2d 104, 122-24 (D.C. Cir. 1987); 40 C.F.R. 122.44(k)(3).)

4. Decision to Include Non-Numeric Technology-Based Effluent Limits in This General Permit

It is infeasible for the State Water Board to develop numeric effluent limitations using the best professional judgment approach due to lack of sufficient information. Previous versions of this General Permit required Dischargers to sample their industrial storm water discharges and report the results to the Regional Water Boards. Dischargers were not required to submit this data online into a statewide database; as a result, much of this data is not available for analysis. Moreover, much of the data that are available for analysis are not of sufficient quality to make conclusions or perform basic statistical tests.

The Blue Ribbon Panel of Experts, State Water Board staff, and many stakeholders evaluated the available storm water data set and concluded that the information provides limited value due to the limited pool of industrial facilities submitting data, poor overall data quality, and extreme variance within the dataset, as described below.

The poor quality of the existing data set is attributable a number of factors. For example, the previous permits have required Dischargers to sample during the first hour of discharge from two storm events a year. This sampling schedule was designed to catch what was considered to represent the higher end of storm water discharge concentrations for most parameters. The results from this type of sampling were thought to be an indicator of whether or not additional BMPs would be necessary. The sampling schedule was not designed, however, to estimate pollutant discharge loading, or to characterize the impact of the discharge on the receiving water. Doing so would normally require the use of more advanced sampling protocols such as flow meters, continuous automatic sampling devices, certified/trained sampling personnel, and other facility-specific considerations.

Furthermore, there is currently no data which details the relationship between the BMPs implemented at each facility and the facility’s sampling results. The SWPPPs required by the previous permits were not submitted to the Water Boards, but were

kept onsite by Dischargers. Due to the limited availability of quality sampling data and "level of effort" information contained in SWPPPs, the State Water Board is unable to exercise best professional judgment to make the connection between effluent quality (sampling results) and the level of effort, costs, and performance of the various technologies that is needed in order to express the TBELs in this General Permit numerically, as NELs.

Some stakeholders have suggested that separating the data sets by industry type would lead to more reliable data with which to develop NELs. Advocates of this approach suggest that the variability of the data may be caused in part by the mixing of data from different industrial categories. The State Water Board believes that the variation is primarily due to storm intensity, duration, time of year, soil saturation or some other factors. It is necessary to collect information related to those factors and BMPs implemented in order to evaluate the variability attributable to those factors. There is currently too large of an information gap to begin the process of developing NELs for all industrial sectors not currently subject to ELGs.

The State Water Board has proposed NELs in past drafts of this General Permit. In comments, many stakeholders have highlighted the difficulty of developing statewide NELs that are applicable to all industry sectors, or even NELs that cover any specific industry sectors. For example, stakeholders have commented that:

- a. Background/ambient conditions in some hydrogeologic zones may contribute pollutant loadings that would significantly contribute to, if not exceed, the NEL values;
- b. Some advanced treatment technologies have flow/volume limitations as well as economy of scale issues for smaller facilities;
- c. Treatment technologies that require that sheet flows be captured and conveyed via discrete channels or basins may not only result in significant retrofit costs, but may conflict with local ordinances that prohibit such practices, as they can cause damage or erosion to down gradient property owners, or cause other environmental problems;
- d. There is insufficient regulatory guidance and procedures to allow permit writers to properly specify monitoring frequency and sampling protocols (e.g., instantaneous maximum, 1-day average, 3-day average, etc.), and for Dischargers to obtain representative samples to compare to NELs for the purpose of strict compliance; and,
- e. NELs must be developed with consideration of what is economically achievable for each industrial sector. These stakeholders point out that the U.S. EPA goes to great lengths evaluating the various BMP technologies available for a particular pollutant, the costs and efficiency of each BMP, and the applicability of the BMPs to the industry as a whole or to a limited number of industrial sites based upon the size of the facility, the quantity of material, and other considerations.

The State Water Board does not have the information (including monitoring data, industry specific information, BMP performance analyses, water quality information, monitoring guidelines, and information on costs and overall effectiveness of control technologies) necessary to promulgate NELs at the time of adoption of this General Permit. Therefore, it is infeasible to include NELs in this statewide General Permit.

Many of the new requirements in this General Permit have been designed to address the shortcomings of previous permits and the existing storm water data set. Under this General Permit, sampling results must be certified and submitted into SMARTS by Dischargers, along with SWPPPs which outline the technologies and BMPs used to control pollutants at each facility. The ERA process will also collect information on costs and the engineering aspects of the various control technologies employed by each facility. Previous permit versions did not have a mechanism for receiving this site specific information electronically, and only a small percentage of Dischargers submitted their Annual Reports via SMARTS. This General Permit will make this information more accessible, allowing the Water Boards to evaluate the relationship between BMPs and the ability of facilities to meet the NALs set forth in this General Permit. Finally, the new Qualified Industrial Storm Water Practitioner (QISP) training requirements of this General Permit have been designed in part to improve the quality of the data submitted.

5. Narrative Technology-Based Effluent Limitations (TBELs) and Best Management Practices (BMPs)

The primary TBEL in this General Permit requires Dischargers to “implement BMPs that comply with the BAT/BCT requirements of this General Permit to reduce or prevent discharges of pollutants in their storm water discharge in a manner that reflects best industry practice considering technological availability and economic practicability and achievability.” (Section V.A of this General Permit). This TBEL is a restatement of the BAT/BCT standard, as articulated by U.S. EPA in the 2008 MSGP and accompanying Fact Sheet. In order to comply with this TBEL, Dischargers must implement BMPs that meet or exceed the BAT/BCT technology-based standard. The requirement to “reduce or prevent” is equivalent to the requirement in the federal regulations that BMPs be used in lieu of NELs to “control or abate” the discharge of pollutants. (40 C.F.R. § 122.44(k).)

BMPs are defined as the “scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to reduce or prevent the discharge of pollutants... includ[ing] treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.” (40 C.F.R. § 122.2.)

This General Permit (Sections X.H.1 and X.H.2) requires all Dischargers to implement minimum BMPs, as well as any advanced BMPs that are necessary to adequately reduce or prevent pollutants in discharges consistent with the TBELs. The minimum BMPs specified in this General Permit represent common practices that can be implemented by most facilities. This General Permit generally does not mandate the specific mode of design, installation or implementation for the minimum BMPs at a Discharger’s facility. It is up to the Discharger, in the first instance, to

determine what must be done to meet the applicable effluent limits. For example, Section X.H.1.a.vi of this General Permit requires Dischargers to contain all stored non-solid industrial materials that can be transported or dispersed via wind or contact with storm water. How this is achieved will vary by facility: for some facilities, all activities may be moved indoors, while for others this will not be feasible. However, even for the latter, many activities may be moved indoors, others may be contained using tarps or a containment system, while still other activities may be limited to times when exposure to precipitation is not likely. Each of these control measures is acceptable and appropriate depending upon the facility-specific circumstances.

BMPs can be actions (including processes, procedures, schedules of activities, prohibitions on practices and other management practices), or structural or installed devices to reduce or prevent water pollution. (40 C.F.R. § 122.2.) They can be just about anything that is effective at preventing pollutants from entering the environment, and for meeting applicable limits of this General Permit. In this General Permit, Dischargers are required to select, design, install, and implement facility-specific control measures to meet these limits. Many industrial facilities already have such control measures in place for product loss prevention, accident and fire prevention, worker health and safety or to comply with other environmental regulations. Dischargers must tailor the BMPs detailed in this General Permit to their facilities, as well as improve upon them as necessary to meet permit limits. The examples detailed in this Fact Sheet emphasize prevention over treatment. However, sometimes more traditional end-of-pipe treatment may be necessary, particularly where a facility might otherwise cause or contribute to an exceedance of water quality standards.

This General Permit requires Dischargers to implement BMPs “to the extent feasible.” Consistent with the control level requirements of the CWA, for the purposes of this General Permit, the requirement to implement BMPs “to the extent feasible” means to reduce and/or prevent discharges of pollutants using BMPs that represent BAT and BPT in light of best industry practice.⁴ In other words, Dischargers are required to select, design, install and implement BMPs that reduce or prevent discharges of pollutants in their storm water discharge in a manner that reflects best industry practice considering their technological availability and economic practicability and achievability.

To determine technological availability and economic practicability and achievability, Dischargers need to consider what control measures are considered “best” for their industry, and then select and design control measures for their site that are viable in terms of cost and technology. The State Water Board believes that for many facilities minimization of pollutants in storm water discharges can be achieved without using highly engineered, complex treatment systems. The BMPs included in

⁴ Because toxic and nonconventional pollutants are controlled in the first step by BPT and in the second step by BAT, and the second level of control is “increasingly stringent” (EPA v. National Crushed Stone, 449 U.S. 64, 69 (1980), for simplicity of discussion, the rest of this discussion will focus on BAT. Similarly, because the BAT levels of control in this General Permit are expressed as BMPs and pollution prevention measures, they will also control conventional pollutants. Therefore this discussion will focus on BAT rather than BCT or BPT for conventional pollutants.

this General Permit emphasize effective “low-tech” controls, such as regular cleaning of outdoor areas where industrial activities may take place, proper maintenance of equipment, diversion of storm water around areas where pollutants may be picked up, and effective advanced planning and training (e.g., for spill prevention and response).

E. Receiving Water Limitations and Water Quality Standards

Pursuant to CWA section 301(b)(1)(C) and Water Code section 13377, this General Permit requires compliance with receiving water limitations based on water quality standards. The primary receiving water limitation requires that industrial storm water discharges not cause or contribute to an exceedance of applicable water quality standards. Implementation of the BMPs as required by the technology-based effluent limitation in Section V of this General Permit will typically result in compliance with the receiving water limitations. The discussion of BMPs in this General Permit generally focuses on requiring implementation of BMPs to the extent necessary to achieve compliance with the technology-based effluent limitations, because the technology-based limitations apply similarly to all facilities. In addition, however, this General Permit also makes it clear that, if any individual facility's storm water discharge causes or contributes to an exceedance of a water quality standard, that Discharger must implement additional BMPs or other control measures that are tailored to that facility in order to attain compliance with the receiving water limitation. A Discharger that is notified by a Regional Water Board or who determines the discharge is causing or contributing to an exceedance of a water quality standard must comply with the Water Quality Based Corrective Actions found in Section XX.B of this General Permit.

Water Quality Based Corrective Actions are different from the Level 1 and Level 2 ERAs that result from effluent-based monitoring. It is possible for a Discharger to be engaged in Level 1 or Level 2 ERAs for one or more pollutants and simultaneously be required to perform Water Quality Based Corrective Actions for one or more other pollutants.

Failure to comply with these additional Water Quality Based Corrective Action requirements is a violation of this General Permit. If additional operational source control measures do not adequately reduce the pollutants, Dischargers must implement additional measures such as the construction of treatment systems and/or overhead coverage. Overhead coverage is any structure or temporary shelter that prevents the vertical contact of precipitation with industrial materials or activities. If the Regional Water Board determines that the Discharger's selected BMPs are inadequate, the Regional Water Board may require implementation of additional BMPs and/or may take enforcement against Dischargers for failure to comply with this General Permit.

F. Total Maximum Daily Loads (TMDLs)

TMDLs are regulatory tools that provide the maximum amount of a pollutant from potential source in the watershed that a water body can receive while attaining water quality standards. A TMDL is defined as the sum of the allowable loads of a single pollutant from all contributing point sources (the waste load allocations) and non-point sources (load allocations), plus the contribution from background sources. (40 C.F.R. § 130.2, subd. (i).) Discharges covered by this General Permit are considered to be point

source discharges, and therefore must comply with effluent limitations that are “consistent with the assumptions and requirements of any available waste load allocation for the discharge prepared by the State and approved by EPA pursuant to 40 Code of Federal Regulations section 130.7.” (40 C.F.R. § 122.44, subd. (d)(1)(vii).) In addition, Water Code section 13263, subdivision (a), requires that waste discharge requirements implement relevant water quality control plans. Many TMDLs in existing water quality control plans include both waste load allocations and implementation requirements. Attachment E of this General Permit lists the watersheds with U.S. EPA-approved and U.S. EPA-established TMDLs that include TMDL requirements for Dischargers covered by this General Permit.

NPDES-regulated storm water discharges (which include industrial storm water) must be addressed by waste load allocations in TMDLs. (40 C.F.R. § 130.2(h).) NPDES permits must contain effluent limits and conditions consistent with the requirements and assumptions of the waste load allocations in TMDLs. (40 C.F.R. § 122.44(d)(1)(vii)(B).) To date, the relevant waste load allocations assigned to industrial storm water discharges are not directly translatable to effluent limitations. Many of the TMDLs lack sufficient facility specific information, discharge characterization data, implementation requirements, and compliance monitoring requirements. Accordingly, an analysis of each TMDL applicable to industrial storm water discharges must be performed to determine if it is appropriate to translate the waste load allocation into a numeric effluent limit, or if the effluent limit is to be expressed narratively using a BMP approach. U.S. EPA recognizes that because storm water discharges are highly variable in frequency and duration and are not easily characterized, it is often not feasible or appropriate to establish numeric limits. Variability and the lack of data available make it difficult to determine with precision or certainty actual and projected loadings for individual Dischargers or groups of Dischargers.

Regardless of whether the effluent limit is to be numeric or narrative, the existing waste load allocations must be carefully analyzed, and in many cases translated, to determine the appropriate effluent limitations. Issues of interpretation exist with all of the waste load allocations applicable to Dischargers, and these issues vary based on the TMDL. Below is an example of one of the simpler issues:

FIGURE 1: Example Waste Load Allocations Proposed Translation: Ballona Creek Estuary – Toxic Pollutants

Metals per Acre Waste Load Allocations for Individual General Construction or Industrial Storm Water Permittees (grams/year/acre)				
Cadmium	Copper	Lead	Silver	Zinc
0.1	3	4	0.1	13
Metals per Acre Waste Load Allocations for Individual General Construction or Industrial Storm Water Permittees (milligrams/year/acre)				
Chlordane	DDTs	Total Polychlorinated biphenyl (PCBs)	Total Polycyclic aromatic hydrocarbons (PAHs)	
0.04	0.14	2	350	

In order for the above waste load allocations to effectively be implemented as effluent limits under the General Permit, the Water Boards must (1) identify which discharges the waste load allocations apply to, (2) identify the acreages of the individual facilities, (3) convert the waste load allocations from grams/year/acre (or milligrams/year/acre) to grams/year (or milligrams/year) based on the acreage at each identified facility, (4) assign the effluent limits to the identified Dischargers, (5) determine appropriate monitoring to assess compliance with the effluent limits, and (6) develop a tracking mechanism for each identified facility and their individual effluent limits. A similar stepwise process is necessary for each TMDL with waste load allocations assigned to industrial storm water discharges. For TMDLs where effluent limits will be expressed as BMPs, analysis must be performed to determine the appropriate BMPs and the corresponding effectiveness to comply with the assigned waste load allocations.

Some waste load allocations are already expressed as concentration based numbers. It may appear simple to incorporate these values into this General Permit as effluent limits, but the questions still remain regarding how to determine compliance. The monitoring requirements in this General Permit are not designed to measure compliance with a numeric effluent limit or to measure the effect of a discharge on a receiving water body. (See the discussion on monitoring requirements in Fact Sheet Section II.J.) This General Permit requires sampling of four (4) storm events a year, with certain limitations as to when a discharge may be sampled. This method of monitoring may not appropriately serve as TMDL compliance sampling since grab samples are only representative of the particular moment in time when the sample was taken. Since storm water is highly variable, four grab samples per year may not provide sufficient confidence that the effluent limit is being met. An alternative monitoring scheme may be necessary to determine the facility's impact on the receiving water and to determine compliance with any assigned effluent limits. Questions concerning whether sampling results should be grab samples, composite samples, flow-weighted averaged over all drainage areas, etc. cannot be determined for each concentration-based TMDL without a more thorough analysis.

Additionally, monitoring and assessment requirements must be developed for all of the TMDLs to determine compliance with or progress towards meeting TMDL requirements. The proposed monitoring requirements in this General Permit are not designed to assess pollutant loading or determine compliance with TMDL-specific effluent limits.

Due to the large number and variety of discharges subject to a wide range of TMDLs statewide, to prevent a severe delay in the adoption of this General Permit, TMDL-specific permit requirements for the TMDLs listed in Attachment E will be proposed by the Regional Water Boards. Since the waste load allocations and/or implementation requirements apply to multiple discharges in the region(s) the TMDL were developed, the development of TMDL-specific permit requirements is best coordinated at the Regional Water Board level. The development of TMDL-specific permit requirements is subject to notice and a public comment period prior to incorporation into this General Permit.

Regional Water Board staff, with the assistance of State Water Board staff, will develop and submit the proposed TMDL-specific permit requirements for each of the TMDLs listed in Attachment E by July 1, 2016.⁵ After conducting a 30-day public comment period, the Regional Water Boards will propose TMDL-specific permit requirements to the State Water Board for adoption into this General Permit. The Regional Water Boards may also include TMDL-specific monitoring requirements for inclusion in this General Permit, or may issue Regional Water Board orders pursuant to Water Code section 13383 requiring TMDL-specific monitoring. The Regional Water Boards or their Executive Officers may complete these tasks, and the proposed TMDL-specific permit requirements shall have no force or effect until adopted, with or without modification, by the State Water Board. Unless directed to do so by the Regional Water Board, Dischargers are not required to take any additional actions to comply with the TMDLs listed in Attachment E until the State Water Board reopens this General Permit and includes TMDL-specific permit requirements. This approach is consistent with the 2008 MSGP. TMDL-specific permit requirements are not limited by the BAT/BCT technology-based standards.

The Regional Water Boards will submit to the State Water Board the following information for each of the TMDLs listed in Attachment E:

- Proposed TMDL-specific permit requirements, including any applicable effluent limitations, implementation timelines, additional monitoring requirements, reporting requirements, an explanation of how an exceedance of an effluent limitation or a violation of the TMDL will be determined, and required deliverables consistent with the TMDL(s);
- An explanation of how the proposed TMDL-specific permit requirements, timelines, and deliverables are consistent with the assumptions and requirements of applicable waste load allocation(s) to implement the TMDL(s);
- Where a BMP-based approach is proposed, an explanation of how the proposed BMPs will be sufficient to implement applicable waste load allocations; and
- Where concentration-based monitoring is required, an explanation of how the required monitoring, reporting and calculation methodology for an exceedance of an effluent limitation or a violation of the TMDL(s) will be sufficient to demonstrate compliance with the TMDL(s).

Upon receipt of the information described above, the State Water Board will conduct a public comment period and reopen this General Permit to populate Attachment E, the Fact Sheet, and other provisions as necessary in order to incorporate these TMDL-specific permit requirements into this General Permit. Attachment E may also be reopened during the term of this General Permit to add additional TMDLs and corresponding implementation requirements.

This General Permit (Section X.G.2.a.ix) requires a Discharger to identify any additional industrial parameters that may be discharged to a waterbody with a 303(d) impairment identified in Appendix 3 as likely to be associated with industrial storm water.

⁵ Due to the workload associated with the implementation of this General Permit (e.g., training program development, NEC outreach, electronic enrollment and reporting via SMARTS) it is believed that two years is necessary for Staff to complete a comprehensive analysis and stakeholder process for TMDLs applicable to Dischargers under this General Permit.

Dischargers may need to implement additional monitoring for any applicable parameters (Section XI.B.6.e). Appendix 3 of this General Permit includes the water bodies with 303(d) impairments or TMDLs for pollutants that are likely to be associated with industrial storm water in black font, and those that are not likely to be associated with industrial storm water in red font. This determination is based on the pollutant or pollutants that are causing each impairment, and the State Water Board's general experience regarding the types of pollutants that are typically found in industrial storm water discharges. The list of waterbodies is from the State Water Boards statewide 2010 Integrated CWA Section 303(d) List / Section 305(b) Report.

Some of the water bodies with 303(d) impairments or TMDLs listed in Appendix 3 of this General Permit are not applicable to Dischargers covered under this General Permit. Appendix 3 indicates these water bodies Dischargers are not required to include in their pollutant source assessment (unless directed to do so by the Regional Water Board).

New Dischargers (as defined in Attachment C) applying for NOI coverage under this General Permit that will be discharging to an impaired water body with a 303(d) listed impairment are ineligible for coverage unless the Discharger submits data and/or information, prepared by a QISP, demonstrating that the facility will not cause or contribute to the impairment. Section VII.B of this General Permit describes the three different options New Dischargers have for making this determination. This General Permit requires a QISP to assist the New Discharger with this determination because individuals making this determination will need expertise in industrial storm water pollutant sources, BMPs and a thorough understanding of complying with U.S. EPA's storm water regulations and this General Permit's requirements. Not requiring New Dischargers to have a QISP assist in this demonstration would possibly lead to costly retrofits or closure of a new facility that has not demonstrated that the facility will not cause or contribute to the impairment.

G. Discharges Subject to the California Ocean Plan

1. Discharges to Ocean Waters

On October 16, 2012 the State Water Board amended the California Ocean Plan (California Ocean Plan) to require industrial storm water Dischargers with outfalls discharging to ocean waters to comply with the California Ocean Plan's model monitoring provisions. The amended California Ocean Plan requires industrial storm water dischargers with outfalls discharging to ocean waters to comply with the California Ocean Plan's model monitoring provisions. These provisions require Dischargers to: (a) monitor runoff for specific parameters at all outfalls from two storm events per year, and collect at least one representative receiving water sample per year, (b) conduct specified toxicity monitoring at certain types of outfalls at a minimum of once per year, and (c) conduct marine sediment monitoring for toxicity under specific circumstances (California Ocean Plan, Appendix III). The California Ocean Plan provides conditions under which some of the above monitoring provisions may be waived by the Water Boards.

This General Permit requires dischargers with outfalls that discharge to ocean waters to comply with the California Ocean Plan's model monitoring provisions and

any additional monitoring requirements established pursuant to Water Code section 13383. Dischargers who have not developed and implemented a monitoring program in compliance with the California Ocean Plan's model monitoring provisions by July 1, 2015 or seven (7) days prior to commencing operations, whichever is later, are ineligible to obtain coverage under this General Permit.

2. Areas of Special Biological Significance (ASBS) Exception

The State Water Board adopted the California Ocean Plan (California Ocean Plan) in 1972, and has subsequently amended the Plan. The California Ocean Plan prohibits the discharge of waste to designated ASBS. ASBS are ocean areas designated by the State Water Board as requiring special protection through the maintenance of natural water quality. The California Ocean Plan states that the State Water Board may grant an exception to California Ocean Plan provisions where the State Water Board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served.

On March 20, 2012, the State Water Board adopted Resolution 2012-0012 (ASBS Exception), which grants an exception to the California Ocean Plan prohibition on discharges to ASBS for a limited number of industrial storm water Discharger applicants. The ASBS Exception contains "Special Protections" to maintain natural water quality and protect the beneficial uses of the ASBS. In order to legally discharge into an ASBS, these Dischargers must comply with the terms of the ASBS Exception and obtain coverage under this General Permit. This General Permit incorporates the terms of the ASBS Exception and includes the applicable monitoring requirements for all Dischargers discharging to an ASBS under the ASBS Exception.

H. Training Qualifications

This General Permit and the previous permit both require Dischargers to ensure that personnel responsible for permit compliance have an acceptable level of knowledge. Stakeholders have observed that the previous permit did not adequately specify how to comply with various elements of the permit, such as selecting discharge locations representative of the facility storm water discharge and evaluating potential pollutant sources, nor did it provide a clearly outlined Discharger training program. Guidance that is available from outside sources can be complicated to understand or costly to obtain, which can result in many Dischargers developing and implementing deficient SWPPPs and conducting inadequate monitoring activities. Some Dischargers under the previous permit had the resources to hire professional environmental staff or environmental consultants to assist in compliance. Even in those cases, however, there was little certainty that Dischargers received training regarding implementation of the various BMPs being implemented and required monitoring activities under the previous permit. Through this General Permit, the State Water Board seeks to improve compliance and monitoring data quality, and expand each Discharger's understanding of this General Permit's requirements.

This General Permit establishes the Qualified Industrial Storm Water Practitioner (QISP) role. A QISP is someone who has completed a State Water Board sponsored or

approved QISP training course and has registered in SMARTS. A QISP is required to implement certain General Permit requirements at the facility once it has entered Level 1 status in the ERA process as described in Section XII of this General Permit. In some instances it may be advisable for a facility employee to take the training, or for a facility to hire a QISP prior to entering Level 1 status as the training will contain information on the new permit requirements and how to perform certain tasks such as selecting discharge locations representative of the facility storm water discharge, evaluating potential pollutant sources, and identifying inadequate SWPPP elements.

Some industry stakeholders have claimed that their staff is already adequately trained. These employees may continue to perform the basic permit functions (e.g. prepare SWPPPs, perform monitoring requirements, and prepare Annual Reports) without receiving any additional training if the facility's sampling and analysis results do not exceed the NALs. This requirement is structured in a manner to reduce the costs of compliance for facilities that may not negatively impact receiving water quality.

California licensed professional civil, industrial, chemical, and mechanical engineers and geologists have licenses that have professional overlap with the topics of this General Permit. The California Department of Consumer Affairs, Board for Professional Engineers, Land Surveyors and Geologists (CBPELSG) provides the licensure and regulation of professional civil, industrial, chemical, and mechanical engineers and professional geologists in California. The State Water Board is developing a specialized self-guided State Water Board-sponsored registration and training program specifically for these CPBELSG licensed engineers and geologists in good standing with CBPELSG. The CBPELSG has staff and resources dedicated to investigate and take appropriate enforcement actions in instances where a licensed professional engineer or geologist is alleged to be noncompliant with CBPELSG's laws and regulations. Actions that result in noncompliance with this General Permit may constitute a potential violation of the CBPELSG requirements and may subject a licensee to investigation by the CBPELSG.

A QISP may represent one or more facilities but must be able to perform the functions required by this General Permit at all times. It is advisable that this individual be limited to a specific geographic region due to the difficulty of performing the needed tasks before, during, and after qualifying storm events may be difficult or impossible if extensive travel is required. Dischargers are required to ensure that the designated QISP has completed the appropriate QISP training course.

This General Permit contains a mechanism that allows for the Water Boards' Executive Director or Executive Officer to rescind the registration of any QISPs who are found to be inadequately performing their duties as a QISP will no longer be able to do so. A QISP may ask the State Water Board to review any decision to revoke his or her QISP registration. Table 1 of this Fact Sheet below describes the different roles that the QISP and California licensed professional engineers have in this General Permit.

TABLE 1: Role-Specific Permit Requirements

Qualifications	Task
QISP	Assist New Dischargers determine coverage eligibility for Discharges to an impaired water body, Level 1 ERA Evaluation and report, Level 2 ERA Action Plan, and Technical Report, and the Level 2 ERA extension
California licensed professional engineer	Inactive Mining Operation Certification, SWPPPs for inactive mining, and annual re-certification of Inactive Mining Operation Certification, NONA Technical Reports, and Subchapter N calculations

I. Storm Water Pollution Prevention Plan (SWPPP)

1. General

This General Permit requires that all Dischargers develop, implement, and retain onsite a site-specific SWPPP. The SWPPP requirements generally follow U.S. EPA’s five-phase approach to developing SWPPPs, which has been adapted to reflect the requirements of this General Permit in Figure 2 of this Fact Sheet. This approach provides the flexibility necessary to establish appropriate BMPs for different industrial activities and pollutant sources. This General Permit requires a Discharger to include in its SWPPP (Section X of this General Permit) a site map, authorized NSWDs at the facility, and an identification and assessment of potential pollutants sources resulting from exposure of industrial activities to storm water.

This General Permit requires that Dischargers clearly describe the BMPs that are being implemented in the SWPPP. In addition to providing descriptions, Dischargers must also describe who is responsible for the BMPs, where the BMPs will be installed, how often and when the BMPs will be implemented, and identify any pollutants of concern. Table 2 of this Fact Sheet provides an example of how a Discharger could assess potential pollution sources and provide a corresponding BMPs summary.

This General Permit requires that Dischargers select an appropriate facility inspection frequency beyond the required monthly inspections if necessary, and to determine if SWPPP revisions are necessary to address any physical or operational changes at the facility or make changes to the existing BMPs (Section X.H.4.a.vii and Section XI.A.4 of this General Permit). Facilities that are subject to multi-phased physical expansion or significant seasonal operational changes may require more frequent SWPPP updates and facility inspections. Facilities with very stable operations may require fewer SWPPP updates and facility inspections.

Failure to develop or implement an adequate SWPPP, or update or revise an existing SWPPP as required, is a violation of this General Permit. Failure to maintain the SWPPP on-site and have it available for inspection is also a violation of this General Permit.

Dischargers are also required to submit their SWPPPs and any SWPPP revisions via SMARTS; accordingly, BMP revisions made in response to observed compliance problems will be included in the revised SWPPP electronically submitted via SMARTS. Not all SWPPP revisions are significant and it is up to the Dischargers to distinguish between revisions that are significant and those that are not significant. If no changes are made at all to the SWPPP, the Discharger is not required to resubmit the SWPPP on any specific frequency.

- **Significant SWPPP Revisions:** Dischargers are required to certify and submit via SMARTS their SWPPP within 30 days of the significant revision(s). While it is not easy to draw a line generally between revisions that are significant and those that are not significant, Dischargers are not required to certify and submit via SMARTS any SWPPP revisions that are comprised of only typographical fixes or minor clarifications.
- **All Other SWPPP Revisions:** Dischargers are required to submit revisions to the SWPPP that are determined to not be significant every three (3) months in the reporting year.

FIGURE 2: Five Phases for Developing and Implementing an Industrial Storm Water Pollution Prevention Plan (SWPPP)

PLANNING AND ORGANIZATION

- *Form Pollution Prevention Team
- *Review other facility plans

ASSESSMENT

- *Develop a site map
- *Identify potential pollutant sources
- *Inventory of materials and chemicals
- *List significant spills and leaks
- *Identify Non-Storm Water Discharges
- *Assess pollutant risk

Best Management Practice (BMP) IDENTIFICATION

- *Identify minimum required BMPs
- *Identify any advanced BMPs

IMPLEMENTATION

- *Train employees for the Pollution Prevention Team
- *Implement BMPs
- *Collect and review records

EVALUATION / MONITORING

- *Conduct annual facility evaluation (Annual Evaluation)
- *Review monitoring information
- *Evaluate BMPs
- *Review and revise SWPPP

TABLE 2: Example - Assessment of Potential Industrial Pollution Sources and Corresponding BMPs Summary

Area	Activity	Pollutant Source	Industrial Pollutant	BMPs
Vehicle and Equipment Fueling	Fueling	Spills and leaks during delivery	Fuel oil	-Use spill and overflow protection
		Spills caused by topping off fuel tanks	Fuel oil	-Train employees on proper fueling, cleanup, and spill response techniques
		Hosing or washing down fuel area	Fuel oil	-Use dry cleanup methods rather than hosing down area -Implement proper spill prevention control program
		Leaking storage tanks	Fuel oil	-Inspect fueling areas regularly to detect problems
		Rainfall running off fueling area, and rainfall running onto and off fueling area	Fuel oil	-Minimize run-on of storm water into the fueling area, cover fueling area

2. Minimum and Advanced BMPs

Section V of this General Permit requires the Discharger to comply with technology-based effluent limitations (TBELs). In this General Permit, TBELs rely on implementation of BMPs for Dischargers to reduce and prevent pollutants in their discharge. The BMP effluent limitations have been integrated into the Section X.H of this General Permit and are divided into two categories – minimum BMPs which are generally non-structural BMPs that all Dischargers must implement to the extent feasible, and advanced BMPs which are generally structural BMPs that must be implemented if the minimum BMPs are inadequate to achieve compliance with the TBELs. Section X of this General Permit includes both substantive control requirements in the form of the BMPs listed in Section X.H, as well as various reporting and recordkeeping requirements. The requirement to implement BMPs “to the extent feasible” allows Dischargers flexibility when implementing BMPs, by not requiring the implementation of BMPs that are not technologically available and economically practicable and achievable in light of best industry practices.

The 2008 MSGP requires Dischargers to comply with 12 non-numeric technology-based effluent limits in Section 2.1.2 of the permit through the implementation of “control measures.” This requirement is an expansion of the general considerations outlined in the MSGP adopted in 2000. The control measures specified by the U.S. EPA in the 2008 MSGP are as follows (in order as listed in the 2008 MSGP):

1. Minimize Exposure
2. Good Housekeeping
3. Maintenance
4. Spill Prevention and Response Procedures
5. Erosion and Sediment Controls
6. Management of Runoff
7. Salt Storage Piles or Piles Containing Salt
8. Sector Specific Non-Numeric Effluent Limits
9. Employee Training
10. Non-Storm Water Discharges (NSWDs)
11. Waste, Garbage and Floatable Debris
12. Dust Generation and Vehicle Tracking of Industrial Materials

This General Permit addresses eleven of the above twelve control measures from the 2008 MSGP Section 2.1.2 Non-Numeric Technology-Based Effluent Limits (BPT/BAT/BCT). Eleven of the control measures are addressed as minimum BMPs that the State Water Board has determined to be most applicable to California’s Dischargers. Two of those eleven control measures (1- Minimize Exposure, 6 – Management of Runoff) are also identified as advanced BMPs (Section X.H.2 of this General Permit). This General Permit is not a sector-specific permit and therefore does not contain limitations to address control measure number 8 (Sector Specific Non-Numeric Effluent Limits).

The non-structural elements of the control measure to minimize exposure are addressed in the minimum BMP Section X.H.1 of this General Permit while structural control elements are addressed in the advanced BMP Section X.H.2 of this General Permit. The on-site diversion elements of the control measure to minimize exposure are addressed as minimum BMPs.

The runoff reduction elements of the control measure to minimize exposure are included as advanced BMPs. Advanced BMPs that are required to be implemented when a Discharger has implemented the minimum BMPs to the extent feasible and they are not adequate to comply with the TBELs. The advanced BMP categories are: (1) exposure minimization BMPs, (2) storm water containment and discharge reduction BMPs, (3) treatment control BMPs, and (4) additional advanced BMPs needed to meet the effluent limitations of this General Permit. Advanced BMPs are generally structural control measures and can include any BMPs that exceed the minimum BMPs. The control measure for Non-Storm Water Discharges (NSWDs) is addressed in both the discharge prohibitions (Section III) and authorized non-storm water discharges (Section IV) of this General Permit and essentially represents a minimum BMP.

This General Permit encourages Dischargers to utilize BMPs that infiltrate or reuse storm water where feasible. The State Water Board expects that these types of BMPs will not be appropriate for all industrial facilities, but recognizes the many possible benefits (e.g. increased aquifer recharge, reduces flooding, improvements to water quality) associated with the infiltration and reuse of storm water. Encouraging the use of storm water infiltration and reuse BMPs is consistent with the statewide approach to managing storm water with lower impact methods.

The BMPs in this General Permit that coincide with the control measures in the 2008 MSGP are as follows (in order as listed in the 2008 MSGP):

a. Minimization of Exposure to Storm Water

Section 2.1.2.1 of the 2008 MSGP requires Dischargers to minimize the exposure of industrial materials and areas of industrial activity to rain, snow, snowmelt, and runoff. The 2008 MSGP mixes both structural and nonstructural BMPs and specifies particular BMPs to consider when minimizing exposure such as grading/berming areas to minimize runoff, locating materials indoors, spill clean up, contain vehicle fluid leaks or drain fluids before storing vehicles on-site, secondary containment of materials, conduct cleaning activities undercover, indoors or in bermed areas, and drain all wash water to a proper collection system.

This General Permit requires the evaluation of BMPs in the potential pollutant source assessment in the SWPPP (Section X.G.2). When the minimum BMPs are not adequate to comply with the TBELs, Dischargers are required to implement advanced BMPs (Section X.H.2.a). These advanced BMPs may include additional exposure minimization BMPs (Section X.H.2.b.1).

b. Good Housekeeping

Section 2.1.2.2 of the 2008 MSGP requires that Dischargers keep all exposed areas that may be a potential source of pollutants clean and orderly. This General Permit (Section X.H.1.a) seeks to define “clean and orderly” by specifying a required set of nine (9) minimum good housekeeping BMPs, which include: observations of outdoor/exposed areas, BMPs for controlling material tracking, BMPs for dust generated from industrial materials or activities, BMPs for rinse/wash water activities, covering stored industrial materials/waste, containing all stored non-solid industrial materials, preventing discharge of rinse/wash waters/industrial materials, prevent non-industrial area discharges from contact with industrial areas of the facility, and prevent authorized NSWDS from non-industrial areas from contact with industrial areas of the facility.

c. Preventative Maintenance

Section 2.1.2.3 of the 2008 MSGP requires that Dischargers regularly inspect, test, maintain, and repair all industrial equipment to prevent leaks, spills and releases of pollutants that may be exposed to storm water discharged to receiving waters. This General Permit (Section X.H.1.b) incorporates this

concept by requiring four (4) nonstructural BMPs which include: identification and inspection of equipment, observations of potential leaks in identified equipment, an equipment maintenance schedule, and equipment maintenance procedures.

d. Spill and Leak Prevention and Response

Section 2.1.2.4 of the 2008 MSGP requires that Dischargers minimize the potential for leaks, spills and other releases that may be exposed to storm water. Dischargers are also required to develop a spill response plan which includes procedures such as labeling of containers that are susceptible to a spill or a leakage, establishing containment measures for such industrial materials, procedures for stopping leaks/spills, and provisions for notification of the appropriate personnel about any occurrence. This General Permit (Section X.H.1.c) requires implementation of four (4) BMPs to address spills. These BMPs include: developing a set of spill response procedures to minimize spills/leaks, develop procedures to minimize the discharge of industrial materials generated through spill/leaks, identifying/describing the equipment needed and where it will be located at the facility, and identify/training appropriate spill response personnel.

e. Erosion and Sediment Controls

Section 2.1.2.5 of the 2008 MSGP requires the use of structural and/or non-structural control measures to stabilize exposed areas and contain runoff. Also required is the use of a flow velocity dissipation device(s) in outfall channels where necessary to reduce erosion and/or settle out pollutants. This General Permit (Section X.H.1.e) requires the implementation of (5) BMPs to prevent erosion and sediment discharges. The erosion and sediment control BMPs include: implementing effective wind erosion controls, providing for effective stabilization of erodible areas prior to a forecasted storm event, site entrance stabilization/prevent material tracking offsite and implement perimeter controls, diversion of run-on and storm water generated from within the facility away from all erodible materials, and ensuring compliance with the design storm standards in Section X.H.6. U.S. EPA has developed online resources for erosion and sediment controls.⁶

f. Management of Runoff

Section 2.1.2.6 of the 2008 MSGP requires the diversion, infiltration, reuse, containment, or otherwise reduction of storm water runoff, to minimize pollutants in discharges. This General Permit (Sections X.H.1.a.viii, X.H.1.d.iv., and

⁶ U.S. EPA. 2008 MSGP. <<http://cfpub.epa.gov/npdes/stormwater/msgp.cfm>> [as of February 4, 2014].
 U.S. EPA. National Menu of BMPs. <<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>>.
 [as of February 4, 2014].
 U.S. EPA. National Management Measures to Control Nonpoint Source Pollution from Urban Areas
 <<http://water.epa.gov/polwaste/nps/urban/index.cfm>>. [as of February 4, 2014].

X.H.1.e.iv) requires Dischargers to divert run-on from non-industrial sources and manage storm water generated within the facility away from industrial materials and erodible surfaces. Runoff reduction is required as an advanced BMP when minimum BMPs are not adequate to comply with the TBELs. The 2008 MSGP encouraged Dischargers to consult with EPA's internet-based resources relating to runoff management.⁷

g. Salt Storage Piles or Piles Containing Salt

Section 2.1.2.7 of the 2008 MSGP requires salt storage piles/piles containing salt that may be discharged to be enclosed or covered and to use BMPs when the salt is being used. This General Permit does not have a minimum BMP specifically for salt storage, however it does require all stockpiled/stored industrial materials be managed in a way to reduce or prevent industrial storm water discharges of the stored/stockpiled pollutants. The good housekeeping (Section X.H.1.a) and material handling and waste management (Section X.H.1.d) minimum BMPs in this General Permit require that all materials readily mobilized by storm water be covered, the minimization of handling of industrial materials or wastes that can be readily mobilized by contact with storm water during a storm event, and the diversion of run-on from stock piled materials.

h. Sector Specific Non-Numeric Effluent Limits

Section 2.1.2.8 of the 2008 MSGP requires Dischargers to achieve any additional non-numeric limits stipulated in the relevant sector-specific section(s) of Part 8 of the 2008 MSGP. This General Permit is not a sector-specific permit and does not contain sector-specific non-numeric effluent limitations like the 2008 MSGP. While this General Permit does not specify sector-specific BMPs, Dischargers are required to select and implement BMPs for their specific facility to reduce or prevent industrial storm water discharges of pollutants to comply with the technology-based effluent limitations. In addition, sectors with applicable ELGs must comply with those ELGs.

i. Employee Training Program

Section 2.1.2.9 of the 2008 MSGP requires all employees engaged in industrial activities or the handling of industrial materials that may affect storm water to obtain training covering implementation of this General Permit. This General Permit (Section X.D.1 and X.H.1.f) requires a facility to establish a Pollution Prevention Team (team members, collectively) responsible for implementing permit requirements such as the SWPPP, monitoring requirements, or BMPs.

⁷ U.S. EPA. Sector-Specific Industrial Stormwater Fact Sheet Series <www.epa.gov/npdes/stormwater/msgp>. [as of February 4, 2014].
 U.S. EPA. National Menu of Stormwater BMPs <www.epa.gov/npdes/stormwater/menuofbmps> [as of February 4, 2014].
 U.S. EPA. National Management Measures to Control Nonpoint Source Pollution from Urban Areas (and any similar State or Tribal publications) <www.epa.gov/owow/nps/urbanmm/index.html>. [as of February 4, 2014].

The five (5) minimum training BMPs include: ensuring that all team members are properly trained, preparing the proper training materials and manuals, identifying which individuals need to be trained, providing a training schedule, and maintaining documentation on the training courses and which individuals received the training.

This General Permit also requires a QISP to be assigned to each facility that reaches Level 1 status. One purpose of a QISP is to have an individual available who can provide compliance assistance with these training requirements. The QISP is responsible for training the appropriate team members. Appropriate team members are any team members involved in implementing this General Permit for drainage areas causing NAL exceedances, and any other team members identified by the QISP that need additional training to implement this General Permit.

j. NSWDs

Section 2.1.2.10 of the 2008 MSGP requires that unauthorized NSWDs are eliminated (Part 1.2.3 of the 2008 MSGP lists the NSWDs authorized by the 2008 MSGP). The good housekeeping minimum BMP (Section X.H.1.a.ix of this General Permit) requires that contact between authorized NSWDs and industrial areas of the facility be minimized. This General Permit (Section IV) also includes separate requirements for authorized NSWDs and (Section III) prohibits unauthorized NSWDs.

k. Material Handling and Waste Management

Section 2.1.2.11 of the 2008 MSGP requires that Dischargers ensure waste, garbage, and floatable debris are not discharged into receiving waters. The 2008 MSGP identifies keeping areas clean and intercepting such materials as ways to minimize such discharges. This General Permit (Section X.H.1.d) requires Dischargers to implement six (6) general BMPs that address material handling and waste management. These BMPs include: preventing or minimizing handling of waste or materials during a storm event that could potentially result in a discharge, containing industrial materials susceptible to being dispersed by the wind, covering industrial waste disposal containers when not in use to contain industrial materials, diversion of run-on and storm water generated from within the facility away from all stock piled materials, cleaning and managing spills of such wastes or materials (in accordance with Section X.H.1.e of this General Permit), and conducting observations of outdoor areas and equipment that may come into contact with such materials or waste and become contaminated.

l. Waste, Garbage and Floatable Debris

Section 2.1.2.11 of the 2008 MSGP requires that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged. Material handling and waste management BMPs are included in Section X.H.1.d of this General Permit. Dischargers are required to: prevent handling of waste materials during a storm event that could result in a discharge, contain waste disposal

containers when not in use, clean and manage spills from waste, and observe outdoor areas and equipment that may come into contact with waste and become contaminated.

m. Dust Generation and Vehicle Tracking of Industrial Materials

Section 2.1.2.12 of the 2008 MSGP requires that generation of dust and off-site tracking of raw, final, or waste materials is minimized. This General Permit does not require minimization of dust generation and vehicle tracking of industrial materials as a minimum BMP directly. Dust generation and vehicle tracking of industrial materials BMPs are included in Section X.H.1.a (“good housekeeping”) of this General Permit where Dischargers must prevent dust generation from industrial materials or activities and contain all stored non-solid industrial materials that can be transported or dispersed via wind or come in contact with storm water, and Section X.H.1.d. (“material handling and waste management”) of this General Permit, which requires Dischargers to contain non-solid industrial materials or wastes that can be dispersed via wind erosion or come into contact with storm water during handling.

n. Quality Assurance and Record Keeping

Section 2.1.2 of the 2008 MSGP does not directly designate record keeping as a control measure. This General Permit (Section X.H.1.g) includes quality assurance and record keeping as a minimum BMP and requires Dischargers to implement three (3) general BMPs. These BMPs include: developing and implementing procedures to ensure that all elements of the SWPPP are implemented, develop a method of tracking and recording the implementation of all BMPs identified in the SWPPP, and a requirement to keep and maintain those records. This ensures that management procedures are designed and permit requirements are implemented by appropriate staff.

o. Implementation of BMPs in the SWPPP

Like the previous permit, this General Permit does not assign Dischargers a schedule to implement BMPs. Instead, this General Permit requires Dischargers to select the appropriate schedule to implement the minimum BMPs. In addition, this General Permit requires Dischargers to identify, as necessary, any BMPs that should be implemented prior to precipitation events. Although Dischargers are required to maintain internal procedures to ensure the BMPs are implemented according to schedule or prior to precipitation events, Dischargers are only required to certify in the Annual Report whether they complied with the BMP implementation requirements.

Dischargers are required to implement an effective suite of BMPs that meet the technology and water-quality based limitations of this General Permit. Based upon Regional Water Board staff inspections, there is significant variation between Dischargers’ interpretations of what BMPs were necessary to comply with the previous permit. This General Permit establishes a new requirement that Dischargers must implement, to the extent feasible, specific minimum BMPs

to reduce or prevent the presence of pollutants in their industrial storm water discharge. In addition, due to the wide variety of facilities conducting numerous and differing industrial activities throughout the state, this General Permit retains the requirement from the previous permit that Dischargers establish and implement additional BMPs beyond the minimum. Implementation of this General Permit's minimum BMPs, together with any necessary advanced BMPs, will result in compliance with the effluent limitations of this General Permit (Section V.A). All Dischargers must evaluate their facilities and determine the best practices within their industry considering technological availability and economic practicability and achievability to implement these minimum BMPs and any advanced BMPs.

The State Water Board has selected minimum BMPs that are generally applicable at all facilities. The minimum BMPs are consistent with the types of BMPs normally found in properly developed SWPPPs and, in most cases, should represent a significant portion of the effort required for a Discharger to achieve compliance. Due to the diverse industries covered by this General Permit, the development of a more comprehensive list of minimum BMPs is not currently feasible. The selection, applicability, and effectiveness of a given BMP is often related to industrial activity type and to facility-specific facts and circumstances. Advanced BMPs must be selected and implemented by Dischargers, based on the type of industry and facility-specific conditions, to the extent necessary to comply with the technology-based effluent limitation requirements of this General Permit.

Failure to implement all of the minimum BMPs to the extent feasible is a violation of this General Permit. (Section X.H.1.) Dischargers must justify any determination that it is infeasible to implement a minimum BMP in the SWPPP (Section X.H.4.b). Failure to implement advanced BMPs necessary to achieve compliance with either the technology or water quality standards requirements in this General Permit is a violation of this General Permit.

p. Temporary Suspension of Industrial Activities

The exception for inactive and unstaffed sites in section 6.2.1.3 of the 2008 MSGP does not require a Discharger with a facility that is inactive and unstaffed with no industrial materials or activities exposed to storm water (in accordance with the substantive requirements in 40 Code of Federal Regulations section 122.26(g)) to complete benchmark monitoring. The Discharger is required to sign and certify a statement in the SWPPP verifying that the site is inactive and unstaffed. If circumstances change and industrial materials or activities become exposed to storm water or the facility becomes active and/or staffed, this exception no longer applies and the Discharger is required to begin complying immediately with the applicable benchmark monitoring requirements under part 6.2 of the 2008 MSGP.

This General Permit allows Dischargers to temporarily suspend monitoring at facilities where industrial activities have been suspended in accordance with Section X.H.3. This is only intended for Dischargers with facilities where it is

infeasible to comply with this General Permit's monitoring while activities are suspended (e.g. remote, unstaffed, or inaccessible facilities during the time of such a suspension). Dischargers are required to update the facility's SWPPP with the BMPs being used to stabilize the site and submit the suspension dates and a justification for the suspension of monitoring via SMARTS.

3. Design Storm Standards for Treatment Control BMPs

It is the State Water Board's intent to minimize the regulatory uncertainty and costs concerning treatment control BMPs in order to encourage the implementation of treatment control BMPs when appropriate. Section X.H.6 of this General Permit specifies a design storm standard for use when treatment controls BMPs are installed. There is both a volume-based and flow-based design storm standard in this General Permit. Both are based on the 85th percentile 24-hour storm event. Without a design storm standard, Dischargers have installed treatment controls using a wide variety of designs that were sometimes either unnecessarily stringent/expensive, or deficient in complying with the requirements of the relevant permit. Some Dischargers have been hesitant to consider treatment options because of the uncertainty concerning acceptable treatment design. The design storm standards are generally expected to:

- Be consistent with the effluent limitations of this General Permit;
- Be protective of water quality;
- Be achievable for most pollutants and their associated treatment technologies; and,
- Reduce the costs associated with treating industrial storm water discharges beyond the levels necessary to achieve compliance with this General Permit.

In lieu of complying with the design storm standards for treatment control BMPs, Dischargers may certify and submit a Level 2 ERA Technical Report, including an Industrial Activity BMPs Demonstration (Section XII.D.2.a of this General Permit). The Level 2 ERA Technical Report requirement is based upon NAL exceedances. Under this option, a Discharger with Level 2 status must either implement BMPs to eliminate future NAL exceedances, or justify what BMPs must be implemented to comply with this General Permit even if the BMPs will not eliminate future exceedances of NALs. Dischargers who implement treatment control BMPs that vary from the design storm standards in Section X.H.6 must include an analysis showing that their treatment control BMPs comply with this General Permit's effluent limitations in the Industrial Activity BMP Demonstration.

This General Permit does not require Dischargers to retrofit existing treatment controls that do not meet the design storm standard, unless the Discharger determines that the existing treatment controls are not adequate to comply with this General Permit. In addition, once TMDL-specific implementation requirements are added to this General Permit, those Dischargers subject to TMDLs may need to add

new or retrofitted treatment control BMPs to meet the TMDL implementation requirements.

To arrive at these design storm standards, the State Water Board has relied heavily on previous Water Board decisions concerning treatment efficacy for municipalities, published documents, stakeholder comments, and reasonableness. In 2000, the State Water Board issued State Water Board Order WQ 2000-11, which upheld Los Angeles Regional Water Board's permit requirements which mandated that all new development and redevelopment exceeding certain size criteria design treatment BMPs based on a specific storm volume: the 85th percentile 24-hour storm event. This design storm standard was based on research demonstrating that the standard represents the maximized treatment volume cut-off at the point of diminishing returns for rainfall/runoff frequency.⁸ On the basis of this equation, the maximized runoff volume for 85 percent treatment of annual runoff volumes in California can range from 0.08 to 0.86 inch depending on the imperviousness of the watershed area and the mean amount of rainfall. This design storm standard is referred to as the Standard Urban Storm Water Mitigation Plan's volumetric criterion and there are multiple acceptable methods of calculating this volume. For more information, see the California Stormwater Best Management Practices Handbook.⁹

The San Diego Regional Water Board first established both volumetric and flow-based design storm criteria for NPDES MS4 permits. It is generally accepted by civil engineers doing hydrology work to use twice the peak hourly flow of a specific storm event to use as the basis for flow-based design of BMPs. This General Permit therefore establishes the flow-based design storm standard to be twice the peak hourly flow of the 85th percentile 24-hour storm event.

The primary objective of specifying a design storm standard is to properly size BMPs to, at a minimum, effectively treat the first flush of run-off from all storm events. The economic impacts of treating all storm water from a facility versus the minimal environmental benefit of complete treatment justify the design storm approach. It is unrealistic to require each facility to do a cost benefit analysis of their treatment structures. To simplify the requirements for design, the State Water Board reviewed research from the City of Portland¹⁰ and the City of San Jose¹¹ to determine the volume of each rain event compared to the amount of events that occur for that volume. The results of their findings show an inflection point that is typically found at approximately the 80 to 85 percentile of recorded storm events.

⁸ California Regional Water Quality Control Board Los Angeles Region, Standard Urban Storm Water Mitigation Plans and Numerical Design Standards for Best Management Practices - Staff Report and Record of Decision (Jan. 18, 2000) <http://www.swrcb.ca.gov/rwqcb4/water_issues/programs/stormwater/susmp/susmp_final_staff_report.pdf>. [as of February 4, 2014].

⁹ California Stormwater Quality Association, Stormwater Best Management Practice New Development and Redevelopment Handbook (2003) <<http://www.casqa.org/>>. [as of February 4, 2014].

¹⁰ City of Portland Oregon. Portland Stormwater Management Manual Appendix E.1: Pollution Reduction Methodology E.1-1 (August 1, 2008). <<http://www.portlandoregon.gov/bes/article/202909>>. [as of February 4, 2014].

¹¹ California Stormwater Quality Association (CASQA). CASQA BMP Handbook (January 2003) New Development and Redevelopment (Errata 9-04) <<http://www.casqa.org/>>. [as of February 4, 2014].

Dischargers should be aware of the potential unintended public health concerns associated with treatment control BMPs. Extensive monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural BMPs, particularly those that hold standing water for over 96 hours. BMPs that produce mosquitoes create potential public health concerns and increase the burden on local vector control agencies that are mandated to inspect for and abate mosquitoes and other vectors within their jurisdictional boundaries. These unintended consequences can be lessened when BMPs incorporate design, construction, and maintenance principles developed specifically to minimize standing water available to mosquitoes¹² while having negligible effects on the capacity of the structures to provide water quality improvements. The California Health and Safety Code prohibits landowners from knowingly providing habitat for or allowing the production of mosquitoes and other vectors, and gives local vector control agencies broad inspection and abatement powers.¹³

Dischargers who install any type of volume-based treatment device are encouraged to consider the BMPs in the California Department of Public Health's guidance manual published July 2012, "Best Management Practices for Mosquito Control in California" at <http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf>.

4. Monitoring Implementation Plan

Dischargers are required to prepare and implement a Monitoring Implementation Plan (Section X.I of this General Permit). The Monitoring Implementation Plan requirements are designed to assist the Discharger in developing a comprehensive plan for the monitoring requirements in this General Permit and to assess their monitoring program. The Monitoring Implementation Plan includes a description of visual observation procedures and locations, as well as sampling procedures, locations, and methods. The Monitoring Implementation Plan shall be included in the SWPPP.

J. Monitoring and Reporting Requirements

1. General Monitoring Provisions

This General Permit requires Dischargers to develop and implement a facility-specific monitoring program. Monitoring is defined as visual observations, sampling and analysis. The monitoring data will be used to determine:

¹² California Department of Public Health. (2012). Best Management Practices for Mosquito Control in California. <<http://www.westnile.ca.gov/resources.php>>. [as of February 4, 2014]

¹³ California Health & Safety Code, Division 3, Section 2060 and following.

- a. Whether BMPs addressing pollutants in industrial storm water discharges and authorized NSWDS are effective for compliance with the effluent and receiving water limitations of this General Permit,
- b. The presence of pollutants in industrial storm water discharges and authorized NSWDS (and their sources) that may trigger the implementation of additional BMPs and/or SWPPP revisions; and,
- c. The effectiveness of BMPs in reducing or preventing pollutants in industrial storm water discharges and authorized NSWDS.

Effluent sampling and analysis information may be useful to Dischargers when evaluating the need for improved BMPs. The monitoring requirements in this General Permit recognize the 2008 MSGP approach to visual observations as an effective monitoring method for evaluating the effectiveness of BMPs at most facilities. Section 6.2 of the 2008 MSGP limits its monitoring sampling requirements to certain industrial categories. Similar to the previous permit, this General Permit requires all Dischargers to sample unless they have obtained NEC coverage or have an inactive mining operation(s) certified as allowed under this General Permit Section XIII.

This General Permit defines a Qualifying Storm Event (QSE) to provide clarity to Dischargers of when sampling is required. The previous permit (Section B.5.a) specified that sampling was required within the first hour of discharge, however, this General Permit requires Dischargers to sample within four hours of the start of Discharge. Many Dischargers were not able to get samples of their discharge locations within one (1) hour under the previous permit so this general permit has expanded the timeframe allowed to provide enough time to sample all discharge locations. The previous permit required three working dry days before sampling and this General Permit defines this period as 48 hours, this timeframe was decreased to provide more opportunities for Dischargers to obtain samples. This General Permit does not specify a volume for sampling due to the complexity of using rain gauges and the limited access of rain gauge station data.

Dischargers are only required to obtain samples required during scheduled facility operating hours and when sampling conditions are safe in accordance with Section XI.C.6.a.ii of this General Permit. If a storm event occurs during unscheduled facility operating hours (e.g. during the weekend or night) and during the 12 hours preceding the scheduled facility operating hours, the Dischargers is still responsible for obtaining samples at discharge locations that are still producing a discharge at the start of facility operations. Under the previous permit, many Dischargers were unable to obtain samples due to rainfall beginning at night.

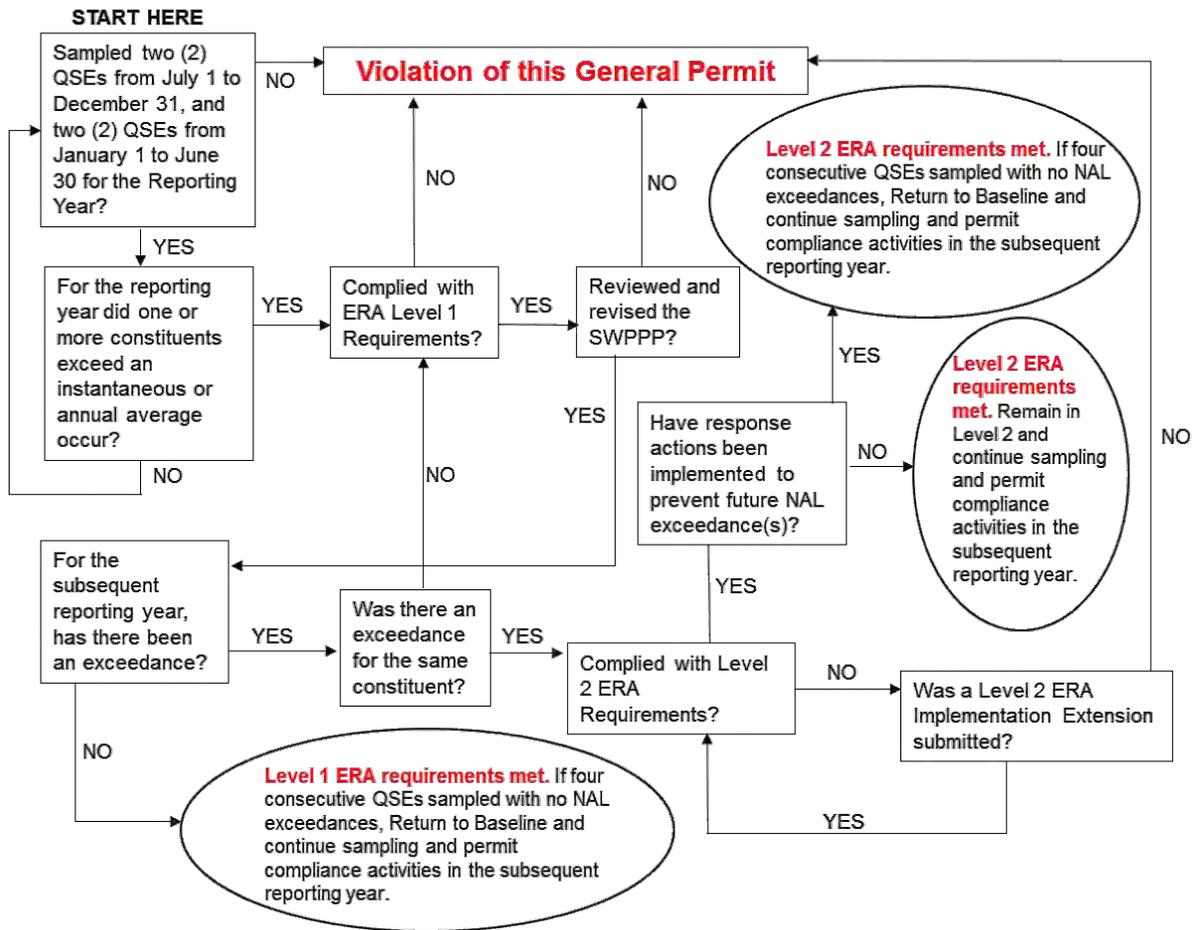
The State Water Board recognizes that it may not be feasible for all facilities to obtain four QSEs in a reporting year because there may not be enough qualifying storm events to do so. Therefore, a Discharger that is unable to collect and analyze storm water samples from two QSEs in each half of a reporting year due to a lack of QSEs is not in violation of Section XI.B.2. Dischargers that miss four QSEs during

a reporting year due to the fact that four QSEs did not occur are not required to make up these sampling events in subsequent reporting years.

The State Water Board recognizes that each facility has unique physical characteristics, industrial activities, and/or variations in BMP implementation and performance which warrants the requirement that each facility demonstrate its compliance. Figure 3 of this Fact Sheet provides a summary of all the monitoring-related requirements of this General Permit. This General Permit's monitoring requirements include sampling and analysis requirements for specific indicator parameters that indicate the presence of pollutants in industrial storm water discharges. The "indicator parameters" are oil and grease (for petroleum hydrocarbons), total suspended solids (for sediment and sediment bound pollutants) and pH (for acidic and alkaline pollutants). Additionally, Dischargers are required to evaluate their facilities and analyze samples for additional facility-specific parameters. These monitoring program requirements are designed to provide useful, cost-effective, timely, and easily obtained information to assist Dischargers as they identify their facility's pollutant sources and implement corrective actions and revise BMPs as necessary (Section XI.A.4 of this General Permit).

This General Permit requires a combination of visual observations and analytical monitoring. Visual observations provide Dischargers with immediate information indicating the presence of many pollutants and their sources. Dischargers must implement timely actions and revise BMPs as necessary (Section XI.A.4) when the visual observations indicate pollutant sources have not been adequately addressed in the SWPPP. Analytical monitoring provides an additional indication of the presence and concentrations of pollutants in storm water discharge. Dischargers are required to evaluate potential pollutant sources and corresponding BMPs and revise the SWPPP appropriately when specific types of NAL exceedances occur as described below.

FIGURE 3: Compliance Determination Flowchart



2. Visual Observations

There are two major changes to the visual observation requirements in this General Permit compared to the previous permit, which include:

a. Monthly Visual Observations

The previous permit required separate quarterly visual observations for unauthorized and authorized non-storm water discharges. It did not require periodic visual observations of the facility to determine whether all potential pollutant sources were being adequately controlled with BMPs. Prior drafts of this General Permit proposed the addition of pre-storm inspections. This was met with great resistance by Dischargers because of the complexity and burden of determining when a QSE would occur. Many of these Dischargers recommended that monthly BMP and non-storm water discharge visual observations should replace the proposed pre-storm inspections. This General Permit merges all visual observations into a single monthly visual observation.

b. Sampling Event Visual Observations

The previous permit required monthly storm water visual observations. This required Dischargers to conduct visual observations for QSEs that were not being sampled since only two QSEs were required to be sampled in the previous permit. As discussed below, the sampling requirement has been increased to four QSEs within each reporting year with two QSEs required in each half of the reporting year. We expect that this will result in more samples being collected and analyzed, since most of California experiences, on average, at least two QSEs per half year. This General Permit streamlines the storm water visual observation requirement by linking the visual observations to the time of sampling.

3. Sampling and Analysis

a. General

As part of the process for developing previous drafts of this General Permit, the State Water Board considered comments from numerous stakeholders concerning sampling and analysis. Sampling and analysis issues were the most dominant of all issues raised in the comments.

The State Water Board received stakeholder comments that fall into three primary categories concerning this General Permit's sampling and analysis approach:

- i. Comments supporting an intensive water quality sampling and analysis approach (with the goal of producing more accurate discharge-characterizing and pollutant concentration data) as the primary method of determining compliance with effluent limitations and receiving water limitations. Since this approach requires large amounts of high quality data to accurately quantify the characteristics of the discharges, it is referred to as the quantitative monitoring approach. Stakeholders supporting the quantitative approach generally also support the use of stringent NELs to evaluate compliance with this General Permit;
- ii. Comments supporting only visual observations as the primary method of determining compliance: These stakeholders generally assert that storm water sampling is an incomplete and not very cost effective means of determining water quality impacts on the receiving waters; and,
- iii. Comments supporting a combination of visual observations and cost-effective water quality sampling and analysis approach (sampling and analysis that would produce data indicating the presence of pollutants) to determine compliance (similar to the previous permit's approach). Since this approach uses more qualitative information to describe the quality and characteristics of the discharges, it is referred to as the qualitative monitoring approach.

Within each of the three categories, there are various recommendations and rationales as to the exact monitoring frequencies, procedures and methods, required to implement the approach. Stakeholders in favor of the quantitative monitoring approach commented that it is the only reliable and meaningful

method of assuring that: (1) BMPs are effective in reducing or preventing pollutants in storm water discharge in compliance with BAT/BCT, and (2) the discharge is not causing or contributing to an exceedance of a water quality standards. The stakeholders state that visual observations are not effective in measuring pollutant concentrations nor is it effective in determining the presence of colorless and/or odorless pollutants. The stakeholders state that qualitative monitoring (and the use of indicator parameters) will not provide results useful for calculating pollutant loading nor will it accurately characterize the discharge.

Stakeholders in favor of requiring only visual observations state that sampling and analysis is unnecessary because (1) the previous permit did not include NELs so the usefulness of sampling and analysis data is limited, (2) a significant majority of Dischargers should be able to develop appropriate BMPs without sampling and analysis data, (3) most pollutant sources and pollutants can be detected and mitigated through visual observations, (4) the costs associated with quantitative monitoring are excessive and disproportionate to any benefits, (5) U.S. EPA's storm water regulations do not require sampling, (6) The 2008 MSGP relies heavily on visual observations and requires only a limited number of specific industries to conduct sampling and analysis, and (7) the majority of Dischargers are small businesses and do not have sufficient training or understanding to perform accurate sampling and analysis.

Stakeholders in favor of requiring both visual observations and a cost-effective qualitative monitoring program state that (1) both are within the means and understanding of most Dischargers, and (2) monitoring results are useful for evaluating a Discharger's compliance without unnecessarily increasing the burden on the Discharger and without subjecting Dischargers to non-technical enforcement actions.

The State Water Board finds that it is feasible for the majority of Dischargers to develop appropriate BMPs without having to perform large amounts of quantitative monitoring, which can be very costly. In the absence of implementing NELs, the State Water Board has determined that the infeasibility and costs associated with developing quantitative monitoring programs at each of thousands industrial facilities currently permitted would outweigh the limited benefits. The primary difficulty associated with requiring intensive quantitative monitoring lies with the cost and the difficulty of accurately sampling industrial storm water discharges.

Stakeholders that support quantitative monitoring believe the data is necessary to determine pollutant loading, concentration, or contribution to water quality violations. In order to derive data necessary to support those goals, however, the data must be of high quality, meaning it must be accurate, precise and have an intact chain of custody. Many industrial facilities do not have well-defined storm water conveyance systems for sample collection. Storm water frequently discharges from multiple locations through sheet flow into nearby streets and adjoining properties. Sample collection from a portion of the sheet flow is an inexact measurement since not all of the flow is sampled. Requiring every Discharger to construct well-defined storm water conveyances may cost

anywhere from thousands to hundreds of thousands of dollars per facility depending on the size and nature of each industrial facility. At many facilities, the construction of such conveyances may also violate local building codes, create safety hazards, cause flooding, or increase erosion. In addition, eliminating sheet flow at some facilities could result in increased pollutant concentrations.

The State Water Board has considered the complexity and costs associated with quantitative monitoring. Unlike continuous point source discharges (e.g., publicly owned treatment works), storm water discharges are variable in intensity and duration. The concentration of pollutants discharged at any one time is dependent on many complex variables. The largest concentration of pollutants would be expected to discharge earlier in the storm event and taper off as discharges continue. Therefore, effective quantitative monitoring of storm water discharges would require that storm water discharges be collected and sampled until most or all of the pollutants have been discharged. Multiple samples would need to be collected over many hours. To determine the pollutant mass loading, the storm water discharge flow must also be measured each time a sample is collected.

For a quantitative monitoring approach to yield useful pollutant loading information, the installation of automatic sampling devices and flow meters at each discharge location would usually be necessary. In addition, qualified individuals would be needed to conduct the monitoring procedures, and to handle and maintain flow meters and automatic samplers are needed. A significant majority of storm water Dischargers under this General Permit do not possess the skills to manage such an effort. Dischargers will bear the cost of employing and/or training on-site staff to do this work, or the cost of contracting with environmental consultants and acquiring the required flow meters and automatic samplers. The cost to Dischargers to conduct quantitative monitoring varies depending on the number of outfalls, the number of storms, the length of each storm, the amount of staff training, and other variables.

To address these concerns, this General Permit includes a number of new items that bridge the gap between the previous permit's qualitative monitoring and the quantitative approach recommended by many commenters. This General Permit includes a requirement for all Dischargers to designate a QISP when they enter Level 1 status due to NAL exceedances. The QISP is required to be trained to: (1) more accurately identify discharge locations representative of the facility storm water discharge (2) select and implement appropriate sampling procedures (3) evaluate and develop additional BMPs to reduce or prevent pollutants in the industrial storm water discharges.

Dischargers that fail to develop and implement an adequate Monitoring Implementation Plan that includes both visual observations and sampling and analysis, are in violation of this General Permit. Dischargers that fail to comply with Level 1 status and Level 2 status ERA requirements, triggered by NAL exceedances, are in violation of this General Permit.

Water Code section 13383.5 requires that the State Water Board include (1) standardized methods for collection of storm water samples, (2) standardized methods for analysis of storm water samples, (3) a requirement that every sample analysis be completed by a State certified laboratory or in the field in accordance with Quality Assurance and Quality Control (QA/QC) protocols, (4) a standardized reporting format, (5) standardized sampling and analysis programs for QA/QC, and (6) minimum detection limits. The monitoring requirements in this General Permit (Section XI), as supplemented by SMARTS, address these requirements.

Under the previous permit, many Dischargers did not developed adequate sample collection and handling procedures, decreasing the quality of analytical results. In addition, Dischargers often selected inappropriate test methods, method detection limits, or reporting units. This General Permit requires all Dischargers to identify discharge locations that are representative of industrial storm water discharges and develop and implement reasonable sampling procedures to ensure that samples are not mishandled or contaminated.

It is infeasible for the State Water Board to provide a single comprehensive set of sample collection and handling procedures/instructions due to the wide variation in storm water conveyance and collection systems in use at facilities around the state. As an alternative, Attachment H of this General Permit provides minimum storm water sample collection and handling instructions that pertain to all facilities. Dischargers are required to develop facility-specific sample collection and handling procedures based upon these minimum requirements. Table 2 in this General Permit provides the minimum test methods that shall be used for a variety of common pollutants. Dischargers must be aware that use of more sensitive test methods (e.g., U.S. EPA Method 1631 for Mercury) may be necessary if they discharge to an impaired water body or are otherwise required to do so by the Regional Water Board. This General Permit allows Dischargers to propose an analytical test method for any parameter or pollutant that does not have an analytical test method specified in Table 2 or in SMARTS. Dischargers may also propose analytical test methods with substantially similar or more stringent method detection limits than existing approved analytical test methods. Upon approval, SMARTS will be updated over time to add additional acceptable analytical test methods.

The previous permit allowed Dischargers to reduce sampling analysis requirements for substantially similar drainage areas by either (1) combining samples for an unspecified maximum number of substantially similar drainage areas, or (2) sampling a reduced number of substantially similar drainage areas. The State Water Board provided this procedure to reduce analytical costs. The complexity associated with determining substantially similar drainage areas has led Dischargers to produce various, and sometimes questionable, analytical schemes. In addition, the previous permit did not establish a maximum number of samples that could be combined.

To standardize sample collection and analysis as required by Water Code section 13383.5, while continuing to offer a reduced analytic cost option, these

requirements have been revised. Section XI.B.4 of this General Permit requires Dischargers to collect samples from all discharge locations regardless of whether the discharges are substantially similar or not. Dischargers may analyze each sample collected, or may analyze a combined sample consisting of equal volumes, collected from as many as four (4) substantially similar discharge locations. A minimum of one combined sample shall be analyzed for every one (1) to four (4) discharge locations, and the samples shall be combined in the lab in accordance with Section XI.C.5 of this General Permit.

Representative sampling is only allowed for sheet flow discharges or discharges from drainage areas with multiple discharge locations. Dischargers shall select the appropriate location(s) to be sampled and intervals necessary to obtain samples representative of storm water associated with industrial activities generated within the corresponding drainage area. Dischargers are not required to sample discharge locations that have no exposure of industrial activities or materials as defined in Section XVII of this General Permit within the corresponding drainage area. However, Dischargers are required to conduct the monthly visual observations regardless of the selected locations to be sampled.

This General Permit defines a QSE as a precipitation event that produces a discharge from any drainage area that is preceded by 48 consecutive hours without a discharge from any drainage area. The previous permit did not include a QSE definition; instead, it utilized a different approach to defining the storm events that were required to be sampled. Under the previous permit, eligible storm events were storm events that occurred after three consecutive working days of dry weather. The three consecutive working days of dry weather definition in the previous permit led Dischargers to miss many opportunities to sample. Some Dischargers were unable to collect samples from two storm events in certain years under the previous definition. To resolve this difficulty, this General Permit increases the sampling requirements to four (4) QSEs per year, while decreasing the number of days without a discharge, resulting in additional opportunities for Dischargers to sample. Additionally, by eliminating the previous permit's reference to "dry weather," this General Permit allows some precipitation to occur between QSEs so long as there is no discharge from any drainage area. This change will result in more QSE sampling opportunities.

To improve clarity and consistency, the definitions contained in other storm water permits were considered with the goal of developing a standard definition for 'dry weather' for this General Permit. The 2008 MSGP sets a "measurable storm event" as one that produces at least 0.1 inches of precipitation and results in an actual discharge after 72 hours (three days) of dry weather. The State of Washington defines a "qualifying storm event" as a storm with at least 0.1 inches of precipitation preceded by at least 24 hours of no measurable precipitation, mirroring the definition found in the previous MSGP (2000 version). The State of Oregon requires that samples be taken in the first 12 hours of discharge and no less than 14 days apart. Review of other permits concludes that there is not a single commonly used approach to triggering sampling in industrial general permits. Therefore an enforceable sampling trigger is included in this General

permit that requires Dischargers to sample four storm events within each reporting year.

b. Effluent Water Quality Sampling and Analysis Parameters

Dischargers are required to sample and analyze their effluent for certain parameters. "Parameter" is a term used in laboratory analysis circles to represent a distinct, reportable measure of a particular type. For example, ammonia, hexavalent chromium, total nitrogen and chemical oxygen demand are all parameters that a laboratory can analyze storm water effluent for and report a quantity back. A parameter is also an indicator of pollution. In this General Permit, pH, total suspended solids and chemical oxygen demand are examples of indicator parameters. They are not direct measures of a water quality problem or condition of pollution but can be used to indicate a problem or condition of pollution. Indicator parameters can also be used to indicate practices and/or the presence of materials at a facility to bring forth information for compliance evaluation processes, like annual report review and inspection. For example, chemical oxygen demand concentrations can indicate the presence of dissolved organic compounds, like residual food from collected recycling materials.

Minimum parameter-specific monitoring is required for Dischargers, regardless of whether additional facility-specific parameters are selected. This General Permit requires some parameters to be analyzed and reported for the duration of permit coverage to develop comparable sampling data over time and over many storm events and to demonstrate compliance. The Regional Water Boards may use such data to evaluate individual facility compliance and assess the differences between various industries. Accordingly, the parameters selected correspond to a broad range of industrial facilities, are inexpensive to sample and analyze, and have sampling and analysis methods which are easy to understand and implement. Some analytical methods for field measurements of some parameters, such as pH, may be performed using relatively inexpensive field instruments and provides an immediate alert to possible pollutant sources.

The following three selected minimum parameters are considered indicator parameters, regardless of facility type. These parameters typically provide indication and/or the correlation of whether other pollutants are present in storm water discharge. These parameters were selected for the following reasons:

- i. pH is a numeric measurement of the hydrogen-ion concentration. Many industrial facilities handle materials that can affect pH. A sample is considered to have a neutral pH if it has a value of 7. At values less than 7, water is considered acidic; above 7 it is considered alkaline or basic. Pure rain water in California typically has a pH value of approximately 7.
- ii. Total Suspended Solids (TSS) is an indicator of the un-dissolved solids that are present in storm water discharge. Sources of TSS include sediment from erosion, and dirt from impervious (i.e., paved) areas. Many pollutants adhere to sediment particles; therefore, reducing sediment will reduce the amount of these pollutants in storm water discharge.

- iii. Oil and Grease (O&G) is a measure of the amount of O&G present in storm water discharge. At very low concentrations, O&G can cause sheen on the surface of water. O&G can adversely affect aquatic life, create unsightly floating material, and make water undrinkable. Sources of O&G include, but are not limited to, maintenance shops, vehicles, machines and roadways.

The previous permit allowed Dischargers to analyze samples for either O&G or Total Organic Carbon (TOC). This General Permit requires all Dischargers analyze samples for O&G since almost all Dischargers with outdoor activities operate equipment and vehicles can potentially generate insoluble oils and greases. Dischargers with water soluble-based organic oils may be required to also test for TOC. The TOC and O&G tests are not synonymous, duplicative or interchangeable.

This General Permit removes the requirement to analyze for specific conductance as part of the minimum analytic parameters. Specific conductance is not required by U.S. EPA for any industry type. Additionally, stakeholder comments indicate that there are many non-industrial sources that may cause high specific conductance and interfere with the efficacy of the test. For example, salty air deposition that occurs at facilities in coastal areas may raise the specific conductance in water over 500 micro-ohms per centimeter ($\mu\text{hos/cm}$). Dischargers are not prevented from performing a specific conductance test as a screening tool if it is useful to detect a particular pollutant of concern as required (e.g. salinity).

This General Permit requires Dischargers subject to Subchapter N ELGs for pH to analyze for pH using approved test methods in accordance with 40 Code of Federal Regulations part 136. These federal regulations specify that analysis of pH must take place within 15 minutes of sample collection. All other Dischargers may screen for pH using wide range litmus pH paper or other equivalent pH test kits within 15 minutes of sample collection. If in any reporting year a Discharger has two or more pH results outside of the range of 6.0 – 9.0 pH units, that Discharger is required to comply with the approved test methods in 40 Code of Federal Regulations part 136 in subsequent reporting years.

For almost all Dischargers, obtaining laboratory analysis within 15 minutes is logistically impossible. For many Dischargers, maintaining a calibrated pH meter is difficult, labor intensive, and error prone. Screening for pH will limit the number of additional Dischargers required to comply with 40 Code of Federal Regulations part 136 methods to those that have pH measures outside the range of 6.0-9.0 pH units. The use of wide range litmus pH paper or other equivalent pH test kits is not as accurate as a calibrated pH meter, however litmus paper is allowed in the 2008 MSGP, and when used properly it can provide an accurate screening measure to determine if further more-accurate pH sampling is necessary to determine compliance.

Review of available monitoring data shows that storm water discharges from most types of industrial facilities comply with the pH range of 6.0 to 9.0 pH units. There are specific types of industries, like cement or concrete manufacturers that

have shown a trend of higher pH values very close to 9.0 pH units. Rather than require all industries as a whole to monitor with the more costly 40 Code of Federal Regulations part 136 methods, this General Permit establishes a triggering mechanism for these more advanced pH test methods. The Regional Water Boards retain their authority to require more accurate test methods. Once a Discharger triggers the requirement to use the more accurate testing methods in 40 Code of Federal Regulations part 136, the Discharger may not revert back to screening for pH for the duration of coverage under this General Permit.

In the early 1990s, U.S. EPA, through its group application program, evaluated nationwide monitoring data and developed the listed parameters and SIC associations shown in Table 1 of this General Permit. The 2008 MSGP requires that Dischargers analyze storm water effluent for the listed parameters under certain conditions. In addition to the parameters in Table 1 of this General Permit, Dischargers are required to select additional facility-specific analytical parameters to be monitored, based upon the types of materials that are both exposed to and mobilized by contact with storm water. Dischargers must, at a minimum, understand how to identify industrial materials that are handled outdoors and which of those materials can easily dissolve or be otherwise transported via storm water.

The Regional Water Boards have the authority to revise the monitoring requirements for an individual facility or group of facilities based on site-specific factors including geographic location, industry type, and potential to pollute. For example, the Los Angeles Regional Water Board required all dismantlers (SIC Code 5015) within their jurisdiction to monitor for copper and zinc instead of aluminum and iron during the term of the previous permit. SMARTS will be programmed to incorporate any monitoring revisions required by the Regional Water Boards. Dischargers will receive email notification of the monitoring requirement revision and their SMARTS analytical reporting input screen will display the corresponding revisions. Dischargers may add, but not otherwise modify, the sampling parameters on their SMARTS input screen.

Dischargers are also required to identify pollutants that may cause or contribute to an existing exceedance of any applicable water quality standards for the receiving water. This General Permit requires Dischargers to control its discharge as necessary to meet the receiving water limitations, and to select additional monitoring parameters that are representative of industrial materials handled at the facility (regardless of the degree of storm water contact or relative mobility) that may be related to pollutants causing a water body to be impaired.

4. Methods and Exceptions

a. Storm Water Discharge Locations

Dischargers are required to visually observe and collect samples of industrial storm water discharges from each drainage area at all discharge locations. These samples must be representative of the storm water discharge leaving each drainage area. This is a change from the previous permit which allowed a

Discharger to reduce the number of discharge locations sampled if two or more discharge locations were substantially similar.

Dischargers are required to identify, when practicable, alternate discharge locations if: (1) the facility's industrial drainage areas are affected by storm water run-on from surrounding areas that cannot be controlled, or (2) discharge locations are difficult to observe or sample (e.g. submerged discharge outlets, dangerous discharge location accessibility).

b. Representative Sampling Reduction

Some stakeholders have indicated that there are unique circumstances where sampling a subset of representative discharge locations fully characterizes the full set of storm water discharges. Stakeholders provided examples related to drainage areas with multiple discharge locations where sampling only a subset of these discharge locations produces results that are representative of the drainage areas' storm water discharges. In such situations, this General Permit allows Dischargers to reduce the number of discharge locations. For each drainage area with multiple discharge locations (e.g. roofs with multiple downspouts, loading/unloading areas with multiple storm drain inlets), the Discharger may reduce the number of discharge locations to be sampled if the conditions in Section XI.C.4 of this General Permit are met.

c. Qualified Combined Samples

Dischargers may combine samples from up to four (4) discharge locations if the industrial activities within each drainage area and each drainage area's physical characteristics (i.e. grade, surface materials) are substantially similar.

Dischargers are required to provide documentation in the Monitoring Implementation Plan supporting that the above conditions have been evaluated and fulfilled. A Discharger may combine samples from more than four (4) discharge locations only with approval from the appropriate Regional Water Board.

d. Sample Collection and Visual Observation Exceptions

Dischargers are not required to collect samples or conduct visual observations during dangerous weather conditions such as flooding or electrical storms, or outside of scheduled facility operating hours. A Discharger is not precluded from conducting sample collection activities or visual observations outside of scheduled facility operating hours.

In the event that a Discharger is unable to collect the required samples or conduct visual observations due to the above exceptions, the Discharger must include an explanation of the conditions obstructing safe monitoring in its Annual Report. If access to a discharge location is dangerous on a routine basis, a Discharger must choose an alternative discharge location in accordance with General Permit Section XI.C.3.

e. Sampling Frequency Reduction

Facilities that do not have NAL exceedances for four (4) consecutive QSEs are unlikely to pose a significant threat to water quality. If the storm water from these facilities is also in full compliance with this General Permit, the Discharger is eligible for a reduction in sampling frequency. The Sampling Frequency Reduction allows a Discharger to decrease its monitoring from four (4) samples within each reporting year to one (1) QSE within the first half of each reporting year (July 1 to December 31) and one (1) QSE within the second half of each reporting year (January 1 to June 30). If a Discharger has a subsequent NAL exceedance after the Sampling Frequency Reduction, it must comply with the original sampling requirements of this General Permit. Only Dischargers that have baseline status or that have satisfied the Level 1 requirements are eligible for this sampling and analysis reduction.

A Discharger requesting to reduce its sampling frequency shall certify and submit a Sampling Frequency Reduction certification via SMARTS. The Sampling Frequency Reduction certification shall include documentation that the General Permit conditions for the Sampling Frequency Reduction have been satisfied.

Dischargers participating in a Compliance Group and certifying a Sampling Frequency Reduction are only required to collect and analyze storm water samples from one (1) QSE within each reporting year. These Dischargers must receive year-round compliance assistance from their Compliance Group Leader and must comply with all requirements of this General Permit.

5. Facilities Subject to Federal Storm Water Effluent Limitation Guidelines (ELGs)

Federal regulations at Subchapter N establish ELGs for industrial storm water discharges from facilities in eleven industrial sectors. For these facilities, compliance with the ELGs constitutes compliance with the technology standard of BPT, BAT, BCT, or New Source Performance Standards provided in the ELG for the specified pollutants, and compliance with the technology-based requirements in this General Permit for the specified pollutant.

K. Exceedance Response Actions (ERAs)

1. General

The previous permit did not incorporate the benchmarks from any of the MSGPs or NALs for Dischargers to evaluate sampling results. Unlike the requirements for industrial storm water discharges that cause or contribute to an exceedance of a water quality standards, the previous permit did not provide definitions, procedures or guidelines to assess sampling results. Many Regional Water Boards have formally or informally notified Dischargers that exceedances of the MSGP benchmarks should be used to determine whether additional BMPs are necessary. However, there was considerable confusion as to the extent to which a Discharger would be expected to implement actions in response to exceedances of these values, and the timelines that had to be met to prevent an enforcement action. The lack of specificity with regards to what constituted an exceedance, and what actions

are required in response to an exceedance, have been identified as a problem by the Water Boards, industry and environmental stakeholders.

This General Permit contains two (2) types of NALs. Annual NALs function similarly to, and are based upon, the values provided in the 2008 MSGP. Instantaneous maximum NALs target hot spots or episodic discharges of pollutants and are established based on California industrial storm water discharge monitoring data. When a Discharger exceeds an NAL it is required to perform ERAs. The ERAs are divided into two levels of responses and can generally be differentiated by the number of years in which a facility's discharge exceeds an NAL trigger. These two levels are explained further in Section XII of this General Permit. This ERA process provides Dischargers with an adaptive management-based process to develop and implement cost-effective BMPs that are protective of water quality and compliant with this General Permit. This process is also designed to provide Dischargers with a more defined pathway towards full compliance.

The ERA requirements in this General Permit were developed using best professional judgment and Water Board experience with the shortcomings of the previous permit's compliance procedures. Public comments received during State Water Board hearings on the 2002, 2005, 2011, 2012 and 2013 draft permits, and NPDES industrial storm water discharge permits from other states with well-defined ERA requirements were also considered by the State Water Board.

The State Water Board presumes that one single NAL exceedance for a particular parameter is not a clear indicator that a facility's discharge is out of compliance with the technology-based effluent limitations or receiving water limitations. This presumption recognizes the highly variable nature of storm water discharge and the limited value of a single quarterly grab sample to represent the quality of a facility's storm water discharge for an entire storm event and all other non-sampled storm events. With this presumption, the State Water Board is addressing costly monitoring requirements that do not bring forth valuable compliance and/or water quality information.

2. NALs and NAL Exceedances

a. This General Permit contains two types of NAL exceedances as follows:

Annual NAL exceedance - the Discharger is required to calculate the average annual concentration for each parameter using the results of all sampling and analytical results for the entire facility for the reporting year (i.e., all "effluent" data), and compare the annual average concentration to the corresponding Annual NAL values in Table 2 of this General Permit. An annual NAL exceedance occurs when the annual average of all the sampling results for a parameter taken within a reporting year exceeds the annual NAL value for that parameter listed in Table 2 of this General Permit.

For the purposes of calculating the annual average concentration for each parameter, this General Permit considers any sampling result that are a "non-detect" or less than the method detection limit as a zero (0) value. The reason to use zero (0) values instead of the detected but not quantifiable

value (minimum level or reporting limit) is that these values are very low and are unlikely to contribute to an NAL exceedance. There are statistical methods to include low values when calculations are for numeric criteria and limitations, however, the NALs in this General Permit are approximate values used to provide feedback to the Discharger on site performance, and are not numeric criteria or limitations. Therefore, it is not necessary to include these insignificant values in the calculations for the NALs. For Dischargers using composite sampling or flow measurement in accordance with standard practices, the average concentrations shall be calculated in accordance with the U.S. EPA Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Multi-Sector Storm Water General Permit.¹⁴

- i. Instantaneous maximum NAL exceedance - the Discharger is required to compare all sampling and analytical results from each distinct sample (individual or combined) to the corresponding instantaneous maximum NAL values in Table 2 of this General Permit. An instantaneous maximum NAL exceedance occurs when two or more analytical results from samples taken for any parameter within a reporting year exceed the instantaneous maximum NAL value (for TSS and O&G), or are outside of the instantaneous maximum NAL range (for pH).

b. Instantaneous maximum NAL analysis

In its June 19, 2006 report, the Blue Ribbon Panel of Experts (Panel) made several specific recommendations for how to set numeric limitations in future industrial storm water general permit(s). For sites not subject to TMDLs, the Panel suggested that the numeric values be based upon industry types or categories, with the recognition that each industry has its own specific water quality issues and financial viability. Furthermore, the Panel concluded:

To establish Numeric Limits for industrial sites requires a reliable database, describing current emissions by industry types or categories, and performance of existing BMPs. The current industrial permit has not produced such a database for most industrial categories because of inconsistencies in monitoring or compliance with monitoring requirements. The Board needs to reexamine the existing data sources, collect new data as required and for additional water quality parameters (the current permit requires only pH, conductivity, total suspended solids, and either total organic carbon or oil and grease) to establish practical and achievable Numeric Limits.

The Panel suggested an alternative method that would allow the use of the existing Water Board dataset to establish action levels, referred to as the “ranked percentile” method. The Panel recommended:

¹⁴ U.S. EPA. NPDES Storm Water Sampling Guidance Document. Web. July 1992. <<http://www.epa.gov/npdes/pubs/owm0093.pdf>>. [as of February 4, 2014].

The ranked percentile approach (also a statistical approach) relies on the average cumulative distribution of water quality data for each constituent developed from many water quality samples taken for many events at many locations. The Action Level would then be defined as those concentrations that consistently exceed some percentage of all water quality events (i.e. the 90th percentile). In this case, action would be required at those locations that were consistently in the outer limit (i.e. uppermost 10th percentile) of the distribution of observed effluent qualities from urban runoff.

After performing various data analysis exercises with the Water Board dataset, State Water Board staff concluded that the Water Board dataset is not adequate to calculate instantaneous NAL values using the Panel's recommended method for all of parameters that have annual NAL values based on the U.S. EPA benchmarks. Additionally, public comments on the January 2011 draft of this General Permit suggest that it is problematic to calculate NAL values based on the existing data. Therefore, the Water Board dataset was not used to calculate instantaneous NAL values for all parameters.

However, since all Dischargers regulated under the previous permit were required to sample for TSS and O&G/TOC, State Water Board staff found that the existing dataset for these parameters is of sufficient quality to calculate instantaneous NAL values. State Water Board staff also found that this data was less prone to what appear to be data input errors. The final dataset used to calculate the instantaneous NALs in this General Permit had outlier values that were eliminated from the dataset by using approved test method detection limits ranges. The methods and corresponding method detection limit ranges used to screen outliers are as follows:

- O&G - EPA 413.1 Applicable Range: 5-1,000 mg/L
- O&G - EPA 1664 Applicable Range: 5-1,000 mg/L
- TSS - EPA 160.2 Applicable Range: 4-20,000 mg/L

The intent of the instantaneous maximum NAL is to identify specific drainage areas of concern or episodic sources of pollution in industrial storm water that may indicate inadequate storm water controls and/or water quality impacts. In the effort to add instantaneous NAL exceedances to the ERA process, the State Water Board explored different options for the development of an appropriate value (i.e. percentile approach, benchmarks times a multiplier, confidence intervals). The California Stormwater Quality Association's comments on the previous draft permit included a proposed method for calculating NAL values using a percentile approach. The State Water Board researched and evaluated this methodology and determined it is the most appropriate way to directly compare available electronic sampling data from Dischargers regulated under the previous permit. This percentile approach was used to establish the instantaneous maximum NALs in this General Permit, for discharges to directly compare with sampling results and identify drainage areas of water quality concern.

The percentile approach is a non-parametric approach identified in many statistical textbooks for determining highly suspect values. Highly suspect values are defined as values that exceed the limits of the outer fences of a box plot. Upper limits of the outer fence are calculated by adding three times the inter-quartile range (25th to 75th percentiles) to the upper-end of the inter-quartile range (the 75th percentile). The California Stormwater Quality Association calculated an NAL value of 401 mg/L for TSS using the percentile approach using the Water Board dataset. The State Water Board performed the same analysis with the same Water Board dataset and calculated a slightly different value of 396 mg/L; therefore, the instantaneous maximum NAL value for TSS of 400 mg/L was established. Applying the percentile approach to the existing O&G data results in the instantaneous maximum NAL value for O&G of 25 mg/L.

The State Water Board compared existing sampling data to the instantaneous maximum NAL values and concluded that seven (7) percent of the total samples exceeded the highly suspected value for TSS and 7.8 percent of the total samples exceeded the highly suspected value for O&G. These results suggest that the instantaneous maximum NAL values are adequate to identify drainage areas of concern statewide since they are not regularly exceeded. Using best professional judgment, the State Water Board concludes that an exceedance of these values twice within a reporting year is unlikely to be the result of storm event variability or random BMP implementation problems, and the use of the percentile approach is therefore appropriate.

Due to issues with the ranges of concentrations and the logarithmic nature of pH, statistical methods cannot be applied to pH in the same ways as other parameters. Review of storm water sampling data by the State Water Board and other stakeholders has shown that pH is not typically a parameter of concern for most industrial facilities. Accordingly, a range of pH limits established in Regional Water Board Basin Plans is implemented in this General Permit for the instantaneous maximum NAL values. Most Basin Plans set a water quality objective of 6.0 - 9.0 pH units for water bodies, an exceedance outside the range of 6.0 - 9.0 pH units is consistent with the water quality concerns for pH among Regional Water Boards. An industrial facility with proper BMP implementation is expected to have industrial storm water discharges within the range of 6.0 - 9.0 pH units.

High concentrations of TSS and O&G, or pH values outside the range of 6.0 – 9.0 pH units, in a discharge may be an indicator of potential BMP implementation or receiving water quality concerns with other pollutants with parameters that do not have an instantaneous maximum NAL value. The State Water Board may consider instantaneous maximum NAL values for other parameters in a subsequent reissuance of this General Permit, based on data collected during this General Permit term.

The percentile approach is considered by many stakeholders to be the best method to evaluate BMP performance and general effluent quality in a community or population where the vast majority of the industrial facilities are implementing sufficient pollutant control measures. The Water Board's current

dataset does not provide a way of evaluating actual BMP implementation at each facility when analyzing the data; therefore the monitoring information reported during the previous permit term cannot be linked to compliance with technology-based standards. The State Water Board intends to use data collected during this General Permit term to evaluate the percentile approach, improve the quality of collected data for other parameters, and further develop an understanding of how reported data relates to implemented BMP-control technologies.

Under this General Permit, a Discharger enters Level 1 status and must fulfill the Level 1 status ERA requirements following its first occurrence of any NAL exceedance. Level 2 status ERA requirements follow the second occurrence of an NAL exceedance for the same parameter in a subsequent reporting year. This ERA process provides Dischargers with an adaptive management-based process to develop and implement cost-effective BMPs that are protective of water quality and compliant with this General Permit. This General Permit's ERA process is designed to have a well-defined compliance end-point. It is not a violation of this General Permit to exceed the NAL values; it is a violation of the permit, however, to fail to comply with the Level 1 status and Level 2 status ERA requirements in the event of NAL exceedances.

The State Water Board acknowledges that storm water discharge concentrations are often highly variable and dependent upon numerous circumstances such as storm size, the time elapsed since the last storm, seasonal activities, and the time of sample collection. Since there are potential enforcement consequences for failure to comply with this General Permit's ERA process, the State Water Board's intention is to use NAL exceedances to solely require Dischargers with recurring annual NAL exceedances or drainage areas that produce recurring instantaneous maximum NAL exceedances to be subject to the follow-up ERA requirements.

If NALs exceedances do not occur, the State Water Board generally expects that the Discharger has implemented sufficient BMPs to control storm water pollution. When NAL exceedances do occur, however, the potential that the Discharger may not have implemented appropriate and/or sufficient BMPs increases, and the Discharger is required to implement escalating levels of ERAs. If NAL exceedances occur, this General Permit requires Dischargers to evaluate and potentially install additional BMPs, or re-evaluate and improve existing BMPs to be in compliance with this General Permit.

3. Baseline Status

At the beginning of a Discharger's NOI coverage under this General Permit, the Discharger has Baseline status. A Discharger demonstrating compliance with all NALs will remain at Baseline status and is not required to complete Level 1 status and Level 2 status ERA requirements.

If a Discharger has returned to Baseline status (from Level 2 status) and additional NAL exceedances occur, the Discharger goes into Level 1 status, then potentially

Level 2 status. Dischargers do not go directly into Level 2 status from Baseline status.

4. Level 1 Status

Regardless of when an NAL exceedance occurs during Baseline status, a Discharger's status changes from Baseline status to Level 1 status on July 1 of the subsequent reporting year. By October 1 following the commencement of Level 1 status, the Discharger is required to appoint a QISP to assist with the completion of the Level 1 Evaluation. The Level 1 Evaluation must include a review of the facility's SWPPP for compliance with the effluent and receiving water limitations of this General Permit, an evaluation of the industrial pollutant sources at the facility that are or may be related to the NAL exceedance(s), and identification of any additional BMPs that will eliminate future exceedances. When conducting the Level 1 Evaluation, a Discharger must ensure that all potential pollutant sources that could be causing or contributing to the NAL exceedance(s) are fully characterized, that the current BMPs are adequately described, that employees responsible for implementing BMPs are appropriately trained, and that internal procedures are in place to track that BMPs are being implemented as designed in the SWPPP. A Discharger is additionally required to evaluate the need for additional BMPs. Level 1 ERAs are designed to provide the Discharger the opportunity to improve existing BMPs or add additional BMPs to comply with the requirements of this General Permit.

By January 1 following commencement of Level 1 status, a Discharger is required to certify and submit via SMARTS a Level 1 ERA Report prepared by a QISP. The Level 1 ERA Report must contain a summary of the Level 1 Evaluation, all new or revised BMPs added to the SWPPP.

In most cases, the State Water Board believes that Level 1 status BMPs will be operationally related rather than structural and, therefore can be implemented without delay. Recognizing that a Discharger should not be penalized for sampling results obtained before implementing BMPs, sampling results for parameters and their corresponding drainage areas that caused the NAL exceedance up to October 1 or the date the BMPs were implemented, whichever is sooner, will not be used for calculating NAL exceedances. Although this General Permit allows up to January 1 to implement Level 1 status BMPs, the State Board has chosen an interim date of October 1 to encourage more timely Level 1 BMP implementation. Dischargers who implement Level 1 BMPs after October 1 may risk obtaining subsequent sampling results that may cause them to go into Level 2 status.

5. Level 2 Status

Level 2 ERAs are required during any subsequent reporting year in which the same parameter(s) has an NAL exceedance (annual average or instantaneous maximum), if this occurs, a Discharger's status changes from Level 1 status to Level 2 status on July 1 of the subsequent reporting year. Dischargers with Level 2 status must further evaluate BMP options for their facility. Dischargers may have to implement additional BMPs, which may include physical, structural, or mechanical devices that

are intended to prevent pollutants from contacting storm water. Examples of such controls include, but are not limited to:

- Enclosing and/or covering outdoor pollutant sources within a building or under a roofed or tarped outdoor area.
- Physically separating the pollutant sources from contact with run-on of uncontaminated storm water.
- Devices that direct contaminated storm water to appropriate treatment BMPs (e.g., discharge to sanitary sewer as allowed by local sewer authority).
- Treatment BMPs including, but not limited to, detention ponds, oil/water separators, sand filters, sediment removal controls, and constructed wetlands.

Dischargers may select the most cost-effective BMPs to control the discharge of pollutants in industrial storm water discharges. Where appropriate, BMPs can be designed and targeted for various pollutant sources (e.g., providing overhead coverage for one potential pollutant while discharging to a detention basin for another source may be the most cost-effective solution).

a. Level 2 ERA Action Plans

The State Water Board acknowledges that there may be circumstances that make it difficult, if not impossible, for a Discharger to immediately implement additional BMPs. For example, it may take time to get a contract for construction in place, obtain necessary building permits, and design and construct the BMPs. Dischargers may also suspect that pollutants are from a non-industrial or natural background source and need time to study their site. A Discharger is required to certify and submit an Action Plan prepared by a QISP via SMARTS by January 1 following the reporting year in which the NAL exceedance that resulted in the Discharger entering Level 2 occurred. The Level 2 ERA Action Plan requires a Discharger to propose actions necessary to complete the Level 2 ERA Technical Report, the demonstrations the Discharger has selected, and propose a time frame for implementation.

If a Discharger changes the QISP assisting with the Level 2 ERA requirements this General Permit requires the Discharger to update the QISP information via SMARTS. Current information on individuals assisting Dischargers with compliance of this General Permit provides the Water Boards with the necessary contact information if there are questions on the submitted documents, and for possible verification of a QISP's certification.

Dischargers are required to address each Level 2 NAL exceedance in an Action Plan. The State Water Board recognizes that Dischargers with Level 2 status may have multiple parameters or facility areas that have Level 2 NAL exceedances and the timing of the exceedances may make it very difficult to address all Level 2 NAL exceedances in one Action Plan. When Level 2 ERA exceedances occur in subsequent reporting years, after an Action Plan is

certified and submitted, a Discharger will need to develop an Action Plan for this new Level 2 NAL exceedance. This General Permit defines new Level 2 NAL exceedances as an exceedance for a new parameter in any drainage area at the facility, or an exceedance for the same parameter being addressed in an existing Action Plan, but where the exceedance occurred in a different drainage area than identified in the existing Action Plan.

b. Level 2 ERA Technical Reports

The Level 2 ERA Technical Report contains three different options that require a Discharger to submit demonstrations showing the cause of the NAL exceedance(s). This General Permit requires a Discharger to appoint a QISP to prepare the Level 2 ERA Technical Reports. The State Water Board acknowledges that there may be cases where a combination of the demonstrations may be appropriate; therefore a Discharger may combine any of the following three demonstration options in their Level 2 ERA Technical Report when appropriate. A Discharger is only required to annually update its Level 2 ERA Technical Report when necessary as defined in Section XII.D.3.c of this General Permit, and is not required to annually re-certify and re-submit the entire Level 2 ERA Technical Report. If there are no changes prompting an update of the Level 2 ERA Technical Report, as specified in Section XII.D.3.c of this General Permit, the Discharger will provide this certification in the Annual Report that there have been no changes warranting re-submittal of the Level 2 ERA Technical Report.

i. Industrial Activity BMPs Demonstration

The Industrial Activity BMPs Demonstration is for the following:

- Dischargers who decided to implement additional BMPs that are expected to eliminate future NAL exceedance(s) and that have been implemented in order to achieve compliance with the technology-based effluent limitations of this General Permit, and
- Dischargers who decided to implement additional BMPs that may not eliminate future NAL exceedance(s) and that have been implemented in order to achieve compliance with the technology-based effluent limitations of this General Permit.

When preparing the Industrial Activity BMPs Demonstration, the QISP shall identify and evaluate all individual pollutant source(s) associated with industrial activity that are or may be related to an NAL exceedance and all designed, information on the drainage areas associated with the Level 2 NAL exceedances, and installed BMPs that are implemented to reduce or prevent pollutants in industrial storm water discharges in compliance with this General Permit.

If an Industrial Activity BMPs Demonstration is submitted as the Level 2 ERA Technical Report and the Discharger is able to show reductions in pollutant concentrations below the NALs for four (4) subsequent consecutive QSEs, the Discharger returns to Baseline Status. A Discharger that submits an Industrial Activity BMPs Demonstration but has not installed additional BMPs that are expected to eliminate future NAL exceedance(s) will remain with Level 2 status but is not subject to additional ERAs unless directed by the Regional Water Board.

ii. Non-Industrial Pollutant Source Demonstration

A Non-Industrial Pollutant Source Demonstration is for a Discharger to demonstrate that the pollutants causing the NAL exceedances are not related to industrial activities conducted at the facility, and additional BMPs at the facility will not contribute to the reduction of pollutant concentrations.

Dischargers including the Non-Industrial Pollutant Demonstration in their Level 2 ERA Technical Report shall have a QISP determine that the sources of non-industrial pollutants in storm water discharges are not from industrial activity or natural background sources within the facility.

Sources of non-industrial pollutants that are discharged separately and are not comingled with storm water associated with industrial activity are not considered subject to this General Permit's requirements. When pollutants from non-industrial sources are comingled with storm water associated with industrial activity, the Discharger is responsible for all the pollutants in the combined discharge unless the technical report clearly demonstrates that the NAL exceedances due to the combined discharge are solely attributable to the non-industrial sources. The pollutant may also be present due to industrial activities, in which case the Discharger must demonstrate that the pollutant contribution from the industrial activities by itself does not result in an NAL exceedance. In most cases, the Non-Industrial Pollutant Source Demonstration will contain sampling data and analysis distinguishing the pollutants from non-industrial sources from the pollutants generated by industrial activity.

Once the Level 2 ERA Technical Report, including this demonstration is certified and submitted via SMARTS, the Discharger has satisfied all the requirements necessary for that pollutant for ERA purposes. A Discharger that submits a Non-Industrial Pollutant Demonstration remains with Level 2 status but is not subject to additional ERAs unless directed by the Regional Water Board.

iii. Natural Background Pollutant Source Demonstration

The benchmark monitoring schedule in section 6.2.1.2 of the 2008 MSGP allows a Discharger to determine that the exceedance of the benchmark is attributable solely to the presence of that pollutant in the natural background. A Discharger making this determination is not required to perform corrective

action or additional benchmark monitoring providing that the other 2008 MSGP requirements are met. The 2008 MSGP Fact Sheet requires Dischargers to include in the following in the SWPPP: 1) map(s) showing the reference site location, facility, available land cover information, reference site and test site elevation, available geology and soil information for reference and test sites, photographs showing site vegetation, site reconnaissance survey data and records. This General Permit requires this information to be included in the Natural Background Pollutant Source Demonstration in Section XII.D.2.c.

The Natural Background Pollutant Source Demonstration in this General Permit is for a Discharger that can demonstrate that pollutants causing the NAL exceedances are not related to industrial activities conducted at the facility, and are solely attributable to the presence of those pollutants in natural background. The pollutant may also be present due to industrial activities, in which case the Discharger must demonstrate that the pollutant contribution from the industrial activities by itself does not result in an NAL exceedance. Natural background pollutants include those substances that are naturally occurring in soils or groundwater that have not been disturbed by industrial activities. Natural background pollutants do not include legacy pollutants from earlier activity on a site, or pollutants in run-on from neighboring sources which are not naturally occurring. Dischargers are not required to reduce concentrations for pollutants in the effluent caused by natural background sources if these pollutants concentrations are not increased by industrial activity.

The 2008 MSGP Fact Sheet states that the background concentration of a pollutant in runoff from a non-human impacted reference site in the same watershed must be determined by evaluation of ambient monitoring data or by using information from a peer-reviewed publication or a local, state, or federal government publication specific to runoff or storm water in the immediate region. Studies that are in other geographic areas, or are clearly based on different topographies or soils, are not sufficient to meet this requirement. When such data is not available, and there are no known sources of the pollutant, the background concentration should be assumed to be zero.

In cases where historic monitoring data from a site are used for generating a natural background concentration, and the site is no longer accessible or able to meet reference site acceptability criteria, the Discharger must submit documentation (e.g., historic land use maps) indicating the site did meet reference site criteria (such as indicating the absence of human activity) during the time data collection occurred.

Once the Level 2 ERA Technical Report, including a Natural Background Demonstration meeting the conditions in Section XII.D.2.c of this General Permit is certified and submitted via SMARTS, the Discharger is no longer responsible for the identified background parameters(s) in the corresponding drainage area(s). A Discharger that submits this type of demonstration will

remain with Level 2 status but is not subject to additional ERAs unless directed by the Regional Water Board.

c. **Level 2 ERA Implementation Extension**

The State Water Board recognizes that there may be circumstances that make implementation of all necessary actions required in the Level 2 ERAs by the permitted due dates infeasible. In such circumstances a Discharger may request additional time by submitting a Level 2 ERA Implementation Extension. The Level 2 ERA Implementation Extension will automatically allow Dischargers up to an additional six (6) months to complete the tasks identified in the Level 2 ERA Action Plans while remaining in compliance with this General Permit. The Level 2 ERA Implementation Extension is subject to Regional Water Board review. If additional time is needed beyond the initial six (6) month extension, a second Level 2 ERA Implementation Extension may be submitted but is not effective unless it is approved by the Water Board.

L. Inactive Mining Operations

Inactive mining sites may need coverage under this General Permit. Inactive mining operations are mining sites, or portions of sites, where mineral mining and/or dressing occurred in the past with an identifiable Discharger (owner or operator), but are no longer actively operating. Inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials. A Discharger has the option to certify and submit via SMARTS that its inactive mining operations meet the conditions for an Inactive Mining Operation Certification in Section XIII of this General Permit. The Discharger must have a SWPPP for an inactive mine signed (wet signature with license number) by a California licensed professional engineer. The Inactive Mining Operation Certification in this General Permit is in lieu of performing certain identified permit requirements. This General Permit requires an annual inspection of an inactive mining site and an annual re-certification of the SWPPP. Any significant updates to the SWPPP shall be signed (wet signature and license number) by a California license professional engineer. The Discharger must certify and submit via SMARTS any significantly revised SWPPP within 30 days of the revision(s)

M. Compliance Groups and Compliance Group Leaders

Group Monitoring, as defined in the previous permit, has been eliminated in this General Permit and replaced with a new compliance option called Compliance Groups. The Compliance Group option differs from Group Monitoring as it requires (1) all Dischargers participating in a Compliance Group (Compliance Group Participants) sample two QSEs each year, (2) the Compliance Group Leader to inspect each Participant's facility within each reporting year, (3) the Compliance Group Leader must complete a State Water Board sponsored or approved training program for Compliance Group Leaders, and (4) the Compliance Group Leader to prepare Consolidated Level 1 ERA Reports, and individual Level 2 ERA Action Plans and Technical Reports. The Compliance Group option is similar to Group Monitoring as it retains a mechanism that

allows Dischargers of the same industry type to comply with this General Permit through shared resources in a cost saving manner.

This General Permit emphasizes sampling and analysis as a means to evaluate BMP performance and overall compliance, and the significantly reduced sampling requirements previously afforded to Group Monitoring Participants (two samples within a five-year period) does not provide the necessary information to achieve these goals. However, a moderate reduction in sampling requirements is included as an incentive for Compliance Group Participants while concurrently requiring sufficient individual facility sampling data to determine compliance. A Compliance Group Leader is required to provide the necessary sampling training and guidance to the Compliance Group Participants. This additional training requirement will increase sampling data quality that will offset the reduced sampling frequency for Compliance Groups.

Participation in Compliance Groups will provide additional cost savings for Dischargers in the preparation of the Consolidated Level 1 ERA Reports, and for Compliance Group Leader assistance in preparing the Level 2 ERA Action Plans and the individual Level 2 ERA Technical Reports. It is likely that many of the pollutant sources causing NAL exceedances, and the corresponding BMP cost evaluation and selection, when appropriate, will overlap for groups of facilities in a similar industry type. When these overlaps occur, a Compliance Group Leader should be able to more efficiently evaluate the pollutant sources and BMP options, and prepare the necessary reports.

The State Water Board believes that it is necessary for Compliance Group Leaders to have a higher level of industrial storm water compliance and training experience than the expectations of a QISP. Many stakeholder comments on this General Permit suggested various certifications to provide this higher level of experience; however, the State Water Board believes a process similar to the Trainer of Record process for the Construction General Permit training program will develop Compliance Group Leaders with the appropriate level of experience to fulfill the necessary qualifications.

The intent of the Compliance Groups is to have only one or a small number of Compliance Groups per industrial sector. The process for becoming a QISP trainer and/or a Compliance Group Leader is purposely similar to the Construction General Permit trainer of record process for consistency within storm water regulatory leaders. The formal process to qualify to conduct trainings for QISPs and/or to be a Compliance Group Leader will include the submittal of a statement of qualifications for review, a review fee, completion of an exam and training specific to this role. For more information see the Construction General Permit trainer of record process: <http://www.casqa.org/TrainingandEducation/ConstructionGeneralPermitTrainingQSDQSPToR/tabid/205/Default.aspx>

After the initial Compliance Group registration, Compliance Group Leaders are required to submit and maintain their list of Compliance Group Participants via SMARTS. There are no additional administrative documents required. The previous permit required group leaders to provide annual group evaluation reports and a letter of intent to continue group monitoring. The State Water Board found these items to be resource intensive and placed an unnecessary administrative burden on group leaders. The

Compliance Group requirements in this General Permit reduces the administrative burden on both the Compliance Group Leaders and Water Board staff.

The State Water Board's intent for the effluent data, BMP selection, cost, and performance information, and other industry specific information provided in Compliance Group reports is for evaluation of sector-specific permitting approaches and the use of NALs in the next reissuance of this General Permit.

N. Annual Evaluation

Federal regulations require NPDES industrial storm water Dischargers to evaluate their facility and SWPPP annually. Typically this requires an inspection of the facility to ensure: (1) the SWPPP site map is up to date, (2) control of all potential pollutant sources is included in the SWPPP, and (3) sampling data and visual observation records are used to evaluate if the proper BMPs are being implemented. As Dischargers are required to conduct monthly visual observation that partially overlap with the actions required by the annual evaluation requirements, Dischargers may perform the annual evaluation inspection concurrent with a monthly visual observation.

O. Annual Report

All Dischargers shall certify and submit via SMARTS an Annual Report no later than July 15 following each reporting year. The reporting requirements for this General Permit's Annual Report are streamlined in comparison to the previous permit. The Annual Report now consists of two primary parts: (1) a compliance checklist indicating which permit requirements were completed and which were not (e.g., a Discharger who completes the required sampling of four QSEs during the reporting year, versus a Discharger who is only able to sample two QSEs during the reporting year), and (2) an explanation for items on the compliance checklist that were determined incomplete by the Discharger. Unlike the previous permit, the Annual Report does not require Dischargers to provide the details of each visual observation (such as name of observer, time of observation, observation summary, corrective actions, etc.) or provide the details of the Annual Comprehensive Site Evaluation. Dischargers, however, continue to be required to retain those records and have them available upon request. The Annual Report is further simplified through the immediate electronic reporting via SMARTS of sampling data and copies of the original laboratory reports instead of such information being included in the Annual Report.

P. Conditional Exclusion - No Exposure Certification (NEC) Requirements

This General Permit's conditional exclusion requirements are similar to the requirements provided in 40 C.F.R. section 122.26(g)(3). Clarifications were added in this General Permit, however, to the types of "storm resistant shelters" and the periods when "temporary shelters" may be used in order to avert regulatory confusion. California does not have operating coal power plants, which are a major contributor to acid rain elsewhere in the United States. California does have nonpoint sources or atmospheric deposition that may locally impact the pH of the rain water, however this is

not categorized as acid rain as referred to by the U.S. EPA for the NEC coverage requirements. The No Exposure Guidance Document¹⁵ developed by the U.S. EPA mentions acid rain as a potential source of contaminants to consider for NEC coverage. The acid rain leachate language was not included in this General Permit's Appendix 2 to clarify that Dischargers may qualify for NEC coverage, even if the facility has metal buildings or structures.

The Discharger shall certify and submit complete PRDs for NEC coverage via SMARTS. Based upon the State Water Board's experience with reissuing and implementing the 2009 Construction General Permit, the transition for existing Dischargers to register under this new General Permit is staff resource intensive. The State Water Board staff is available to assist Dischargers requiring assistance with enrolling under this General Permit, both for NOI coverage and NEC coverage. The State Water Board has also experienced that more time is needed for its staff to assist Dischargers registering for NEC coverage. To provide better customer service to all Dischargers, three months have been added to the NEC coverage PRD submittal schedule for new and existing Dischargers (Section II.B.4 of this General Permit, extending the NEC coverage registration date to October 1, 2015).

Dischargers must annually inspect their facility to ensure continued compliance with NEC requirements, and annually re-certify and submit an NEC via SMARTS. Based on its regulatory experience, the State Water Board has determined that a five-year NEC re-certification period is inadequate. A significant percentage of facilities may revise, expand, or relocate their operations in any given year. Furthermore, a significant percentage of facilities experience turnover of staff knowledgeable of the NEC requirements and limitations. Accordingly, the State Water Board believes that annual NEC evaluation and re-certification requirements are appropriate to continually assure adequate program compliance.

Q. Special Requirements - Plastic Materials

Water Code section 13367 requires the Water Boards to implement measures that control discharges of preproduction plastic from point and nonpoint sources. The State Water Board intends to use this General Permit to regulate discharges of preproduction plastics from areas of facilities that are subject to this General Permit. A Regional Water Board may designate facilities, or areas of facilities, that are not otherwise subject to this General Permit, pursuant to Section XIX.F. For example, a Regional Water Board may designate Plastic Materials handling areas of a transportation facility that are not associated with vehicle maintenance as requiring coverage under this General Permit.

Preproduction plastics used by the plastic manufacturing industry are small in size and have the potential to mobilize in storm water. Preproduction plastic washed into storm water drains can move to waters of the United States where it contributes to the growing problem of plastic debris in inland and coastal waters. Water Code section 13367

¹⁵ U.S. EPA. Guidance Manual for Conditional Exclusion from Storm Water Permitting Based On "No Exposure" of Industrial Activities to Storm Water. Web. June 2000. < <http://www.epa.gov/npdes/pubs/noxguide.pdf>>. [as of January 31, 2014].

outlines five mandatory BMPs that are required for all facilities that handle preproduction plastic. These mandatory BMPs are included in this General Permit.

The State Water Board has received comments regarding the Water Code requirements for Plastics Facilities to install a containment system for on-site storm drain locations that meet 1mm capture and 1-year 1-hour storm flow requirement standards. As a result, this General Permit includes the option under Water Code section 13367 that allows a plastics facility to propose an alternative BMP or suite of BMPs that can meet the same performance and flow requirements as a 1mm capture and 1-year 1-hour storm flow containment system standards. These alternative BMPs are to be submitted to the Regional Water Board for approval. This alternative is intended to allow the facility to develop BMPs that focus on pollution prevention measures that can perform as well as, or better than, the containment system otherwise required by the statute.

The State Water Board also includes two additional containment system alternatives in this General Permit that are considered to be equivalent to, or better than, the 1mm capture and 1-year 1-hour storm flow requirements:

- An alternative allowing plastic facilities to implement a suite of eight BMPs addressing the majority of potential sources of plastic discharges. This suite of BMPs is based on industry and U.S. EPA recommendations and Water Board experience with storm water inspections, violations, and enforcement cases throughout California.
- An alternative allowing a facility to operate in a manner such that all preproduction plastic materials are used indoors and pose no potential threat for discharge off-site. The facility is required to notify the Regional Water Board of the intent to seek this exemption and of any changes to the facility or operations that may disqualify the facility for the exemption. The exemption may be revoked by the Regional Water Board at any time.

Plastics facilities may use preproduction plastic materials that are less than 1mm in size, or produce materials, byproducts, or waste that is smaller than 1mm in size. These small size materials will pass through the 1mm capture containment system required by Water Code section 13367. Plastics facilities with sub-1mm materials must design a containment system to capture the smallest size material onsite with a 1-year 1-hour storm flow requirement, or propose alternative BMPs for Regional Water Board approval that meet the same requirements.

The remaining BMPs required by Water Code section 13367 are consistent with recommendations for handling and clean-up of preproduction plastics in the American Chemistry Council publication, *Operation Clean Sweep* and U.S. EPA's publication *Plastic Pellets in the Aquatic Environment: Sources and Recommendations*. The State Water Board believes that the entire approach in this General Permit for plastic materials is consistent with Water Code section 13367.

R. Regional Water Board Authorities

The Regional Water Boards retain discretionary authority over many issues that may arise from industrial discharges within their respective regions. This General Permit

emphasizes the authority of the Regional Water Boards over specific requirements of this General Permit that do not meet region-specific water quality protection regulatory needs.

S. Special Conditions: Requirements for Dischargers Claiming the “No Discharge” Option in the Notice of Non-Applicability

1. General

Entities that operate facilities generating storm water associated with industrial activities that is not discharged to waters of the United States are not required to obtain General Permit coverage. Entities that have contacted the Water Boards to inquire what is necessary to avoid permit coverage have received inconsistent guidance. This has resulted in regulatory inconsistency and uncertainty as to whether they are in compliance if their industry operates without General Permit coverage. Depending upon how each Regional Water Board handles “No Discharge” claims, some facilities with advanced containment design may be required to obtain General Permit coverage while other facilities with less advanced containment design may be allowed to operate without General Permit coverage. Some stakeholders have complained that this type of regulatory inconsistency puts some facilities at an economically-competitive disadvantage given the costs associated with permit compliance.

U.S. EPA regulations do not provide a design standard, definition, or guidance as to what constitutes “No Discharge.” Unlike Conditional Exclusion requirements, U.S. EPA regulations do not require an entity to submit technical justification or certification that a facility does not discharge to waters of the United States (U.S.). Therefore entities have previously been allowed to self-determine that their facility does not discharge to water of the U.S. when using any containment design standard. The State Water Board does not have available information showing that most entities have adequately performed hydraulic calculations to determine the frequency of discharge corresponding to their containment controls or have had these hydraulic calculations reviewed or completed by a California licensed professional engineer. Although U.S. EPA makes clear that an unpermitted discharge to waters of the U.S. is a violation of the CWA, this leaves regulatory agencies with the very difficult task of knowing when any given facility discharges in order to carry-out enforcement actions.

In 1998, the Water Code was amended to require entities who are requested by the Water Boards to obtain General Permit coverage, but that have a valid reason to not obtain General Permit coverage, to submit a Notice of Non-Applicability (NONA). (Wat. Code, § 13399.30, subd. (a)(2)). The NONA covers multiple reasons why an entity is not required to be permitted including (1) facility closure, (2) not the legal owner, (3) incorrect SIC code, (4) eligibility for the Conditional Exclusion (No Exposure Certification), and (5) the facility not discharging to water of the U.S. (“No Discharge”). The previous permit contained definitions, requirements, and guidance that entities may reference to determine whether they are eligible to select any of the first four NONA reasons for not obtaining General Permit coverage. However, neither the previous permit nor the Water Code provide definitions, requirements,

and guidance for entities to determine whether they are eligible to indicate “No Discharge” on the NONA as a reason for not obtaining General Permit coverage.

This General Permit addresses and resolves the issues discussed above by establishing consistent, statewide eligibility requirements in Section XX.C for entities submitting NONAs indicating “No Discharge.” When requested by the Water Boards to obtain General Permit coverage, entities must meet these “No Discharge” eligibility requirements or obtain General Permit coverage. The Water Boards retain enforcement authority if a facility subsequently discharges.

2. “No Discharge” Eligibility Requirements

The entity must certify submit in SMARTS a NONA Technical Report signed (wet signature and license number) by a California licensed professional engineer that contains the analysis and details of the containment design supporting the “No Discharge” eligibility determination. Because containment design will require hydraulic calculations, soil permeability analysis, soil stability calculations, appropriate safety factor consideration, and the application of other general engineering principles, state law requires the technical report to be signed (wet signature and license number) by a California licensed professional engineer.

The State Water Board has selected a containment design target that, as properly applied will result in few, if any, discharges. The facility must either be:

- a. Engineered and constructed to contain all storm water associated with industrial activities from discharging to waters of the United States. (The determination of what is a water of the United States can be complicated, and in certain circumstances, a discharge to groundwater that has a direct hydrologic connection to waters of the United States may constitute a discharge to a water of the United States.) Dischargers must base their information upon maximum historic precipitation event data (or series of events) from the nearest rain gauges as provided by the National Oceanic and Atmospheric Administration’s (NOAA) website, or other nearby precipitation data available from other government agencies. At a minimum, Dischargers must ensure that the containment design addresses maximum 1-hour, 24-hour, weekly, monthly, and annual precipitation data for the duration of the exclusion.

Design storm events are generally specified as a one-time expected hydraulic failure over a recurrence of years for a specified storm event. For example, if a design storm standard is a 100 year 24-hour event, then a facility’s containment system designed to contain the maximum volume of water would be expected to fall in 24 hours once every 100 years. Design standards vary dependent upon the regulatory program and the level of protection needed. Since California has considerable variations in climate/topography/soil conditions across the state, the “No Discharge” NONA eligibility requirements have been created so that each facility’s containment design can incorporate unique site specific circumstances to meet the requirement that discharges will not occur based upon past historical precipitation data. Facilities that are not designed to not meet the “No Discharge” eligibility requirements must obtain General Permit coverage.

- b. Located in basins or other physical locations that are not hydrologically connected to waters of the United States.

The State Water Board considered allowing Entities to review United States Army Corp of Engineer maps to determine, without a California licensed professional engineer, whether their facility location is within a basin and/or other physical location that is not hydrologically connected to waters of the United States. The State Water Board believes that this determination can be difficult in some cases, or is likely to be performed incorrectly. In addition, there may be areas of the state that are not hydrologically connected to waters of the United States, but are not on United States Army Corps of Engineer maps. Therefore, all “No Discharge” Technical Reports must be signed (wet signature and license number) by a California licensed professional engineer.

3. Additional Considerations

The “No Discharge” determination does not cover storm water containment systems that transfer industrial pollutants to groundwater. Entities must determine whether designs that incorporate infiltration may discharge to and contaminate groundwater. If there is a threat to groundwater, Entities must contact the Regional Water Boards prior to construction of infiltration design elements.

Entities that have not eliminated all discharges that are subject to General Permit coverage (NOI Coverage or NEC Coverage) are ineligible to submit NONAs indicating “No Discharge.”

ATTACHMENT A

FACILITIES COVERED BY NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

1. Facilities Subject To Storm Water Effluent Limitations Guidelines, New Source Performance Standards, or Toxic Pollutant Effluent Standards Found in 40 Code of Federal Regulations, Chapter I, Subchapter N (Subchapter N):

Cement Manufacturing (40 C.F.R. Part 411); Feedlots (40 C.F.R. Part 412); Fertilizer Manufacturing (40 C.F.R. Part 418); Petroleum Refining (40 C.F.R. Part 419), Phosphate Manufacturing (40 C.F.R. Part 422), Steam Electric (40 C.F.R. Part 423), Coal Mining (40 C.F.R. Part 434), Mineral Mining and Processing (40 C.F.R. Part 436), Ore Mining and Dressing (40 C.F.R. Part 440), Asphalt Emulsion (40 C.F.R. Part 443), Landfills (40 C.F.R. Part 445), and Airport Deicing (40 C.F.R. Part 449).
2. Manufacturing Facilities:

Facilities with Standard Industrial Classifications (SICs) 20XX through 39XX, 4221 through 4225. (This category combines categories 2 and 10 of the previous general permit.)
3. Oil and Gas/Mining Facilities:

Facilities classified as SICs 10XX through 14XX, including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 Code of Federal Regulations. 434.11(1) because the performance bond issued to the facility by the appropriate Surface Mining Control and Reclamation Acts authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with any overburden, raw material, intermediate products, finished products, by-products, or waste products located on the site of such operations. Inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator. Inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined material; or sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim.
4. Hazardous Waste Treatment, Storage, or Disposal Facilities:

Hazardous waste treatment, storage, or disposal facilities, including any facility operating under interim status or a general permit under Subtitle C of the Federal Resource, Conservation, and Recovery Act.
5. Landfills, Land Application Sites, and Open Dumps:

Landfills, land application sites, and open dumps that receive or have received industrial waste from any facility within any other category of this Attachment; including facilities subject to regulation under Subtitle D of the Federal Resource, Conservation, and Recovery Act, and facilities that have accepted wastes from construction activities (construction activities include any clearing, grading, or excavation that results in disturbance).
6. Recycling Facilities:

Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093.
7. Steam Electric Power Generating Facilities:

Any facility that generates steam for electric power through the combustion of coal, oil, wood, etc.
8. Transportation Facilities:

Facilities with SICs 40XX through 45XX (except 4221-25) and 5171 with vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication) or other operations identified under this Permit as associated with industrial activity.
9. Sewage or Wastewater Treatment Works:

Facilities used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge, that are located within the confines of the facility, with a design flow of one million gallons per day or more, or required to have an approved pretreatment program under 40 Code of Federal Regulations part 403. Not included are farm lands, domestic gardens, or lands used for sludge management where sludge is beneficially reused and are not physically located in the confines of the facility, or areas that are in compliance with Section 405 of the Clean Water Act.

ATTACHMENT B

ACRONYM LIST

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITIES
(GENERAL PERMIT)

ASBS	Areas of Special Biological Significance
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPT	Best Practicable Control Technology Currently Available
CBPELSG	California Board for Professional Engineers, Land Surveyors and Geologists
DWQ	Division of Water Quality
ELGs	Effluent Limitations Guidelines and New Source Performance Standards
ERA	Exceedance Response Action
MS4	Municipal Separate Storm Sewer System
MSGP	Multi Sector General Permit
NAL	Numeric Action Level
NAICS	North American Industrial Classification System
NEC	No Exposure Certification
NEL	Numeric Effluent Limitation
NOI	Notice of Intent
NONA	Notice of Non Applicability
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
NSWD	Non Storm Water Discharges
O&G	Oil and Grease
PRDs	Permit Registration Documents
QA/QC	Quality Assurance/Quality Control
QISP	Qualified Industrial Storm water Practitioner
QSE	Qualifying Storm Event
SIC	Standard Industrial Classification
SMARTS	Storm Water Multiple Application and Report Tracking System
SWPPP	Storm Water Pollution Prevention Plan
TBEL	Technology Based Effluent Limitation
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TSS	Total Suspended Solids
U.S. EPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WQBEL	Water Quality Based Effluent Limitation

ATTACHMENT C

GLOSSARY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

Adoption Date April 1, 2014

Aerial Deposition

Total suspended particulate matter found in the atmosphere as solid particles or liquid droplets. Chemical composition of particulates varies widely, depending on location and time of year. Sources of airborne particulates include but are not limited to: dust, emissions from industrial processes, combustion products from the burning of wood and coal, combustion products associated with motor vehicle or non-road engine exhausts, and reactions to gases in the atmosphere. Deposition is the act of these materials being added to a landform.

Beneficial Uses

As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation, include but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT)

As defined by United States Environmental Protection Agency (U.S. EPA), BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)

As defined by U.S. EPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

Best Professional Judgment (BPJ)

The method used by permit writers to develop technology-based NPDES permits conditions on a case-by-case basis using all reasonably available and relevant data.

GLOSSARY

Best Management Practices (BMPs)

Scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Chain of Custody

Form used to track sample handling as samples progress from sample collection to the laboratory. The chain of custody is also used to track the resulting analytical data from the laboratory to the client. Chain of custody forms can be obtained from an analytical laboratory upon request.

Debris

Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

Detected Not Quantifiable

A sample result that is between the Method Detection Limit (MDL) and the Minimum Level (ML).

Discharger

A person, company, agency, or other entity that is the operator of the industrial facility covered by this General Permit.

Drainage Area

The area of land that drains water, sediment, pollutants, and dissolved materials to a common discharge location.

Effective Date

The date, set by the State Water Resources Control Board (State Water Board), when at least one or more of the General Permit requirements take effect and the previous permit expires. This General Permit requires most of the requirements (such as SMARTs submittals, minimum BMPs, sampling and analysis requirements) to take effect on July 15, 2015.

Effluent

Any discharge of water either to the receiving water or beyond the property boundary controlled by the Discharger.

Effluent Limitation

Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants that are discharged from point sources into waters of the United States, waters of the contiguous zone, or the ocean.

GLOSSARY

Erosion

The process by which soil particles are detached and transported by the actions of wind, water or gravity.

Erosion Control BMPs

Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Facility

A collection of industrial processes discharging storm water associated with industrial activity within the property boundary or operational unit.

Field Measurements

Testing procedures performed in the field with portable field-testing kits or meters.

Good Housekeeping BMPs

BMPs designed to reduce or eliminate the addition of pollutants through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Industrial Materials

Includes, but is not limited to: raw materials, recyclable materials, intermediate products, final products, by product, waste products, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERLCA); any chemical the facility is required to report pursuant to Section 313 of Title III of Superfund Amendments and Reauthorization Act (SARA); fertilizers; pesticides; and waste products such as ashes, slag, and sludge and that are used, handled, stored, or disposed in relation to a facility's industrial activity.

Method Detection Limit

The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.

Minimum Level

The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Monitoring Implementation Plan

Planning document included in the Storm Water Pollution Prevention Plan (SWPPP). Dischargers are required to record information on the implementation of the monitoring requirements in this General Permit. The MIP should include relevant information on:

GLOSSARY

the Monthly Visual Observation schedule, Sampling Parameters, Representative Sampling Reduction, Sample Frequency Reduction, and Qualified Combined Samples.

Monitoring Requirements

Includes sampling and analysis activities as well as visual observations.

Natural Background

Pollutants including substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from previous activity at a facility, or pollutants in run-on from neighboring sources which are not naturally occurring.

New Discharge(r)

A facility from which there is a discharge, that did not commence the discharge at a particular site prior to August 13, 1979, which is not a new source as defined in 40 Code of Federal Regulations 122.29, and which has never received a finally effective NPDES permit for discharges at that site. See 40 Code of Federal Regulations 122.2.

Numeric Action Level (NAL) Exceedance

Annual NAL exceedance - the Discharger shall determine the average concentration for each parameter using the results of all the sampling and analytical results for the entire facility for the reporting year (i.e., all "effluent" data) and compare this to the corresponding Annual NAL values in Table 2. For Dischargers using composite sampling or flow measurement in accordance with standard practices, the average concentrations shall be calculated in accordance with the U.S. EPA Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Multi-Sector Storm Water General Permit.¹ An annual NAL exceedance occurs when the average of all the analytical results for a parameter from samples taken within a reporting year exceeds an annual NAL value for that parameter listed in Table 2 (or is outside the NAL pH range);

Instantaneous maximum NAL exceedance - the Discharger shall compare all sampling and analytical results from each distinct sample (individual or composite) to the corresponding Instantaneous maximum NAL values in Table 2. An instantaneous maximum NAL exceedance occurs when two or more analytical results from samples taken for any parameter within a reporting year exceed the instantaneous maximum NAL value (for TSS and O&G), or are outside of the instantaneous maximum NAL range (for pH).

Non Detect

Sample result is less than Method Detection Limit; Analyte being tested cannot be detected by the equipment or method.

¹ U.S. EPA. NPDES Storm Water Sampling Guidance Document. <<http://www.epa.gov/npdes/pubs/owm0093.pdf>>. [as of July 3, 2013]

GLOSSARY

Non-Storm Water Discharges (NSWDs)

Discharges that do not originate from precipitation events. Including but not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

Numeric Action Level (NAL)

Pollutant concentration levels used to evaluate if best management practices are effective and if additional measures are necessary to control pollutants. NALs are not effluent limits. The exceedance of an NAL is not a permit violation.

Operator

In the context of storm water associated with industrial activity, any party associated with an industrial facility that meets either of the following two criteria:

- a. The party has operational control over the industrial SWPPP and SWPPP specifications, including the ability to make modifications to those plans and specifications
- b. The party has day-to-day operational control of activities at the facility which are necessary to ensure compliance with a SWPPP for the facility or other permit conditions (e.g., authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

pH

Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6.0 and 9.0, with neutral being 7.0.

Plastic Materials

Plastic Materials are virgin and recycled plastic resin pellets, powders, flakes, powdered additives, regrind, dust, and other similar types of preproduction plastics with the potential to discharge or migrate off-site.

Qualified Industrial Storm Water Practitioner (QISP)

Only required once a Discharger reaches Level 1 status, a QISP is the individual assigned to ensure compliance with this General Permit or to assist New Dischargers with determining coverage eligibility for discharges to an impaired water body. A QISP's responsibilities include implementing the SWPPP, performing the Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation), assisting in the preparation of Annual Reports, performing ERAs, and training appropriate Pollution Prevention Team members. The individual must take the appropriate state approved or sponsored training to be qualified. Dischargers shall ensure that the designated QISP is geographically located in an area where they will be able to adequately perform the permit requirements at all of the facilities they represent.

GLOSSARY

Qualifying Storm Event (QSE)

A precipitation event that:

- a. Produces a discharge for at least one drainage area; and
- b. Is preceded by 48 hours with no discharge from any drainage area.

Regional Water Board

Includes the Executive Officer and delegated Regional Water Board staff.

Runoff Control BMPs

Measures used to divert run-on from offsite and runoff within the site.

Run-on

Discharges that originate offsite and flow onto the property of a separate facility or property or, discharges that originate onsite from areas not related to industrial activities and flow onto areas on the property with industrial activity.

Scheduled Facility Operating Hours

The time periods when the facility is staffed to conduct any function related to industrial activity, but excluding time periods where only routine maintenance, emergency response, security, and/or janitorial services are performed.

Sediment

Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation

Process of deposition of suspended matter carried by water, wastewater, or other liquids that flow by gravity. Control of sedimentation is accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

Sediment Control BMPs

Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. Includes those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (i.e., silt fence, sediment basin, fiber rolls, etc.).

Sheet Flow

Flow of water that occurs overland in areas where there are no defined channels and where the water spreads out over a large area at a uniform depth.

Source

Any facility or building, property, road, or area that causes or contributes to pollutants in storm water.

GLOSSARY

Storm Water

Storm water runoff, snowmelt runoff, and storm water surface runoff and drainage.

Storm Water Discharge Associated With Industrial Activity

The discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant as identified in Attachment A of this General Permit. The term does not include discharges from facilities or activities excluded from the NPDES program. The term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials; manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process wastewaters (as defined at 40 C.F.R. section 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. The term does not include discharges from facilities or activities excluded from the NPDES program under 40 C.F.R. section 122.

Material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product, or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are federally, State, or municipally owned or operated that meet the description of the facilities listed in this paragraph) include those facilities designated under 40 C.F.R. section 122.26(a)(1)(v).

Structural Controls

Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution.

Total Suspended Solids (TSS)

The measure of the suspended solids in a water sample including inorganic substances such as soil particles, organic substances such as algae, aquatic plant/animal waste, and particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

GLOSSARY

Toxicity

The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses, such as impaired reproduction or growth anomalies.

Trade Secret

Information, including a formula, pattern, compilation, program, device, method, technique, or process, that: (1) derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use; and (2) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

Turbidity

The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

Waters of the United States

Generally refers to surface waters, as defined for the purposes of the federal Clean Water Act.

Water Quality Objectives

Defined in the California Water Code as limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

Water Quality Standards

Consists of beneficial uses, water quality objectives to protect those uses, an antidegradation policy, and policies for implementation. Water quality standards are established in Regional Water Quality Control Plans (Basin Plans) and statewide Water Quality Control Plans. U.S. EPA has also adopted water quality criteria (the same as objectives) for California in the National Toxics Rule and California Toxics Rule.

ATTACHMENT D

PERMIT REGISTRATION DOCUMENTS (PRDs)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

This Attachment provides an example of the information Dischargers are required to submit in the PRDs via the Storm Water Multiple Application and Report Tracking System (SMARTS). The actual PRD requirements are in Section II of this General Permit.

A. Who Must Submit PRDs

All Dischargers that operate facilities as described in Attachment A of this General Permit are subject to either Notice of Intent (NOI) or No Exposure Certification (NEC) Coverage and shall comply with the PRD requirements in this General Permit.

B. Who Is Not Required to Submit PRDs

Dischargers that operate facilities described below are not required to submit PRDs:

1. Facilities that are not described in Attachment A;
2. Facilities that are described in Attachment A but do not have discharges of storm water associated with industrial activity to waters of the United States; or,
3. Facilities that are already covered by an NPDES permit for discharges of storm water associated with industrial activity.

C. Annual Fees for NOI and NEC Coverage

Annual Fees for NOI and NEC coverage are established through regulations adopted by the State Water Board and are subject to change (see California Code of Regulations, title 23, section 2200 et seq.).

D. When and How to Apply

Dischargers proposing to conduct industrial activities subject to this General Permit must electronically certify and submit PRDs via the Storm Water Multiple Application

PERMIT REGISTRATION DOCUMENTS (PRDS)

Reporting and Tracking System (SMARTS)¹ no less than seven (7) days prior to the commencement of industrial activity. Existing Dischargers must submit PRDs for NOI coverage by July 1, 2015 or for NEC coverage by October 1, 2015.

E. PRD Requirements for NOI Coverage

1. Notice of Intent (NOI) and Signed Electronic Authorization Form.
2. Site Map (Section X.E of this General Permit).
3. Storm Water Pollution Prevention Plan (see Section X of this General Permit).

F. Description of PRDs for NOI Coverage

1. The Notice of Intent (NOI) requires the following information:

- a. Operator/Owner Information

Operator/Owner Company or Organization Name
 Contact First Name
 Contact Last Name
 Title
 Street Address
 Address Line 2
 City/State/Zip
 Phone (e.g. 999-999-9999)
 E-mail (e.g. abc@xyz.com)
 Federal Tax ID

- b. Facility Information

Facility Name
 WDID Number (if applicable)
 Contact First Name
 Contact Last Name
 Title
 Street Address
 Address Line 2
 City
 County
 Phone (e.g. 999-999-9999)

¹ The State Water Board has developed the SMARTS online database system to handle registration and reporting under this General Permit. More information regarding SMARTS and access to the database is available online at <<https://smarts.waterboards.ca.gov>>. [as of June 26, 2013].

PERMIT REGISTRATION DOCUMENTS (PRDS)

Emergency Phone (e.g. 999-999-9999)
 E-mail (abc@xyz.com)
 State/Zip CA
 Total Site Size (Acres)
 Latitude (Decimal degrees only, minimum 5 significant digits, e.g. 99.99999)
 Longitude (Decimal degrees only, minimum 5 significant digits, e.g. 99.99999)
 Total Percentage Site Imperviousness Area of Facility (Acres)
 Total Areas of Industrial Activities and Materials Exposed to Precipitation
 Primary SIC Code
 Secondary SIC Code
 Tertiary SIC Code
 Regional Water Board

c. Billing Information

Billing Name
 Contact First Name
 Contact Last Name
 Title
 Street Address
 Address Line 2
 City/State/Zip
 Phone (e.g. 999-999-9999)
 E-mail (e.g. abc@xyz.com)

d. Receiving Water Information

Does your facility's storm water flow directly or indirectly into waters of the US such as river, lake, ocean, etc. (check box for directly or indirectly)

- i. Indirectly to waters of the US
- ii. Storm drain system - Enter owner's name:
- iii. Directly to waters of the US (e.g., river, lake, creek, stream, bay, ocean, etc.)
- iv. Name of the receiving water: _____

PERMIT REGISTRATION DOCUMENTS (PRDS)

2. The Site Map(s) shall include the following Information:
 - a. The facility boundary;
 - b. Storm water drainage areas within the facility boundary;
 - c. Portions of any drainage area impacted by discharges from surrounding areas and flow direction of each drainage area;
 - d. On-facility surface water bodies;
 - e. Areas of soil erosion;
 - f. Location(s) of nearby water bodies (such as rivers, lakes, wetlands, etc.);
 - g. Location(s) of municipal storm drain inlets that may receive the facility's industrial storm water discharges and authorized Non-Storm Water Discharges (NSWDs);
 - h. Locations of storm water collection and conveyance systems and associated points of discharge, and direction of flow;
 - i. Any structural control measures (that affect industrial storm water discharges, authorized NSWDs, and run-on);
 - j. All impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures;
 - k. Locations where materials are directly exposed to precipitation;
 - l. Locations where significant spills or leaks identified (Section X.G.1.d of this General Permit) have occurred;
 - m. Areas of industrial activity subject to this General Permit;
 - n. All storage areas and storage tanks;
 - o. Shipping and receiving areas;
 - p. Fueling areas;

PERMIT REGISTRATION DOCUMENTS (PRDS)

- q. Vehicle and equipment storage/maintenance areas;
 - r. Material handling and processing areas;
 - s. Waste treatment and disposal areas;
 - t. Dust or particulate generating areas;
 - u. Cleaning and material reuse areas; and,
 - v. Any other areas of industrial activity which may have potential pollutant sources.
3. The Storm Water Pollution Prevention Plan (SWPPP) must be prepared in accordance with Section X of this General Permit.
 4. A NOI Certification by the Discharger that all PRDs submitted are correct and true.
 5. SMARTS Electronic Authorization Form (Signed by any user authorized to certify and submit data electronically).

G. PRD Requirements for NEC Coverage

1. No Exposure Certification and Signed Electronic Authorization Form.
2. No Exposure Certification Checklist Consistent with Requirements in Section XVII.F.2 of this General Permit.
3. Current Site Map Consistent with Requirements in Section X.E of this General Permit.

H. Description of PRDs for NEC Coverage

1. The No Exposure Certification requires the following information:
 - a. Operator/Owner Information
 - Operator/Owner Name
 - Contact First Name
 - Contact Last Name
 - Title

PERMIT REGISTRATION DOCUMENTS (PRDS)

Street Address
 Address Line 2
 City/State/Zip
 Phone Ex (999-999-9999)
 E-mail (abc@xyz.com)
 Federal Tax ID

b. Facility Information

Facility Name
 Contact First Name
 Contact Last Name
 Title
 Street Address
 Address Line 2
 City
 County
 Phone Ex (999-999-9999)
 Emergency Phone Ex (999-999-9999)
 E-mail (abc@xyz.com)
 State/Zip CA
 Total Site Size (Acres)
 Latitude (Decimal degrees only, minimum 5 significant digits, Ex 99.99999)
 Longitude (Decimal degrees only, minimum 5 significant digits, Ex 99.99999)
 Percent of Site Imperviousness (%)
 Primary SIC Code
 Secondary SIC Code
 Tertiary SIC Code
 Regional Water Board

c. Billing Information

Billing Name (if different than Operator/Owner)
 Contact First Name
 Contact Last Name
 Title
 Street Address
 Address Line 2
 City/State/Zip
 Phone E.g. (999-999-9999)
 E-mail (e.g. abc@xyz.com)

d. SMARTS Electronic Authorization Form - Signed by any user authorized to certify and submit data electronically.

PERMIT REGISTRATION DOCUMENTS (PRDS)

- e. Certification by the Discharger that all PRDs submitted are correct and true and that the conditions of no-exposure have been met.
2. The NEC Checklist (Section XVII.F.2 of this General Permit) must be prepared to demonstrate that, based upon a facility inspection and evaluation, none of the following industrial materials or activities are, or will be in the foreseeable future, exposed to precipitation:
 - a. Activities such as using, storing, or cleaning industrial machinery or equipment, and areas with materials or residuals from these activities;
 - b. Materials or residuals on the ground or in storm water inlets from spills/leaks;
 - c. Materials or products from past industrial activity;
 - d. Material handling equipment (except adequately maintained vehicles);
 - e. Materials or products during loading/unloading or transporting activities;
 - f. Materials or products stored outdoors (except final products intended for outside use, e.g., new cars, where exposure to storm water does not result in the discharge of pollutants);
 - g. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
 - h. Materials or products handled/stored on roads or railways owned or maintained by the Discharger;
 - i. Waste material (except waste in covered, non-leaking containers, e.g., dumpsters). Application or disposal of processed wastewater (unless already covered by an NPDES permit); and,
 - j. Particulate matter or visible deposits of residuals from roof stacks/vents evident in the storm water outflow.
 3. The Site Map(s) shall include the following information (see Section X.E of this General Permit):
 - a. The facility boundary;
 - b. Storm water drainage areas within the facility boundary;
 - c. Portions of any drainage area impacted by discharges from surrounding areas and flow direction of each drainage area;

PERMIT REGISTRATION DOCUMENTS (PRDS)

- d. On-facility surface water bodies;
- e. Areas of soil erosion;
- f. Location(s) of nearby water bodies (such as rivers, lakes, wetlands, etc.);
- g. Location(s) of municipal storm drain inlets that may receive the facility's industrial storm water discharges and authorized NSWDs;
- h. Locations of storm water collection and conveyance systems and associated points of discharge, and direction of flow;
- i. Any structural control measures (that affect industrial storm water discharges, authorized NSWDs, and run-on);
- j. All impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures;
- k. Locations where materials are directly exposed to precipitation and the locations where significant spills or leaks identified (Section X.G.1.d of this General Permit) have occurred;
- l. Areas of industrial activity subject to this General Permit;
- m. All storage areas and storage tanks;
- n. Shipping and receiving areas;
- o. Fueling areas;
- p. Vehicle and equipment storage/maintenance areas;
- q. Material handling and processing areas;
- r. Waste treatment and disposal areas;
- s. Dust or particulate generating areas;
- t. Cleaning and material reuse areas; and,
- u. Any other areas of industrial activity which may have potential pollutant sources.

PERMIT REGISTRATION DOCUMENTS (PRDS)**I. Obtaining Coverage**

To obtain coverage under this General Permit PRDs must be included and completed. If any of the required items are missing, the PRD submittal is considered incomplete and will be rejected. Upon receipt of a complete PRD submittal, the State Water Board will process the application package in the order received and assign a (WDID) number.

J. Additional Information

The Water Board may require the submittal of additional information in SMARTS if required to determine the appropriate fee for the facility as specified by the fee regulations.

K. Questions

If you have any questions on completing the PRDs or about SMARTS, please email stormwater@waterboards.ca.gov or call (866) 563-3107.

ATTACHMENT E

LIST OF TOTAL MAXIMUM DAILY LOADS (TMDLS) APPLICABLE TO INDUSTRIAL STORM WATER DISCHARGERS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

The following table contains a list of Regional Water Board adopted and/or U.S. EPA established/approved TMDLs, as of the adoption date of this General Permit, that are applicable to industrial storm water Dischargers. TMDLs adopted/established after the effective date of the General Permit may, at the Water Boards discretion, be included in this General Permit. This General Permit may be reopened to amend TMDL-specific permit requirements in this Attachment E, or to incorporate new TMDLs adopted during the term of this General Permit that include requirements applicable to Dischargers covered by this General Permit.

Water Body	Pollutant
<u>San Francisco Bay Regional Water Quality Control Board</u>	
Napa River	Sediment
Sonoma Creek	Sediment
<u>Los Angeles Regional Water Quality Control Board</u>	
Santa Clara River Reach 3	Chloride
Santa Clara River	Nutrients
Los Angeles River	Metals
Los Angeles River	Nutrients
San Gabriel River	Metals and Selenium
Santa Monica Bay	Nearshore Debris
Machado Lake	Nutrient
Harbor Beaches of Ventura	Bacteria
Ballona Creek	Metals
Ballona Creek Estuary	Toxic Pollutants
Los Angeles Harbor	Bacteria
Marina del Rey Back Basins	Bacteria
Santa Clara River	Bacteria
Walker Creek,	Mercury
Oxnard Drain No. 3	Pesticides, PCBs ¹ and Sediment Toxicity
Long Beach City Beaches and Los Angeles River Estuary	Indicator Bacteria
Los Angeles and Long Beach Harbors	Toxic and Metals

¹ Polychlorinated biphenyls

**LIST OF TOTAL MAXIMUM DAILY LOADS (TMDLS) APPLICABLE TO
INDUSTRIAL STORM WATER DISCHARGERS**

Los Angeles Area Lakes	Nitrogen, Phosphorus, Mercury, Trash, Organochlorine Pesticides and PCBs
Santa Monica Bay	DDTs and PCBs
Machado Lake	Toxics
Colorado Lagoon	Pesticides, Polycyclic aromatic hydrocarbons, PCBs, and Metals
Calleguas Creek Watershed	Salts
Calleguas Creek Watershed	Metals and Selenium
Ballona Creek, Ballona Estuary, and Sepulveda Channel	Bacteria
Marina Del Rey Harbor-Back Basins	Copper, Lead, Zinc, and Chlordane, and Total PCBs
Los Cerritos Channel	Metals
<u>Santa Ana Regional Water Quality Control Board</u>	
San Diego Creek and Newport Bay	Toxic Pollutants
<u>San Diego Regional Water Quality Control Board</u>	
Chollas Creek	Diazinon
Chollas Creek	Copper, Lead, and Zinc
Los Peñasquitos Lagoon	Sediment
Rainbow Creek	Total Nitrogen and Total Phosphorus
Shelter Island Yacht Basin	Dissolved Copper
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in SD Bay	Indicator Bacteria
Twenty Beaches and Creeks	Indicator Bacteria

ATTACHMENT F

EFFLUENT LIMITATION GUIDELINES (ELGs)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITIES
(GENERAL PERMIT)

The following Parts of federal regulations at 40 Code of Federal Regulations Chapter I Subchapter N (Subchapter N) contain ELGs approved by US EPA for specific categories of industrial storm water discharges:

Point Source Category	ELGs ¹
Part 411 - Cement Manufacturing	 411.pdf
Part 418 - Fertilizer Manufacturing	 418.pdf
Part 419 - Petroleum Refining	 419.pdf
Part 422 - Phosphate Manufacturing	 422.pdf
Part 423 - Steam Electric Power Generating	 423.pdf

¹ The applicable ELGs are attached to this Attachment F. To view the attachments from an electronic (pdf) version of this Attachment F, left-click on the paper clip icon to the left of this pdf file to make the attachment window appear, then double-click on the icons of the attached pdf files. The attachments are also available on the Industrial Storm Water program pages of the State Water Resources Control Board's website (www.waterboards.ca.gov).

EFFLUENT LIMITATION GUIDELINES (ELGs)

Point Source Category	ELGs ²
Part 429 - Wetting of logs at wet deck storage areas	 429.pdf
Part 434 - Coal Mining	 434.pdf
Part 436 - Mineral Mining And Processing	 436.pdf
Part 440 - Ore Mining And Dressing	 440.pdf
Part 443 - Paving And Roofing Materials (Tars And Asphalt)	 443.pdf
Part 445 - Landfills	 445.pdf
Part 449 - Airport Deicing	 449.pdf

² The applicable ELGs are attached to this Attachment F. To view the attachments from an electronic (pdf) version of this Attachment F, left-click on the paper clip icon to the left of this pdf file to make the attachment window appear, then double-click on the icons of the attached pdf files. The attachments are also available on the Industrial Storm Water program pages of the State Water Resources Control Board's website (www.waterboards.ca.gov).

EFFLUENT LIMITATION GUIDELINES (ELGs)

New Source Performance Standards

New source performance standards (NSPS) represent the best available demonstrated control technology standards. US EPA has established NSPS guidelines for the industries found in the Table below. The intent of NSPS guidelines is to set effluent limitations that represent state-of-the-art treatment technology for new sources.³

Table 1 - Storm Water Specific NSPS Effluent Limitation Guidelines

Regulated Discharge	40 CFR Section	Multi Sector General Permit Sector	NSPS	Date New Source Data Established
Discharge resulting from spray down or intentional wetting of logs as wet deck storage areas	Part 429, Subpart I	A	Yes	1/26/81
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished products, by-products or waste products (SIC 2874)	Part 418, Subpart A	C	Yes	4/8/74
Runoff from asphalt emulsion facilities	Part 443, Subpart A	D	Yes	7/28/75
Runoff from materials storage piles at cement manufacturing facilities	Part 411, Subpart C	E	Yes	2/20/74
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, D	J	No	N/A
Runoff from hazardous waste and non-hazardous waste landfills	Part 445, Subparts A and B	K, L	Yes	2/2/00
Runoff from coal storage piles at steam electric generating facilities	Part 423	O	Yes	11/19/82 & 10/8/74
Discharges from primary airports with over 1,000 annual jet departures that conduct deicing operations.	Part 449, Subpart A	S	Yes	NA

³ New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced: (1) After promulgation of standards of performance under section 306 of CWA which are applicable to such source, or (2) After proposal of standards of performance in accordance with section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal as defined in 40 C.F.R section 122.26.

ATTACHMENT G

REQUIREMENTS FOR DISCHARGERS WHO HAVE BEEN GRANTED AN OCEAN PLAN EXCEPTION FOR DISCHARGES TO ASBS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

A. Areas of Special Biological Significance (ASBS)

1. ASBS are defined in the California Ocean Plan as “those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.”
2. The California Ocean Plan prohibits the discharge of waste to ASBS.
3. The California Ocean Plan authorizes the State Water Board to grant an exception to Ocean Plan provisions where the board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served.
4. On March 20, 2012, the State Water Board adopted Resolution 2012-0012 (amended by Resolution 2012-0031 on June 19, 2012) which contained a general exception to the California Ocean Plan for discharges of storm water and non-point sources (ASBS Exception). This resolution also contains the Special Protections that are to be implemented for direct discharges to ASBS. Resolution 2012-0012 is hereby incorporated by reference and its requirements must be complied with by industrial storm water Dischargers discharging directly to ASBS.
5. This General Permit requires Dischargers who have been granted an Ocean Plan exception for discharges to ASBS to comply with the requirements contained in the Special Protections. These requirements are contained below.

B. ASBS Non-Storm Water Discharges

1. The term “ASBS Non-Storm Water Discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not comprised entirely of storm water.
2. Only the following ASBS Non-Storm Water Discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

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- a. Discharges associated with emergency fire fighting operations.
 - b. Foundation and footing drains.
 - c. Water from crawl space or basement pumps.
 - d. Hillside dewatering.
 - e. Naturally occurring groundwater seepage via a storm drain.
 - f. Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.
3. Authorized ASBS Non- Storm Water Discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.
 4. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.
 5. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

C. ASBS Compliance Plan

1. State Water Board Resolution 2012-0012 grants an exception to the Ocean Plan's prohibition on discharges to ASBS (ASBS Exception) to applicants who were identified as Dischargers of industrial storm water to ASBS (ASBS Dischargers). Each ASBS Discharger shall specifically address the prohibition of ASBS Non-Storm Water Discharges and the requirement to maintain natural water quality for industrial storm water discharges to an ASBS in an ASBS Compliance Plan to be included in the ASBS Discharger's SWPPP. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board. The ASBS Compliance Plan shall include:

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- a. A map of surface drainage of storm water runoff, showing areas of sheet runoff and priority discharges, and a description of any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified as requiring installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.
- b. A description of the measures by which all unauthorized ASBS Non-Storm Water Discharges (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.
- c. A description of how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the Discharger can document to the satisfaction of the Executive Director that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:
 - 1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or
 - 2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline date for the reduction is March 20, 2012 (the effective date of the ASBS Exception), except for those structural BMPs installed between January 1, 2005 and the adoption of these special protections. The reductions must be achieved and documented by March 20, 2018.
- d. A description of how the ASBS Discharger will address erosion and the prevention of anthropogenic sedimentation in the ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.
- e. A description of the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an

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implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, ASBS Dischargers must first consider using LID practices to infiltrate, use, or evapotranspiration storm water runoff on-site. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

D. Reporting

If the results of the receiving water monitoring described in Section F. below (Sampling and Analysis Requirements) indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the ASBS Discharger shall submit a report to the State Water Board within 30 days of receiving the results.

1. The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.
2. The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWPPP for future implementation, and any additional BMPs that may be added to the SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.
3. Within 30 days of the approval of the report by the Executive Director, the ASBS Discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.
4. As long as the ASBS Discharger has complied with the procedures described above and is implementing the revised SWPPP, the Discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.
5. Compliance with this section does not excuse violations of any term, prohibition, or special condition contained in the Special Protections of the ASBS Exception.

E. Compliance Schedule

1. As of March 20, 2012, all unauthorized ASBS Non-Storm Water Discharges (e.g., dry weather flow) were effectively prohibited.
2. By September 20, 2013, the Discharger shall submit a draft written ASBS Compliance Plan to the Executive Director that describes its strategy to comply with these special conditions, including the requirement to maintain natural water

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quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the Discharger's SWPPP.

3. By September 20, 2014, the Discharger shall submit the final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring.
4. By September 20, 2013, any non-structural controls that are necessary to comply with these special conditions shall be implemented.
5. By March 20, 2018, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.
6. By March 20, 2018, all Dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the Discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See Flowchart at the end of this Attachment.
7. The Executive Director may only authorize additional time to comply with the special conditions 5 and 6, above if good cause exists to do so. Good cause means a physical impossibility or lack of funding

If a Discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the Discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in 5. or 6. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of these requirements. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the Discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The Discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The Discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

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- a. for municipalities, a demonstration of significant hardship to Discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the Discharger's jurisdictional area, and the Discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
- b. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

F. Additional Requirements – Waterfront and Marine Operations

In addition to the above provisions, a Discharger with waterfront and marine operations shall comply with the following:

1. For discharges related to waterfront and marine operations, the Discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.
 - a. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.
 - b. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.
 - c. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.
 - d. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are

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- adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.
- e. The Discharger shall submit its Waterfront Plan to the State Water Board Executive Director by September 20, 2012. The Waterfront Plan is subject to approval by the State Water Board Executive Director. The plan must be fully implemented within by September 20, 2013.
2. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.
 3. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.
 4. If the Discharger anticipates that the Discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the Discharger shall submit a technical report as soon as practicable to the Executive Director. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.
 5. The State Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a Discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the Discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section F.1.e above. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Attachment. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the Discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The Discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The Discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

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- a. a demonstration of significant hardship by showing that the Discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.
- b. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

G. Sampling and Analysis Requirements

1. Monitoring is mandatory for all ASBS Dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (1) Core Discharge Monitoring and (2) Ocean Receiving Water Monitoring (see Sections H. and I. below). The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).
2. Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notifying the Executive Director that hazardous conditions prevail.
3. Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

H. Core Discharge Monitoring Program

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples as described in Section I. below.

2. Runoff flow measurements

- a. For industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be

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- measured or calculated, using a method acceptable to and approved by the Executive Director.
- b. This will be reported annually for each precipitation season to the Executive Director.
3. Runoff samples – storm events
 - a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:
 - 1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, if within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination; and 2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.
 - b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:
 - 1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, if within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination; and
 - 2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals (provided at the end of this Attachment) for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and
 - 3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.
 - 4) if an ASBS Discharger has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals (provided at the end of this Attachment) for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).
 - c. For an applicant not participating in a regional integrated monitoring program [see below in Section I.3.] in addition to the sampling requirements in Section H.3.a. and b. above, a minimum of the two largest outfalls or 20 percent of the

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- larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents (Table A and B constituents are provided at the end of this Attachment) for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.
- d. The Executive Director may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

I. Ocean Receiving Water and Reference Area Monitoring Program

1. In addition to performing the Core Discharge Monitoring Program in Section H. above, all ASBS Dischargers must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, ASBS Dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.
2. Individual Monitoring Program: The requirements listed below are for those ASBS Dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:
 - a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in Section H.3. above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents (Table A and B constituents are provided at the end of this Attachment) for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm), and during (or immediately after) the same storm (post-storm). Post-storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be

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- sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).
- b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents (provided at the end of this Attachment) for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.
 - c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.
 - d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.
 - e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the ASBS Discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.
 - f. The monitoring requirements of the Individual Monitoring Program in this Section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point

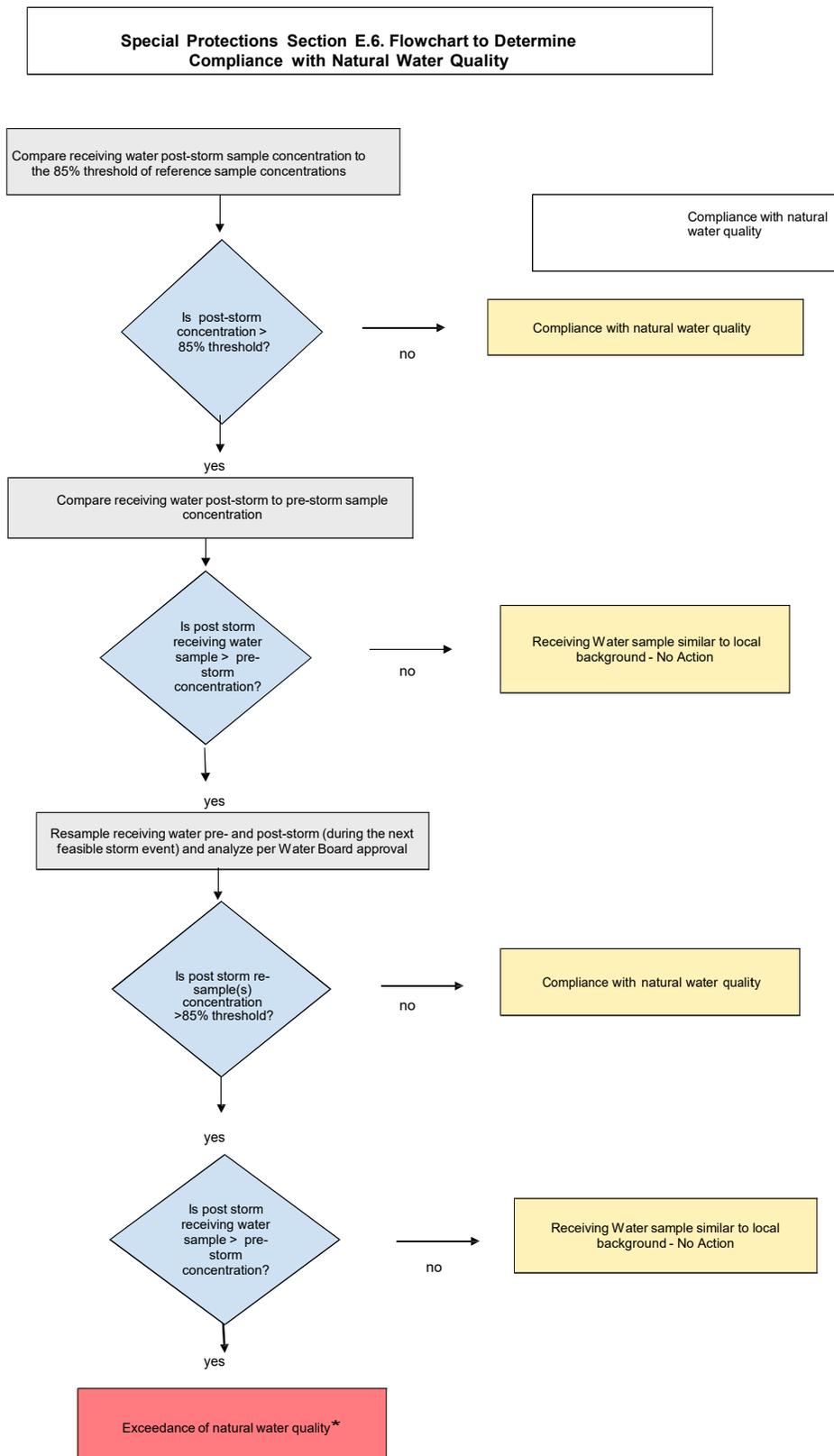
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- after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.
3. Regional Integrated Monitoring Program: ASBS Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section I.2.) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.
 - a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional integrated monitoring program, the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.
 - b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than 18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate

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- storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.
- c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS Dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.
 - d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals (provided at the end of this Attachment) for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

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* When an exceedance of natural water quality occurs, the Discharger must comply with Section D. Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.

ASBS Monitoring

TABLE A
Monitoring Constituent List
(excerpted from California Ocean Plan dated 2009)

Constituent	Units
Grease and Oil	mg/L
Suspended Solids	Mg/L
Settleable Solids	mL/L
Turbidity	NTU
PH	

TABLE B
Monitoring Constituent List
(Excerpted from California Ocean Plan dated 2009)

Constituent	Units
Arsenic	µg/L
Cadmium	µg/L
Chromium	µg/L
Copper	µg/L
Lead	µg/L
Mercury	µg/L
Nickel	µg/L
Selenium	µg/L
Silver	µg/L
Zinc	µg/L
Cyanide	µg/L
Total Chlorine Residual	µg/L
Ammonia (as N)	µg/L
Acute Toxicity	TUa
Chronic Toxicity	TUc
Phenolic Compounds (non-chlorinated)	µg/L
Chlorinated Phenolics	µg/L
Endosulfan	µg/L
Endrin	µg/L
HCH	µg/L

Analytical Chemistry Methods: All constituents shall be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, shall be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

ATTACHMENT H

SAMPLE COLLECTION AND HANDLING INSTRUCTIONS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITIES
(GENERAL PERMIT)

For more detailed guidance, Dischargers should refer to the U.S. EPA's "Industrial Stormwater Monitoring and Sampling Guide," dated March 2009, available at: http://www.epa.gov/npdes/pubs/msgp_monitoring_guide.pdf and the "NPDES Storm Water Sampling Guidance Document," dated July 1992, available at: <http://www.epa.gov/npdes/pubs/owm0093.pdf>.

1. Identify the sampling parameters required to be tested and the number of storm water discharge points that will be sampled. Request the analytical testing laboratory to provide the appropriate number and type of sample containers, sample container labels, blank chain of custody forms, and sample preservation instructions.
2. Determine how samples will be transported to the laboratory. The testing laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory). The Discharger may either deliver the samples to the laboratory, arrange for the laboratory to pick up the samples, or overnight ship the samples to the laboratory. All sample analysis shall be done in accordance with 40 Code of Federal Regulations part 136. Samples for pH have a holding time of 15 minutes.¹
3. Qualified Combined Samples shall be combined by the laboratory and not by the Discharger. Sample bottles must be appropriately labeled to instruct the laboratory on which samples to combine.
4. Unless the Discharger can provide flow weighted information, all combined samples shall be volume weighted.
5. For grab samples, use only the sample containers provided by the laboratory to collect and store samples. Use of any other type of containers may contaminate samples.
6. For automatic samplers that are not compatible with bottles provided by the laboratory, the Discharger is required to send the sample container included with the automatic sampler to the laboratory for analysis.

¹ 40 C.F.R. section 136.3, Table II - Required Containers, Preservation Techniques, and Holding Times.

SAMPLE COLLECTION AND HANDLING INSTRUCTIONS

7. The Discharger can only use automatic sampling device to sample parameters that the device is designed to. For pH, Dischargers can only use automatic sampling devices with the ability to read pH within 15 minutes of sample collection.
8. The Discharger is prohibited from using an automatic sampling device for Oil and Grease, unless the automatic sampling device is specifically designed to sample for Oil and Grease.
9. To prevent contamination, do not touch inside of sample container or cap or put anything into the sample containers before collecting storm water samples.
10. Do not overfill sample containers. Overfilling can change the analytical results.
11. Tightly screw on the cap of each sample container without stripping the threads of the cap.
12. Complete and attach a label for each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.
13. Carefully pack sample containers into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment. Remember to place frozen ice packs into shipping containers. Samples should be kept as close to 4 degrees Celsius (39 degrees Fahrenheit) as possible until arriving to the laboratory. Do not freeze samples.
14. Complete a Chain of Custody form for each set of samples. The Chain of Custody form shall include the Discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container.
15. Upon shipping/delivering the sample containers, obtain both the signatures of the persons relinquishing and receiving the sample containers.
16. Dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the sample protocols and laboratory practices.
17. Refer to Table 1 in the General Permit for test methods, detection limits, and reporting units.
18. All sampling and sample preservation shall be in accordance with 40 Code of Federal Regulations part 136 and the current edition of "Standard Methods for

SAMPLE COLLECTION AND HANDLING INSTRUCTIONS

the Examination of Water and Wastewater” (American Public Health Association). All monitoring instruments and equipment (including Discharger field instruments for measuring pH or specific conductance if identified as an additional sampling parameter) shall be calibrated and maintained in accordance with manufacturers’ specifications to ensure accurate measurements. All laboratory analyses shall be conducted according to approved test procedures under 40 Code of Federal Regulations part 136, unless other test procedures have been specified by the Regional Water Quality Control Board. All metals shall be reported as total metals. Dischargers may conduct their own field analysis of pH (or specific conductance if identified as an additional sampling parameter) if the Discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis. With the exception of field analysis conducted by Dischargers for pH (or specific conductance if identified as an additional sampling parameter), all analyses shall be sent to and conducted at a laboratory certified for such analyses by the California Department of Public Health. Dischargers are required to report to the Water Board any sampling data collected more frequently than required in this General Permit (Section XXI.J.2)

APPENDIX 1

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITIES
(GENERAL PERMIT)

FACILITY NAME: _____

Waste Discharge Identification (WDID) #: _____

	FACILITY CONTACT	Consultant/Qualified Industrial Storm Water Practitioner (QISP)
Name		
Title		
Company		
Street Address		
City, State		
Zip		

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Signed Certification (Section II.A)			
Pollution Prevention Team (Section X.D.1)			
Existing Facility Plans (Section X.D.2)			
Site Map(s) (Section X.E)			
Facility boundaries (Section X.E.3.a)			
Drainage areas (Section X.E.3.a)			
Direction of flow (Section X.E.3.a)			
On-facility water bodies (Section X.E.3.a)			

**STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
CHECKLIST**

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Areas of soil erosion (Section X.E.3.a)			
Nearby water bodies (Section X.E.3.a)			
Municipal storm drain inlets (Section X.E.3.a)			
Points of discharge (Section X.E.3.b)			
Sampling Locations (Section X.E.3.b)			
Structural control measures (Section X.E.3.c)			
Impervious areas (Section X.E.3.d)			
Location of Directly Exposed Materials (Section X.E.3.e)			
Locations of significant spills and leaks (Section X.E.3.e)			
Areas of Industrial Activity (Section X.E.3.f)			
Areas of industrial activity (Section X.E.3.f)			
Storage areas/storage tanks (Section X.E.3.f)			
Shipping and receiving areas (Section X.E.3.f)			
Fueling areas (Section X.E.3.f)			
Vehicle and equipment storage/maintenance (Section X.E.3.f)			
Material handling/processing (Section X.E.3.f)			
Waste treatment/disposal (Section X.E.3.f)			
Dust or particulate generation (Section X.E.3.f)			
Cleaning and material reuse (Section X.E.3.f)			

**STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
CHECKLIST**

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Other areas of industrial activities (Section X.E.3.f)			
List of Industrial Materials (Section X.F)			
Storage location			
Quantity			
Frequency			
Receiving and shipping location			
Quantity			
Frequency			
Handling location			
Quantity			
Frequency			
Potential Pollution Sources (Section X.G)			
Description of Potential Pollution Sources (Section X.G.1)			
Industrial processes (Section X.G.1.a)			
Material handling and storage areas (Section X.G.1.b)			
Dust & particulate generating activities (Section X.G.1.c)			
Significant spills and leaks (Section X.G.1.d)			
Non-storm water discharges (Section X.G.1.e)			
Erodible surfaces (Section X.G.1.f)			
Assessment of Potential Pollutant Sources (Section X.G.2)			
Narrative assessment of likely sources of pollutants (Section X.G.2.a)			
Narrative assessment of likely pollutants present in storm water discharges (Section X.G.2.a)			
Identification of additional BMPs Section X.G.2.b)			

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CHECKLIST

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Identification of drainage areas with no exposure (Section X.G.2.c)			
Identification of additional parameters (Section X.G.2.d)			
Storm Water Best Management Practices (Section X.H)			
Minimum BMPs (Section X.H.1)			
Good housekeeping (Section X.H.1.a)			
Preventative maintenance (Section X.H.1.b)			
Spill response (Section X.H.1.c)			
Material handling and waste management (Section X.H.1.d)			
Erosion and sediment controls (Section X.H.1.e)			
Employee training program (Section X.H.1.f)			
Quality assurance and record keeping (Section X.H.1.g)			
Advanced BMPs (Section X.H.2)			
Implement advanced BMPs at the facility (Section X.H.2.a)			
Exposure Minimization BMPs (Section X.H.2.b.i)			
Storm Water containment and discharge reduction BMPS (Section X.H.2.b.ii)			
Treatment Control BMPs (Section X.H.2.b.iii)			
Other advance BMPs (Section X.H.2.b.iv)			
Temporary Suspension of Activities (Section X.H.3)			
BMPs necessary for stabilization of the facility (Section X.H.3)			

**STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
CHECKLIST**

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
BMP Descriptions (Section X.H.4)			
Pollutant that a BMP reduces or prevents (Section X.H.4.a.i)			
Frequency of BMP implementation (Section X.H.4.a.ii)			
Location of BMP (Section X.H.4.a.iii)			
Person implementing BMP (Section X.H.4.a.iv)			
Procedures/maintenance/ instructions for BMP implementation (Section X.H.4.a.v)			
Equipment and tools for BMP implementation (Section X.H.4.a.vi)			
BMPs needing more frequent inspections (Section X.H.4.a.vii)			
Minimum BMP/applicable advanced BMPs not implemented at the facility (Section X.H.4.b)			
BMPs implemented in lieu of minimum or applicable advanced BMPs (Section X.H.4.c)			
BMP Summary Table (Section X.H.5)			
Monitoring Implementation Plan (Section X.I)			
Team members assisting in developing the MIP (Section X.I.1)			
Summary of visual observation procedures, locations, and details (Section X.I.2)			
Justifications if applicable for: Alternative discharge locations, Representative Sampling Reduction or, Qualified Combined Samples (Section X.I.3)			
Procedures for field instrument calibration (Section X.I.4)			

**STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
CHECKLIST**

SWPPP (General Permit Section)	Not Applicable	SWPPP Page # or Reference Location	Date Implemented or Last Revised
Example of Chain of Custody (Section X.I.5)			
Annual Comprehensive Facility Compliance Evaluation (Section XV)			
Review of all visual inspection and monitoring records and sampling and analysis results conducted during the previous reporting year (Section XV.A)			
Visual inspection of all areas of industrial activity and associated potential pollutant sources (Section XV.B)			
Visual inspection of all drainage areas previously identified as having no-exposure to industrial activities and materials in accordance with the definitions in Section XVII (Section XV.C)			
Visual inspection of equipment needed to implement the BMPs (Section XV.D)			
Visual inspection of any structural and/or treatment control BMPs (Section XV.E)			
Review and assessment of all BMPs for each area of industrial activity and associated potential pollutant sources (Section XV.F)			
Assessment of other factors needed to complete the information described in Section XVI.B (Section XV.G)			

APPENDIX 2

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

This Attachment provides general guidance instructions and guidance for obtaining NEC coverage. The actual NEC requirements are primarily contained in Section XVII of this General Permit.

A. INSTRUCTIONS:

Who May File for NEC Coverage

Sections 301 and 402(p) of the Clean Water Act (CWA), and Sections 1311 and 1342(p) of 33 United States Code prohibit the discharge of storm water associated with industrial activity to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit. However, NPDES permit coverage is “conditionally excluded” for discharges of storm water associated with industrial activities (industrial storm water discharges) if the Discharger can certify that a condition of “No Exposure” exists at the industrial facility. A condition of “No Exposure” means that a Discharger’s industrial activities and materials are not exposed to storm water. Industrial storm water discharges from construction and land disturbance activities are ineligible for the NEC coverage. Dischargers who file valid NECs in accordance with these instructions are not required to implement Best Available Technology Economically Achievable /Best Conventional Pollutant Control Technology and comply with the Storm Water Pollution Prevention Plan (SWPPP) and monitoring requirements of this General Permit.

Obtaining and Maintaining NEC Coverage

A Discharger must electronically certify and submit NEC Permit Registration Documents (PRDs) via State Water Resources Control Board’s (State Water Board’s) Storm Water Multi-Application and Report Tracking System (SMARTS) to obtain NEC coverage. This conditional exclusion does not become effective until the PRDs are submitted and the annual fee is paid. Upon receipt of the annual fee, the Discharger will electronically receive an NEC acceptance notification via SMARTS, which will include a Waste Discharge Identification (WDID) number. A Discharger must maintain a condition of “No Exposure” at the facility for the conditional exclusion to remain applicable. The Discharger must annually electronically re-certify the NEC via SMARTS to confirm that the conditions of “no exposure” are being maintained. If conditions change resulting in the exposure of materials and activities to storm water, the Discharger must electronically certify and submit PRDs via SMARTS for Notice of Intent (NOI) coverage under the General Permit for Storm Water Discharges Associated with Industrial Activities (General Permit).

Fees

First time NEC coverage PRDs and the annual re-certification require a fee. Fees may be changed by State Water Board regulation, independent of this General Permit.

How to Prepare and Submit PRDs for NEC Coverage

A Discharger must electronically certify and submit PRDs for NEC coverage in accordance with the instructions provided at the State Water Board web site for SMARTS:

<https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp>

A Discharger with multiple facilities that satisfy the conditions of “No Exposure” must certify and submit PRDs for each facility. The Discharger is required to inspect and evaluate each individual facility to determine the condition of No-Exposure. The Discharger must retain an electronic or paper copy of the NEC coverage acceptance notification for their records.

The following information is required in the PRDs:

Discharger Information

1. The legal business name of the business entity, public organization, or any other entity that operates the facility described in the certification. The name of the operator may or may not be the same as the name of the facility. The operator is the legal entity that controls the facility operations, not the plant or site manager.
2. The mailing address of the facility operator, including the city, state, and zip code.
3. The facility operator contact person, telephone number and e-mail address.

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

Facility Information

4. The legal business name of the facility.
5. The total acreage of the facility associated with industrial activity. (Facility size in acres is calculated by taking the square feet and dividing by 43,560.)
6. The complete physical street address (e.g. the street address used for express deliveries), including the city, State, and zip code. Do not use a P.O. Box number. If a physical street address does not exist, describe the location or provide the latitude and longitude of a point within the facility boundary. Latitude and longitude are available from United States Geological Survey quadrangle or topographic maps, or may be found using a mapping site on the internet.
7. The facility contact person, telephone number, and e-mail address.
8. The 4-digit Standard Industrial Classification (SIC) code that represents the facility primary industrial activity. Provide a brief description of the primary industrial activity. If applicable, enter other significant SIC codes and descriptions. To obtain these codes, see the 1987 SIC Manual or the Occupational Health and Safety Administration's site:

<http://www.osha.gov/pls/imis/sicsearch.html>
9. If the facility is currently covered under the General Permit, include the WDID number. The WDID number will be used at a later date to terminate the facility's coverage under the General Permit as necessary.

Facility Mailing or Billing Address

Completion of this item is required the facility mailing address or billing address differs from the physical facility address provided above. The Discharger must indicate which address the annual fee invoice must be sent to if the State Water Board is unable to transmit the invoice electronically.

Site Maps

Site maps must be prepared and submitted in accordance with the requirements in Section X.E of this General Permit.

NEC Checklist

The Discharger must evaluate the eleven major areas that storm water exposure may occur, per the listing at the end of this appendix. The Discharger must be able to certify

that none of these major areas have potential for exposure. If the Discharger cannot certify that every one of the eleven major areas do not have exposure, a potential for exposure exists at the facility and the facility is not eligible for NEC coverage. The Discharger must obtain (or continue) NOI coverage under this General Permit if the facility is not eligible for NEC coverage. After obtaining NOI coverage, the Discharger may implement facility modifications to eliminate the potential for a discharge of storm water exposed to industrial activity, and then change their NOI coverage to NEC coverage by certifying the conditions of "No Exposure" are met.

Certification

Federal and state statutes provide for severe penalties for Dischargers that submit false information on the PRDs. Dischargers shall certify and submit PRDs via SMARTS for NEC coverage in accordance with Electronic Signature and Certification Requirements in Section XXI.K of this General Permit.

B. GUIDANCE:

Contact your local Regional Water Quality Control Board (Regional Water Board) office with questions regarding this guidance.

1. Who is Eligible to Qualify for the No Exposure Certification (NEC) - Conditional Exclusion?

All industrial categories listed in Attachment A of this General Permit (excluding construction) are eligible to apply for the NEC coverage.

2. Limitations on Eligibility for NEC coverage

In addition to construction projects not being eligible, the following situations limit the applicability of NEC coverage:

- a. NEC coverage is available on a facility-wide basis only, not for individual drainage areas or discharge locations. Generally, if any exposed industrial materials or activities exist, or have a potential to exist, anywhere at a facility, NEC coverage is not applicable to the facility. If the Regional Water Board determines that a facility does have exposure or the facility's storm water discharges have a reasonable potential to cause or contribute to an exceedance of applicable water quality objectives/standards, the Regional Water Board can deny NEC coverage.
- b. If changes at a facility result in potential exposure of industrial activities or materials, the facility is no longer eligible for NEC coverage. Dischargers

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

shall register for NOI coverage under this General Permit prior to a planned facility change that will cause exposure, or within seven (7) calendar days after unplanned exposure occurs. If an unplanned exposure occurs due to an emergency response or one-time event that is unlikely to re-occur, a Discharger may contact the Regional Water Board to discuss whether the requirement to obtain NOI coverage can be waived. Unless the Discharger receives a written waiver from the Regional Water Board, the Discharger shall electronically certify and submit PRDs to obtain NOI coverage.

- c. Current contamination resulting from historic industrial practices at the facility (e.g., soil contamination, groundwater contamination, etc.) represents a condition of exposure to waters of the United State; therefore a facility with historic contamination is not eligible for NEC coverage.

3. What is the Definition of No Exposure?

- a. No Exposure means all industrial materials and activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt and/or runoff.
- b. Industrial materials and activities include, but are not limited to, material-handling equipment or activities; industrial machinery; raw materials, intermediate products, by-products, and final products; or waste products.
- c. Material handling activities include storage, loading and unloading, transport, or conveyance of any raw material, intermediate product, by-product, final product, or waste product.
- d. Final products intended to be used outdoors (e.g., automobiles) typically pose little risk of polluting storm water since not typically contaminated with pollutants that become mobilized by contact with storm water. Final products are exempt from the requirement for protection by a storm-resistant shelter to qualify for no exposure. Similarly, containers, racks, and other transport platforms (e.g., wooden pallets) used for the storage or conveyance of final products may also be stored outside if pollutant-free or pollutants do not mobilize via contact with storm water.
- e. Storm-resistant shelters include: (1) completely roofed and walled buildings or structures, (2) structures with only a top cover (no side coverings) supported by permanent supports, provided material within the structure is not subject to wind dispersion (sawdust, powders, etc.) or being

tracked out of the facility, and is not a source of pollutants in the industrial storm water discharges.

4. Industrial Materials/Activities Not Requiring a Storm-Resistant Shelter

The intent of the “No Exposure” exclusion is to maintain a condition of permanent “No Exposure”. A storm-resistant shelter is not required for the following industrial materials and activities:

- a. Drums, Barrels, Tanks, and Similar Containers that are sealed (“sealed” means banded or otherwise secured and without operational taps or valves), are not exposed provided those containers are not deteriorated, do not contain residual materials on the outside surfaces, and do not leak. Drums, barrels, etc., that are not opened while outdoors, or are not deteriorated or leaking, and that do not pose a risk of contaminating storm water runoff. Consider the following when making a “No Exposure” determination:
 - i. Materials shall not be added or withdrawn to/from containers while outdoors
 - ii. Simply moving containers while outside does not create exposure unless exposure occurs when pollutants are “tracked out” by the container handling equipment or vehicles.
 - iii. All outdoor containers shall be inspected to ensure they are not open, deteriorated, or leaking. When an outdoor container is observed as opened, deteriorated, or leaking, the container must immediately be closed, replaced, or sheltered. Frequent detection of open, deteriorated, or leaking containers, or failure to immediately close, replace, or shelter opened, deteriorated or leaking containers will cause a condition of exposure.
 - iv. Containers, racks, and other transport platforms (e.g., wooden pallets) used with drums, barrels, etc., can be stored outside providing they are contaminant-free and in good repair.
- b. Above Ground Storage Tanks (ASTs) In addition to generally being considered as not exposed, ASTs may also be exempt from the prohibition against adding or withdrawing material to/from external containers. ASTs typically use transfer valves to dispense materials that support facility operations (e.g., heating oil, propane, butane, chemical feedstock) or fuel for delivery vehicles (gasoline, diesel, compressed natural gas). For operational

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

ASTs to qualify for “No Exposure”, the following must be satisfied:

- i. The tank(s) shall be physically separated from and not associated with vehicle maintenance operations.
 - ii. There shall be no leaks from piping, pumps, or other equipment that has the potential to come in contact with storm water.
 - iii. Wherever feasible, the tank(s) shall have secondary containment (e.g., an impervious dike, berm or concrete retaining structure) to prevent runoff in the event of a structural failure or leaking transfer valve. Note: any resulting unpermitted discharge is in violation of the CWA.
- c. Lidded Dumpsters. Lidded dumpsters containing waste materials, providing the containers are completely covered and nothing can drain out holes in the bottom, spilled when loaded into the dumpster, or spilled in loading into a garbage truck. Industrial waste materials and trash that is stored uncovered is considered exposed.
- d. Adequately maintained vehicles, such as trucks, automobiles, forklifts, trailers or other general-purpose vehicles found onsite - but not industrial machinery that are not leaking, are in good repair or are not otherwise a potential source of contaminants:
- i. Vehicles passing between buildings may be exposed to storm water, however if the vehicles are adequately maintained, a condition of exposure may not exist. Similarly, non-leaking vehicles awaiting maintenance at vehicle maintenance facilities are not considered as potential exposure. However, vehicles that have been washed or rinsed that are not completely dry prior to outside exposure have the potential to cause a condition of exposure. Vehicles that track materials out of the facility are considered to be mobilizing pollutants. Vehicles that exit maintenance bays are also considered to cause exposure.
 - ii. The mere conveyance between buildings of materials / products that are otherwise not allowed to be stored outdoors, does not create a condition of exposure, provided the materials/products are adequately protected from storm water and do not have the potential to be released as a result of a leak or spill.
- e. Final products built and intended for use outdoors (e.g., new cars), provided the final products have not deteriorated, are not contaminated, or are not otherwise potential sources of contaminants.
- Types of final products not qualifying for a certification of “No Exposure”:
- i. Products that may be mobilized in storm water discharges (e.g., rock salt).
 - ii. Products, which may, when exposed, oxidize, deteriorate, leak, or otherwise be a potential source of contaminants (e.g., junk cars, stockpiled train rails).
 - iii. “Final” products that are, in actuality, “intermediate” products. Intermediate products are those used in the composition of yet another product (i.e., sheet metal, tubing, and paint used in making tractors).
 - iv. Even if the intermediate product is “final” for a manufacturer and destined for incorporation in a “final product intended for use outdoors,” the product is not allowed to be exposed because they may be chemically treated or are insufficiently impervious to weathering.
- f. Special Conditions for Construction Activities
Permanent, uninterrupted sheltering of industrial activities or materials may not always be possible during facility renovation or construction. When such circumstances exist, the Discharger is not required to obtain coverage under an NPDES permit as long as the following conditions are met:
- i. Materials and activities are protected with temporary covers or shelters (i.e. tarpaulins);
 - ii. Temporary covers or shelters prevent the contact of storm water to materials and activities;
 - iii. Materials are subject to wind dispersion are not stored under temporary sheltering;
 - iv. Temporary shelters are only used when necessary during facility renovation or construction and until permanent storm-resistant shelters as described above are available; and,
 - v. Temporary shelters are only used for a single period of ninety days or less. (Facilities with construction and renovation projects that will need the use of temporary shelters beyond 90 days, or that will require multiple periods of ninety

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

days or less, are required to be covered by an NPDES permit.)

5. Other Potential Sources of Contaminants

- a. Particulate Emissions from Roof Stacks and/or Vents: Deposits of particles or residuals from roof stacks/vents that have the potential to be mobilized by storm water runoff are considered exposed.
- b. Pollutants Potentially Mobilized by Wind Windblown materials cause a condition of exposure. Materials sheltered from precipitation are be deemed exposed if the materials has a potential to be mobilized by wind.

6. Certifying a Condition of “No Exposure”

To obtain the NEC coverage, the Discharger must electronically certify and submit PRDs via SMARTS that the facility meets the definition of “No Exposure” and pay an annual fee. The Discharger must **submit PRDs for NEC coverage even if the Discharger was not previously required to file for NEC coverage under the previous General Permit**. These PRDs include a checklist requiring the Discharger to evaluate eleven major areas to determine whether there is exposure of industrial activities and materials at the facility. To qualify for NEC coverage the Discharger must satisfy all the NEC coverage conditions in this General Permit and certify that there is “No Exposure”. The checklist: 1) aids the Discharger in determining if its facility is eligible for NEC coverage, and 2) furnishes the necessary documentation supporting relief from the General Permit’s requirement of NOI coverage. Additionally, Dischargers with NEC coverage are not required to develop and implement SWPPPs or comply with the monitoring requirements.

If a Discharger cannot certify that there is “No Exposure” at the facility, the Discharger must make appropriate changes at the facility to eliminate exposure prior to registering for future NEC coverage. Facility changes must remove all potential for pollutant exposure to storm water.

An annual inspection and evaluation, re-certification and fee are required thereafter.

7. Other NEC coverage Facts:

- a. NEC coverage is only valid if the condition of “No Exposure” exists and is reasonably expected to continue to exist. Dischargers shall electronically certify and submit PRDs for NOI coverage when the condition of “No Exposure” is no longer expected to exist.
- b. Dischargers must file PRDs for NEC coverage for each qualifying facility.
- c. An NEC must be submitted for each separate facility qualifying for the “No Exposure” conditional exclusion.
- d. An NEC is non-transferable. If a new operator takes over facility operations, the new operator shall electronically certify and submit PRDs and applicable fees for new NEC coverage via SMARTS prior to the operations transfer. NEC coverage cannot be transferred from one physical location to another regardless of ownership.

8. Operators May Be Required to Obtain NOI Coverage Based on the Protection Of Water Quality?

Operators who certified that their facilities qualify for NEC coverage may, nonetheless, be required by the Regional Water Board to obtain NOI coverage if the Regional Water Board determines that the facility’s discharge has the potential to cause or contribute to an exceedance of applicable water quality objectives/standards or determines that exposure exists at the facility. The Regional Water Board may request information and/or inspect the facility to assess potential water quality impacts and to determine if NOI coverage is required. The Discharger shall take appropriate actions to ensure compliance with the General Permit.

9. Steps to Obtain NEC coverage

This section will walk you through the process of obtaining NEC coverage.

Step 1: Determine if your facility is subject to this General Permit (refer to Attachment A of this General Permit). If yes, proceed to Step 2. If not, stop here.

If your facility is included in Attachment A and conducts industrial activities, you are required to **either** register for NOI coverage or NEC coverage.

Step 2: Determine if your regulated industrial activity meets the definition of “No Exposure” and qualifies for the exclusion from permitting. If yes, proceed to Step 3. If no, stop here and obtain NOI coverage. An

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

evaluation of the facility must be conducted by facility personnel familiar with the facility and its operations. Inspect all facility areas and potential pollutant sources to determine whether the facility satisfies the “No Exposure” conditions.

Step 3: Electronically certify and submit the PRDs for NEC coverage via SMARTS and mail the annual fee to the State Water Board at the following address:

SWRCB
Surface Water Permitting Section
PO Box 1977
Sacramento, CA 95812-1977

To maintain NEC coverage, the NEC must re-certify and pay a fee annually. This may only be done if the condition of “No Exposure” continues to exist at the facility.

Step 4: If requested, staff from the Water Boards, local Municipal Separate Storm Sewer System (MS4), or United States Environmental Protection Agency must be allowed to inspect your facility. All inspection reports will be made publicly available.

Step 5: Maintain a condition of “No Exposure”.

- NEC coverage is not a blanket exemption. Therefore, if facility physical or operational changes occur which cause exposure of industrial activities or materials to storm water, the Discharger must then immediately comply with all the requirements of this General Permit, including obtaining NOI coverage as applicable.
- To maintain the condition of “No Exposure”, the Discharger shall annually evaluate the facility to assure that the conditions of “No Exposure” still exist. More frequent evaluations may be necessary in circumstances when facility operations are rapidly changing.
- Failure to maintain the condition of “No Exposure” or otherwise obtain NOI coverage may lead to the unauthorized discharge of storm water associated with industrial activity to waters of the United States, resulting in penalties under the CWA and Water Code.

C. Frequently Asked Questions:

Q1. Who is eligible for NEC Coverage?

- A. Any Discharger operating a facility described in Attachment A may register for NEC coverage if their facility has a condition of “No Exposure”.

Q2. How does an eligible Discharger file for NEC coverage and where is the annual fee sent?

- A. The PRDs for NEC coverage shall be electronically certified and submitted in accordance with the instructions provided in SMARTS at the State Water Board website at: <https://smarts.waterboards.ca.gov/smarts/faces/SwSmaRtsLogin.jsp>. The fee is currently \$242, but may be changed by regulation. Once NEC coverage is accepted, an invoice will be electronically sent to the Discharger. The annual fee and invoice shall be sent to:
- State Water Resources Control Board
Division of Water Quality
Attention: Industrial Storm Water Unit
P.O. Box 1977
Sacramento, CA 95812-1977

Q3. If my facility’s storm water discharges are covered by an individual permit, can I file for NEC coverage?

- A. Yes. Storm water discharges covered by an individual permit are eligible for NEC coverage if the conditions at the facility satisfy the definition of “No Exposure” and you obtain approval to terminate individual permit coverage from the local Regional Water Board prior to PRD submittal. Approval from the Regional Water Board is mandatory. Many individual permits, for example, contain numeric storm water effluent limitations (“antibacksliding” provisions may prevent these facilities from qualifying for the “No Exposure” conditional exclusion).

Q4. My facility was originally excluded from the Phase I regulations because it was classified as a “light industrial facility”. The facility has never had any exposure to storm water runoff. Do I now need to certify that the facility meets the No Exposure Exclusion from NPDES Storm Water Permitting?

- A. Yes. See answer provided to question number 9, “What is the exclusion “conditional” upon?”

Q5. Do I have to file a Notice of Termination (NOT) and a register for NEC coverage if my facility has NOI coverage and qualifies for NEC coverage?

- A. No. You are only required to register for NEC coverage. You must provide the WDID# in your NEC coverage PRDs in order for the State Water Board to change permit coverage status.

Q6. When and how often is a NEC coverage re-certification required?

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

- A.** Re-certification of NEC coverage is required annually (assuming the facility maintains its “No Exposure” status). The State Water Board will electronically transmit an NEC re-certification and annual fee notification to each facility operator who has filed for NEC coverage.

public documents and will be available for public review via SMARTS.

Q10. Can secondary containment around an outdoor exposed area qualify for a condition of “No Exposure”?

- A.** If secondary containment is engineered to always prevent a discharge of collected rainfall (based on the historical rainfall record) and a simultaneous spill of any other industrial materials or liquids, the “No Exposure” condition may be claimed. Note that there must be proper disposal of any water or liquids collected from the containment (i.e., discharged in compliance with another NPDES permit, treated and discharged to the sanitary sewer, or trucked offsite to an appropriate disposal/treatment facility).

D. NEC Checklist

An NEC Checklist must be prepared by the Discharger demonstrating that: (1) the facility has been evaluated, (2) none of the following materials or activities are, or will be in the foreseeable future, exposed to precipitation, and (3) all unauthorized NSWs have been eliminated:

1. Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed;
2. Materials or residuals on the ground or in storm water inlets from spills/leaks;
3. Materials or products from past industrial activity;
4. Material handling equipment (except adequately maintained vehicles);
5. Materials or products during loading/unloading or transporting activities;
6. Materials or products stored outdoors (except final products intended for outside use, i.e., new cars, where exposure to storm water does not result in the discharge of pollutants);
7. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
8. Materials or products handled/stored on roads or railways owned or maintained by the Discharger;
9. Waste material (except waste in covered, non-leaking containers, i.e., dumpsters);

New Dischargers must register for NEC coverage before the commencement of facility operations. Dischargers that fail to file for NEC coverage or apply for NOI coverage before the commencement of facility operations will be out of compliance and subject to enforcement.

Existing Dischargers have two options for submitting NECs:

1. Facility operators of “light industrial” facilities who have been operating under their original, no-certification-required permitting exemption must submit the NEC at any time prior to October 1, 2015. Dischargers who have not submitted an NEC or applied for permit coverage by this due date will be considered out of compliance and subject to Water Board enforcement.
2. Dischargers who have NOI coverage may register for NEC coverage at any time following completion of facility changes that result in the condition of “No Exposure”.

Q7. What happens if I know of changes that may cause exposure?

- A.** If exposure has the potential to occur in the near future due to some anticipated change at the facility, the Discharger must obtain NOI coverage to avoid potential enforcement for violations of this General Permit.

Q8. Is the NEC coverage transferable to a new Discharger?

- A.** No. If a new operator takes over your facility, the new operator must register for new NEC coverage prior to the transfer. A new application fee is required.

Q9. What is the exclusion “conditional” upon?

- A.** The exclusion from permit coverage requirements is “conditional” upon the certification of the Discharger that the facility does not have exposure of materials or activities to storm water. PRDs for NEC coverage shall be electronically submitted to the State Water Board and will not be accepted if incomplete. The Regional Water Board may review the information, contact and/or inspect the facility, and invalidate the NEC and require the Discharger to obtain NOI coverage. PRDs are

INSTRUCTIONS FOR NO EXPOSURE CERTIFICATION (NEC)

10. Application or disposal of processed wastewater (unless already covered by an NPDES permit); and
11. Particulate matter or visible deposits of residuals from roof stacks/vents evident in the storm water outflow.

APPENDIX 3

WATERBODIES WITH CLEAN WATER ACT SECTION 303(D) LISTED IMPAIRMENTS

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITIES (GENERAL PERMIT)

The 303(d) impairments below are sourced from the 2010 Integrated Report. The rows in red are impairments for which industrial storm water Dischargers subject to this General Permit are not required to analyze for additional parameters unless directed by the Regional Water Board, because these parameters are typically not associated with industrial storm water. Test methods with substantially similar or more stringent method detection limits may be used if approved by the staff of the State Water Board prior to sampling and analysis and upon approval, will be added into SMARTS. The rows that are not in red are impairments for which Dischargers in the 303(d) impaired watershed are required to analyze for additional parameters, if applicable, because these parameters are more likely to be associated with industrial storm water. See General Permit Section XI.B.6.e. In the event that any of the impairments in this appendix are subsequently delisted, the Dischargers with discharges to that watershed are no longer required to analyze for the additional parameters for those impairments, and the provisions for new Dischargers with discharges to 303(d) impaired water bodies contained in Section VII.B of this General Permit no longer apply for those impairments.

The Excel spreadsheet containing the water bodies with 303(d) impairments is an attachment to this Appendix 3. To view the attachment from an electronic (pdf) version of this Appendix 3, left-click on the paper clip icon to the left of this pdf file to make the attachment window appear, then double-click on the icon of an Excel spreadsheet. The Excel spreadsheet is also available on the Industrial Storm Water program pages of the State Water Resources Control Board's website (<http://www.waterboards.ca.gov/>).

ATTACHMENT 37



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I. BACKGROUND

A. History

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that established storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water to waters of the United States from construction projects that encompass five or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 lowered the permitting threshold from five acres to one acre.

While federal regulations allow two permitting options for storm water discharges (Individual Permits and General Permits), the State Water Board has elected to adopt only one statewide General Permit at this time that will apply to most storm water discharges associated with construction activity.

On August 19, 1999, the State Water Board reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ). On December 8, 1999 the State Water Board amended Order 99-08-DWQ to apply to sites as small as one acre.

The General Permit accompanying this fact sheet regulates storm water runoff from construction sites. Regulating many storm water discharges under one permit will greatly reduce the administrative burden associated with permitting individual storm water discharges. To obtain coverage under this General Permit, dischargers shall electronically file the Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance related documents required by this General Permit and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Quality Control Boards (Regional Water Boards) may issue General Permits or Individual Permits containing more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers.

B. Legal Challenges and Court Decisions

1. Early Court Decisions

Shortly after the passage of the CWA, the USEPA promulgated regulations exempting most storm water discharges from the NPDES permit requirements. (See 40 C.F.R. § 125.4 (1975); see also *Natural Resources Defense Council v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1372 (*Costle*); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1163 (*Defenders of Wildlife*)). When environmental groups challenged this exemption in federal court, the District of Columbia Court of Appeals invalidated the regulation, holding that the USEPA “does not have authority to exempt categories of point sources from the permit requirements of [CWA] § 402.” (*Costle*, 568 F.2d at 1377.) The *Costle* court rejected the USEPA’s argument that effluent-based storm sewer regulation was administratively infeasible because of the variable nature of storm water pollution and the number of affected storm sewers throughout the country. (*Id.* at 1377-82.) Although the court acknowledged the practical problems relating to storm sewer regulation, the court found the USEPA had the flexibility under the CWA to design regulations that would overcome these problems. (*Id.* at 1379-83.) In particular, the court pointed to general permits and permits based on requiring best management practices (BMPs).

During the next 15 years, the USEPA made numerous attempts to reconcile the statutory requirement of point source regulation with the practical problem of regulating possibly millions of diverse point source discharges of storm water. (See *Defenders of Wildlife*, 191 F.3d at 1163; see also Gallagher, Clean Water Act in Environmental Law Handbook (Sullivan, edit., 2003) p. 300 (Environmental Law Handbook); Eisen, *Toward a Sustainable Urbanism: Lessons from Federal Regulation of Urban Storm Water Runoff* (1995) 48 Wash. U.J. Urb. & Contemp. L.1, 40-41 [Regulation of Urban Storm Water Runoff].)

In 1987, Congress amended the CWA to require NPDES permits for storm water discharges. (See CWA § 402(p), 33 U.S.C. § 1342(p); *Defenders of Wildlife*, 191 F.3d at 1163; *Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1296.) In these amendments, enacted as part of the Water Quality Act of 1987, Congress distinguished between industrial and municipal storm water discharges. With respect to industrial storm water discharges, Congress provided that NPDES permits "shall meet all applicable provisions of this section and section 1311 [requiring the USEPA to establish effluent limitations under specific timetables]." (CWA § 402(p)(3)(A), 33 U.S.C. § 1342(p)(3)(A); see also *Defenders of Wildlife*, 191 F.3d at 1163-64.)

In 1990, USEPA adopted regulations specifying what activities were considered "industrial" and thus required discharges of storm water associated with those activities to obtain coverage under NPDES permits. (55 Fed. Reg. 47,990 (1990); 40 C.F.R. § 122.26(b)(14).) Construction activities, deemed a subset of the industrial activities category, must also be regulated by an NPDES permit. (40 C.F.R. § 122.26(b)(14)(x)). In 1999, USEPA issued regulations for "Phase II" of storm water regulation, which required most small construction sites (1-5 acres) to be regulated under the NPDES program. (64 Fed. Reg. 68,722; 40 C.F.R. § 122.26(b)(15)(i).)

2. Court Decisions on Public Participation

Two recent federal court opinions have vacated USEPA rules that denied meaningful public review of NPDES permit conditions. On January 14, 2003, the Ninth Circuit Court of Appeals held that certain aspects of USEPA's Phase II regulations governing MS4s were invalid primarily because the general permit did not contain express requirements for public participation. (*Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832.) Specifically, the court determined that applications for general permit coverage (including the Notice of Intent (NOI) and Storm Water Management Program (SWMP)) must be made available to the public, the applications must be reviewed and determined to meet the applicable standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings. (*Id.* at 852-54.) Similarly, on February 28, 2005, the Second Circuit Court of Appeals held that the USEPA's confined animal feeding operation (CAFO) rule violated the CWA because it allowed dischargers to write their own nutrient management plans without public review. (*Waterkeeper Alliance v. USEPA* (2d Cir. 2005) 399 F.3d 486.) Although neither decision involved the issuance of construction storm water permits, the State Water Board's Office of Chief Counsel has recommended that the new General Permit address the courts' rulings where feasible¹.

¹ In *Texas Independent Producers and Royalty Owners Assn. v. USEPA* (7th Cir. 2005) 410 F.3d 964, the Seventh Circuit Court of Appeals held that the USEPA's construction general permit was not required to provide the public with the opportunity for a public hearing on the Notice of Intent or Storm Water Pollution Prevention Plan. The Seventh Circuit briefly discussed why it agreed with the Ninth Circuit's dissent in *Environmental Defense Center*, but

The CWA and the USEPA's regulations provide states with the discretion to formulate permit terms, including specifying best management practices (BMPs), to achieve strict compliance with federal technology-based and water quality-based standards. (*Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) Accordingly, this General Permit has developed specific BMPs as well as numeric action levels (NALs) in order to achieve these minimum federal standards. In addition, the General Permit requires a SWPPP and REAP (another dynamic, site-specific plan) to be developed but has removed all language requiring the discharger to implement these plans – instead, the discharger is required to comply with specific requirements. By requiring the dischargers to implement these specific BMPs and NALs, this General Permit ensures that the dischargers do not “write their own permits.” As a result this General Permit does not require each discharger's SWPPP and REAP to be reviewed and approved by the Regional Water Boards.

This General Permit also requires dischargers to electronically file all permit-related compliance documents. These documents include, but are not limited to, NOIs, SWPPPs, annual reports, Notice of Terminations (NOTs), and numeric action level (NAL) exceedance reports. Electronically submitted compliance information is immediately available to the public, as well as the Regional Water Quality Control Board (Regional Water Board) offices, via the Internet. In addition, this General Permit enables public review and hearings on permit applications when appropriate. Under this General Permit, the public clearly has a meaningful opportunity to participate in the permitting process.

generally did not discuss the substantive holdings in *Environmental Defense Center and Waterkeeper Alliance*, because neither court addressed the initial question of whether the plaintiffs had standing to challenge the permits at issue. However, notwithstanding the Seventh Circuit's decision, it is not binding or controlling on the State Water Board because California is located within the Ninth Circuit.

C. Blue Ribbon Panel of Experts and Feasibility of Numeric Effluent Limitations

In 2005 and 2006, the State Water Board convened an expert panel (panel) to address the feasibility of numeric effluent limitations (NELs) in California's storm water permits. Specifically, the panel was asked to address:

"Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits? How would such limitations or criteria be established, and what information and data would be required?"

"The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:

The ability of the State Water Board to establish appropriate objective limitations or criteria;

How compliance determinations would be made;

The ability of dischargers and inspectors to monitor for compliance; and

The technical and financial ability of dischargers to comply with the limitations or criteria."

Through a series of public participation processes (State Water Board meetings, State Water Board workshops, and the solicitation of written comments), a number of water quality, public process and overall program effectiveness problems were identified. Some of these problems are addressed through this General Permit.

D. Summary of Panel Findings on Construction Activities

The panel's final report can be downloaded and viewed through links at www.waterboards.ca.gov or by clicking [here](#)².

The panel made the following observations:

"Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge."

"Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes."

² http://www.waterboards.ca.gov/stormwtr/docs/numeric/swpanel_final_report.pdf

“Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use.”

“To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites.”

“Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors.”

“The quality of storm water discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography.”

“The States of Oregon and Washington have recently adopted similar concepts to the Action Levels described earlier.”

In addition, the panel made the following conclusions:

“It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with storm water discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible.”

“The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers/equipment is exposed to storm water.”

“The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond.”

E. How the Panel’s Findings are Used in this General Permit

The State Water Board carefully considered the findings of the panel and related public comments. The State Water Board also reviewed and considered the comments regarding statewide storm water policy and the reissuance of the Industrial General Permit. From the input received the State Water Board identified some permit and program performance gaps that are addressed in this General Permit. The Summary of Significant Changes (below) in this General Permit are a direct result of this process.

F. Summary of Significant Changes in This General Permit

The State Water Board has significant changes to Order 99-08-DWQ. This General Permit differs from Order 99-08-DWQ in the following significant ways:

Rainfall Erosivity Waiver: this General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their site's given location and time frame compute to be less than or equal to 5.

Technology-Based Numeric Action Levels: this General Permit includes NALs for pH and turbidity.

Risk-Based Permitting Approach: this General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.

Minimum Requirements Specified: this General Permit imposes more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

Project Site Soil Characteristics Monitoring and Reporting: this General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

Effluent Monitoring and Reporting: this General Permit requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to evaluate whether NALs and NELs for Active Treatment Systems included in this General Permit are exceeded.

Receiving Water Monitoring and Reporting: this General Permit requires some Risk Level 3 and LUP Type 3 dischargers to monitor receiving waters and conduct bioassessments.

Post-Construction Storm Water Performance Standards: this General Permit specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize and/or mitigate post-construction storm water runoff impacts.

Rain Event Action Plan: this General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

Annual Reporting: this General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and public information.

Certification/Training Requirements for Key Project Personnel: this General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

Linear Underground/Overhead Projects: this General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).

II. RATIONALE

A. General Permit Approach

A general permit for construction activities is an appropriate permitting approach for the following reasons:

1. A general permit is an efficient method to establish the essential regulatory requirements for a broad range of construction activities under differing site conditions;
2. A general permit is the most efficient method to handle the large number of construction storm water permit applications;
3. The application process for coverage under a general permit is far less onerous than that for individual permit and hence more cost effective;
4. A general permit is consistent with USEPA's four-tier permitting strategy, the purpose of which is to use the flexibility provided by the CWA in designing a workable and efficient permitting system; and
5. A general permit is designed to provide coverage for a group of related facilities or operations of a specific industry type or group of industries. It is appropriate when the discharge characteristics are sufficiently similar, and a standard set of permit requirements can effectively provide environmental protection and comply with water quality standards for discharges. In most cases, the general permit will provide sufficient and appropriate management requirements to protect the quality of receiving waters from discharges of storm water from construction sites.

There may be instances where a general permit is not appropriate for a specific construction project. A Regional Water Board may require any discharger otherwise covered under the General Permit to apply for and obtain an Individual Permit or apply for coverage under a more specific General Permit. The Regional Water Board must determine that this General Permit does not provide adequate assurance that water quality will be protected, or that there is a site-specific reason why an individual permit should be required.

B. Construction Activities Covered

1. Construction activity subject to this General Permit:

Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or sale of one or more acres of disturbed land surface.

Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to USEPA regulations, such as dairy barns or food processing facilities.

Construction activity associated with LUPs including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete

and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.³

Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction⁴ (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction projects that intend to disturb one or more acres of land within the jurisdictional boundaries of a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the project.

2. Linear Underground/Overhead Projects (LUPs) subject to this General Permit:

Underground/overhead facilities typically constructed as LUPs include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Water Quality Order 2003-0007-DWQ regulated construction activities associated with small LUPs that resulted in land disturbances greater than one acre, but less than five acres. These projects were considered non-traditional construction projects. Attachment A of this Order now regulates all construction activities from LUPs resulting in land disturbances greater than one acre.

3. Common Plan of Development or Sale

USEPA regulations include the term “common plan of development or sale” to ensure that acreage within a common project does not artificially escape the permit requirements because construction activities are phased, split among smaller parcels, or completed by different owners/developers. In the absence of an

³ Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the USEPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

⁴ A construction site that includes a dredge and/or fill discharge to any water of the United States (e.g., wetland, channel, pond, or marine water) requires a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the Regional Water Board or State Water Board.

exact definition of “common plan of development or sale,” the State Water Board is required to exercise its regulatory discretion in providing a common sense interpretation of the term as it applies to construction projects and permit coverage. An overbroad interpretation of the term would render meaningless the clear “one acre” federal permitting threshold and would potentially trigger permitting of almost any construction activity that occurs within an area that had previously received area-wide utility or road improvements.

Construction projects generally receive grading and/or building permits (Local Permits) from local authorities prior to initiating construction activity. These Local Permits spell out the scope of the project, the parcels involved, the type of construction approved, etc. Referring to the Local Permit helps define “common plan of development or sale.” In cases such as tract home development, a Local Permit will include all phases of the construction project including rough grading, utility and road installation, and vertical construction. All construction activities approved in the Local Permit are part of the common plan and must remain under the General Permit until construction is completed. For custom home construction, Local Permits typically only approve vertical construction as the rough grading, utilities, and road improvements were already independently completed under the a previous Local Permit. In the case of a custom home site, the homeowner must submit plans and obtain a distinct and separate Local Permit from the local authority in order to proceed. It is not the intent of the State Water Board to require permitting for an individual homeowner building a custom home on a private lot of less than one acre if it is subject to a separate Local Permit. Similarly, the installation of a swimming pool, deck, or landscaping that disturbs less than one acre that was not part of any previous Local Permit are not required to be permitted.

The following are several examples of construction activity of less than one acre that would require permit coverage:

- a. A landowner receives a building permit(s) to build tract homes on a 100-acre site split into 200 one-third acre parcels, (the remaining acreage consists of streets and parkways) which are sold to individual homeowners as they are completed. The landowner completes and sells all the parcels except for two. Although the remaining two parcels combined are less than one acre, the landowner must continue permit coverage for the two parcels.
- b. One of the parcels discussed above is sold to another owner who intends to complete the construction as already approved in the Local Permit. The new landowner must file Permit Registration Documents (PRDs) to complete the construction even if the new landowner is required to obtain a separate Local Permit.
- c. Landowner in (1) above purchases 50 additional one half-acre parcels adjacent to the original 200-acre project. The landowner seeks a Local Permit (or amendment to existing Local permit) to build on 20 parcels while leaving the remaining 30 parcels for future development. The landowner must amend PRDs to include the 20 parcels 14 days prior to commencement of construction activity on those parcels.

C. Construction Activities Not Covered

1. Traditional Construction Projects Not Covered

This General Permit does not apply to the following construction activity:

- a. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

- b. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.
- c. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.
- d. Discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction projects in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit. Construction projects within the Lahontan region must also comply with the Lahontan Region Project Guideline for Erosion Control (R6T-2005-0007 Section), which can be found at http://www.waterboards.ca.gov/lahontan/Adopted_Orders/2005/r6t_2005_0007.pdf
- e. Construction activity that disturbs less than one acre of land surface, unless part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
- f. Construction activity covered by an individual NPDES Permit for storm water discharges.
- g. Landfill construction activity that is subject to the Industrial General Permit.
- h. Construction activity that discharges to Combined Sewer Systems.
- i. Conveyances that discharge storm water runoff combined with municipal sewage.
- j. Discharges of storm water identified in CWA § 402(I)(2), 33 U.S.C. § 1342(I)(2).

2. Linear Projects Not Covered

- a. LUP construction activity does not include linear routine maintenance projects. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements, or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:
 - i. Maintain the original purpose of the facility or hydraulic capacity.
 - ii. Update existing lines⁵ and facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.
 - iii. Repairing leaks.

⁵Update existing lines includes replacing existing lines with new materials or pipes.

Routine maintenance does not include construction of new⁶ lines or facilities resulting from compliance with applicable codes, standards, and regulations.

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must secure new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

- b. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).
- c. Tie-ins conducted immediately adjacent to “energized” or “pressurized” facilities by the discharger are not considered construction activities where all other LUP construction activities associated with the tie-in are covered by an NOI and SWPPP of a third party or municipal agency.

3. EPA’s Small Construction Rainfall Erosivity Waiver

EPA’s Storm Water Phase II Final Rule provides the option for a Small Construction Rainfall Erosivity Waiver. This waiver applies to small construction sites between 1 and 5 acres, and allows permitting authorities to waive those sites that do not have adverse water quality impacts.

Dischargers eligible for this waiver are exempt from Construction General Permit Coverage. In order to obtain the waiver, the discharger must certify to the State Water Board that small construction activity will occur only when the rainfall erosivity factor is less than 5 (“R” in the Revised Universal Soil Loss Equation). The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a practice that provides interim non-vegetative stabilization can be used for the end of the construction period. The operator must agree (as a condition waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the General Permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with a certification statement constitutes acceptance of and commitment to complete the final stabilization process. The discharger must submit a waiver certification to the State Board prior to commencing construction activities.

USEPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. Dischargers can access the calculator from EPA’s website at: www.epa.gov/npdes/stormwater/cgp. Use of the calculator allows the discharger to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage.

⁶New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

D. Obtaining and Terminating Permit Coverage

The appropriate Legally Responsible Person (LRP) must obtain coverage under this General Permit. To obtain coverage, the LRP or the LRP's Approved Signatory must file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

To obtain coverage under this General Permit, LRPs must electronically file the PRDs, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by this General Permit, and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Boards may issue General Permits or Individual Permits that contain more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers that obtain coverage under Individual Permits.

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

The application requirements of the General Permit establish a mechanism to clearly identify the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the General Permit's requirements.

This General Permit provides a grandfathering exception to existing dischargers subject to Water Quality Order No. 99-08-DWQ. Construction projects covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at Risk Level 1. LUP projects covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage at LUP Type 1. The Regional Water Boards have the authority to require Risk Determination to be performed on projects currently covered under Water Quality Order No. 99-08-DWQ and 2003-0007-DWQ where they deem necessary.

LRPs must file a Notice of Termination (NOT) with the Regional Water Board when construction is complete and final stabilization has been reached or ownership has been transferred. The discharger must certify that all State and local requirements have been met in accordance with this General Permit. In order for construction to be found complete, the discharger must install post-construction storm water management measures and establish a long-term maintenance plan. This requirement is intended to ensure that the post-construction conditions at the project site do not cause or contribute to direct or indirect water quality impacts (i.e., pollution and/or hydromodification) upstream and downstream. Specifically, the discharger must demonstrate compliance with the post-construction standards set forth in this General Permit (Section XIII). The discharger is responsible for all compliance issues including all annual fees until the NOT has been filed and approved by the local Regional Water Board.

E. Discharge Prohibitions

This General Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land, provided that the discharger satisfies all permit conditions set forth in the Order. This General Permit prohibits the discharge of pollutants other than storm water and non-storm water discharges authorized by this General Permit or another NPDES permit. This General Permit also prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges. In addition, this General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the nine Regional Water Boards. Discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural BMPs. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction projects. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water dewatering, and other discharges not subject to a separate general NPDES permit adopted by a region. Therefore this General Permit authorizes such discharges provided they meet the following conditions.

These authorized non-storm water discharges must:

1. be infeasible to eliminate;
2. comply with BMPs as described in the SWPPP;
3. filter or treat, using appropriate technology, all dewatering discharges from sedimentation basins;
4. meet the NALs for pH and turbidity; and
5. not cause or contribute to a violation of water quality standards.

Additionally, authorized non-storm water discharges must not be used to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. Authorized non-storm water dewatering discharges may require a permit because some Regional Water Boards have adopted General Permits for dewatering discharges.

This General Permit prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance.

F. Effluent Standards for All Types of Discharges

1. Technology-Based Effluent Limitations

Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) for toxic pollutants and non conventional pollutants and best conventional pollutant control technology (BCT) for conventional pollutants. Additionally, these provisions require controls of pollutant discharges to reduce pollutants and any more stringent controls necessary to meet water quality standards. The USEPA has already established such limitations, known as effluent limitation guidelines (ELGs), for some industrial categories. This is not the case with construction discharges. In instances where there are no ELGs the permit writer is to use best professional judgment (BPJ) to establish requirements that the discharger must meet using BAT/BCT technology. This General Permit contains only narrative effluent limitations and does not contain numeric effluent limitations, except for Active Treatment Systems (ATS).

Order No. 2009-0009-DWQ, as originally adopted by the State Water Board on September 2, 2009, contained numeric effluent limitations for pH (within the range of 6.0 and 9.0 pH units) and turbidity (500 NTU) that applied only to Risk Level 3 and LUP Type 3 construction sites. The State Water Board adopted the numeric effluent limitations as technology-based effluent limitations based upon its best professional judgment. The California Building Industry Association, the Building Industry Legal Defense

Foundation, and the California Business Properties Association (petitioners) challenged Order No. 2009-0009-DWQ in *California Building Industry Association et al. v. State Water Resources Control Board*. On December 27, 2011, the Superior Court issued a judgment and writ of mandamus. The Superior Court ruled in favor of the State Water Board on almost all of the issues the petitioners raised, but the Superior Court invalidated the numeric effluent limitations for pH and turbidity for Risk Level 3 and LUP Type 3 sites because it determined that the State Water Board did not have sufficient BMP performance data to support those numeric effluent limitations. Therefore, the Superior Court concluded that the State Water Board did not comply with the federal regulations that apply to the use of best professional judgment. In invalidating the numeric effluent limitations, the Superior Court also suspended two ancillary requirements (a compliance storm event provision and receiving water monitoring at Risk Level 3 and LUP Type 3 sites that violated the numeric effluent limitations) that related solely to the invalidated numeric effluent limitations.

As a result of the Superior Court's writ of mandamus, this Order no longer contains numeric effluent limitations for pH and turbidity, except for ATS. In addition, as a result of the Superior Court's writ of mandamus, the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 sites were suspended until the State Water Board amended this Order to restore the receiving water monitoring requirements. As amended, this Order now requires Risk Level 3 and LUP Type 3 Dischargers with direct discharges to surface waters to conduct receiving water monitoring whenever their effluent exceeds specified receiving water monitoring triggers. The receiving water monitoring triggers were established at the same levels as the previous numeric effluent limitations (effluent pH outside the range of 6.0 and 9.0 pH units or turbidity exceeding 500 NTU). In restoring the receiving water monitoring requirements, the State Water Board determined that it was appropriate to require receiving water monitoring for these types of sites with direct discharges to surface waters that exceeded the receiving water monitoring triggers under any storm event scenarios, because these sites represent the highest threat to receiving water quality. An exceedance of a receiving water monitoring trigger does not constitute a violation of this General Permit. These receiving water monitoring requirements take effect on the effective date of the amendment to this Order.

BAT/BCT technologies not only include passive systems such as conventional runoff and sediment control, but also treatment systems such as coagulation/flocculation using sand filtration, when appropriate. Such technologies allow for effective treatment of soil particles less 0.02 mm (medium silt) in diameter. The discharger must install structural-controls, as necessary, such as erosion and sediment controls that meet BAT and BCT to achieve compliance with water quality standards. The narrative effluent limitations constitute compliance with the requirements of the CWA.

Because the permit is an NPDES permit, there is no legal requirement to address the factors set forth in Water Code sections 13241 and 13263, unless the permit is more stringent than what federal law requires. (See *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 627.) None of the requirements in this permit are more stringent than the minimum federal requirements, which include technology-based requirements achieving BAT/BCT and strict compliance with water quality standards. The inclusion of numeric effluent limitations (NELs) in the permit for Active Treatment Systems does not cause the permit to be more stringent than current federal law. NELs and best management practices are simply two different methods of achieving the same federal requirement: strict compliance with state water quality standards. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The use of NELs to achieve compliance with water quality standards is not a more stringent requirement than the use of BMPs. (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Accordingly, the State Water Board does not need to take into account the factors in Water Code sections 13241 and 13263.

The State Water Board has concluded that the establishment of BAT/BCT will not create or aggravate other environmental problems through increases in air pollution, solid waste generation, or energy consumption.—While there may be a slight increase in non-water quality impacts due to the implementation of additional monitoring or the construction of additional BMPs, these impacts will be negligible in comparison with the construction activities taking place on site and would be justified by the water quality benefits associated with compliance.

pH Receiving Water Monitoring Trigger

Given the potential contaminants, the minimum standard method for control of pH in runoff requires the use of preventive measures such as avoiding concrete pours during rainy weather, covering concrete and directing flow away from fresh concrete if a pour occurs during rain, covering scrap drywall and stucco materials when stored outside and potentially exposed to rain, and other housekeeping measures. If necessary, pH-impaired storm water from construction sites can be treated in a filter or settling pond or basin, with additional natural or chemical treatment required to meet pH limits set forth in this permit. The basin or pond acts as a collection point and holds storm water for a sufficient period for the contaminants to be settled out, either naturally or artificially, and allows any additional treatment to take place. The State Water Board considers these techniques to be equivalent to BCT. In determining the pH concentration trigger for discharges, the State Water Board used BPJ to set these limitations.

The chosen trigger was established by calculating three standard deviations above and below the mean pH of runoff from highway construction sites⁷ in California. Proper implementation of BMPs should result in discharges that are within the range of 6.0 to 9.0 pH Units.

Turbidity Receiving Water Monitoring Trigger

The Turbidity receiving water monitoring trigger of 500 NTU is a technology-based trigger and was developed using three different analyses aimed at finding the appropriate threshold to set the technology-based limit to ensure environmental protection, effluent quality and cost-effectiveness. The analyses fell into three, main types: (1) an ecoregion-specific dataset developed by Simon et. al. (2004)⁸; (2) Statewide Regional Water Quality Control Board enforcement data; and (3) published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites.

A 1:3 relationship between turbidity (expressed as NTU) and suspended sediment concentration (expressed as mg/L) is assumed based on a review of suspended sediment and turbidity data from three gages used in the USGS National Water Quality Assessment Program:

USGS 11074000 SANTA ANA R BL PRADO DAM CA
USGS 11447650 SACRAMENTO R A FREEPORT CA
USGS 11303500 SAN JOAQUIN R NR VERNALIS CA

The receiving water monitoring trigger represents staff determination that the trigger value is the most practicable based on available data. The turbidity receiving water monitoring trigger represents a bridge between the narrative effluent limitations and receiving water limitations. To support this receiving water monitoring trigger, State Water Board staff analyzed construction site discharge information (monitoring data, estimates) and receiving water monitoring information.

Since the turbidity receiving water monitoring trigger represents an appropriate threshold level expected at a site, compliance with this value does not necessarily represent compliance with either the narrative effluent limitations (as enforced through the BAT/BCT standard) or the receiving water limitations. In the San Diego region, some inland surface waters have a receiving water objective for turbidity equal to 20 NTU. Obviously a discharge up to, but not exceeding, the turbidity receiving water monitoring trigger of

⁷ Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/storm_water/pdf/CTSW-RT-02-055.pdf.

500 NTU may still cause or contribute to the exceedance of the 20 NTU standard. Most of the waters of the State are protected by turbidity objectives based on background conditions.

Table 1 - Regional Water Board Basin Plans, Water Quality Objectives for Turbidity

REGIONAL WATER BOARD	WQ Objective	Background/Natural Turbidity	Maximum Increase
1	Based on background	All levels	20%
2	Based on background	> 50 NTU	10%
3	Based on background	0-50 JTU 50-100 JTU > 100 JTU	20% 10 NTU 10%
4	Based on background	0-50 NTU > 50 NTU	20% 10%
5	Based on background	0-5 NTU 5-50 NTU 50-100 NTU >100 NTU	1 NTU 20% 10 NTU 10%
6	Based on background	All levels	10%
7	Based on background	N/A	N/A
8	Based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%
9	Inland Surface Waters, 20 NTU All others, based on background	 0-50 NTU 50-100 NTU >100 NTU	 20% 10 NTU 10%

Table 2 shows the suspended sediment concentrations at the 1.5 year flow recurrence interval for the 12 ecoregions in California from Simon et. al (2004).

Table 2 - Results of Ecoregion Analysis

Ecoregion	Percent of California Land Area	Median Suspended Sediment Concentration (mg/L)
1	9.1	874
4	0.2	120
5	8.8	35.6
6	20.7	1530
7	7.7	122
8	3.0	47.4
9	9.4	284
13	5.2	143
14	21.7	5150
78	8.1	581
80	2.4	199
81	3.7	503
Area-weighted average		1633

If a 1:3 relationship between turbidity and suspended sediment is assumed, the median turbidity is 544 NTU.

The following table is composed of turbidity readings measured in NTUs from administrative civil liability (ACL) actions for construction sites from 2003 - 2009. This data was derived from the complete listing of construction-related ACLs for the six year period. All ACLs were reviewed and those that included turbidimeter readings at the point of storm water discharge were selected for this dataset.

Table 3 – ACL Sampling Data taken by Regional Water Board Staff

WDID#	Region	Discharger	Turbidity (NTU)
5S34C331884	5S	Bradshaw Interceptor Section 6B	1800
5S05C325110	5S	Bridalwood Subdivision	1670
5S48C336297	5S	Cheyenne at Browns Valley	1629
5R32C314271	5R	Grizzly Ranch Construction	1400
6A090406008	6T	El Dorado County Department of Transportation, Angora Creek	97.4
5S03C346861	5S	TML Development, LLC	1600
6A31C325917	6T	Northstar Village	See Subdata Set

Subdata Set - Turbidity for point of storm water runoff discharge at Northstar Village

Date	Turbidity (NTU)	Location
10/5/2006	900	Middle Martis Creek
11/2/2006	190	Middle Martis Creek
01/04/2007	36	West Fork, West Martis Creek
02/08/2007	180	Middle Martis Creek
02/09/2007	130	Middle Martis Creek
02/09/2007	290	Middle Martis Creek
02/09/2007	100	West Fork, West Martis Creek
02/10/2007	28	Middle Martis Creek
02/10/2007	23	Middle Martis Creek
02/10/2007	32	Middle Martis Creek
02/10/2007	12	Middle Martis Creek
02/10/2007	60	West Fork, West Martis Creek
02/10/2007	34	West Fork, West Martis Creek

A 95% confidence interval for mean turbidity in an ACL order was constructed. The data set used was a small sample size, so the 500 NTU (the value derived as the receiving water monitoring trigger for this General Permit) needed to be verified as a possible population mean. In this case, the population refers to a hypothetical population of turbidity measurements of which our sample of 20 represents. A t-distribution was assumed due to the small sample size:

<p>Mean: 512.23 NTU Standard Deviation: 686.85 Margin of Error: 321.45 Confidence Interval: 190.78 NTU (Low) 833.68 NTU (High)</p>
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Based on a constructed 95% confidence interval, an ACL order turbidity measurement will be between 190.78 – 833.68 NTU. 500 NTU falls within this range. Using the same data set, a small-sample hypothesis test was also performed to test if the ACL turbidity data set contains enough information to cast doubt on choosing a 500 NTU as a mean. 500 NTU was again chosen due to its proposed use as an acceptable value. The test was carried out using a 95% confidence interval. Results indicated that the ACL turbidity data set *does not* contain significant sample evidence to reject the claim of 500 NTU as an acceptable mean for the ACL turbidity population.

There are not many published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites. The most often cited study is a report titled, “Improving the Cost Effectiveness of Highway Construction Site Erosion and Pollution Control” (Horner, Guedry, and Korten Hof 1990, <http://www.wsdot.wa.gov/Research/Reports/200/200.1.htm>). In a comment letter summarizing this report sent to the State Water Board, the primary author, Dr. Horner, states:

“The most effective erosion control product was wood fiber mulch applied at two different rates along with a bonding agent and grass seed in sufficient time before the tests to achieve germination. Plots treated in this way reduced influent turbidity by more than 97 percent and discharged effluent exhibiting mean and maximum turbidity values of 21 and 73 NTU, respectively. Some other mulch and blanket materials performed nearly as well. These tests demonstrated the control ability of widely available BMPs over a very broad range of erosion potential.”

Other technologies studied in this report produced effluent quality at or near 100 NTU. It is the BPJ of the State Water Board staff that erosion control, while preferred, is not always an option on construction sites and that technology performance in a controlled study showing effluent quality directly leaving a BMP is always easier and cheaper to control than effluent being discharged from the project (edge of property, etc.). As a result, it is the BPJ of the State Water Board staff that it is not cost effective or feasible, at this time, for all risk level and type 3 sites in California to achieve effluent discharges with turbidity values that are less than 100 NTU.

To summarize, the analysis showed that: (1) results of the Simon et. al dataset reveals turbidity values in background receiving water in California’s ecoregions range from 16 NTU to 1716 NTU (with a mean of 544 NTU); (2) based on a constructed 95% confidence interval, construction sites will be subject to administrative civil liability (ACL) when their turbidity measurement falls between 190.78 – 833.68 NTU; and (3) sites with highly controlled discharges employing and maintaining good erosion control practices can discharge effluent from the BMP with turbidity values less than 100 NTU. State Water Board staff has determined, using its BPJ, that it is most cost effective to set the receiving water monitoring trigger for turbidity at 500 NTU.

i. Compliance Storm Event

While this General Permit no longer contains “compliance storm event” exceptions from technology-based NELs, the “compliance storm event” exception from the ATS NELs remain in effect. See Section K of this Fact Sheet, and Attachment F of this General Permit for more information.

a. TMDLs and Waste Load Allocations

Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL for sediment has been adopted by the Regional Water Board or USEPA, must comply with the approved TMDL if it identifies “construction activity” or land disturbance as a source of sediment. If it does, the

TMDL should include a specific waste load allocation for this activity/source. The discharger, in this case, may be required by a separate Regional Water Board order to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. If a specific waste load allocation has been established that would apply to a specific discharge, the Regional Water Board may adopt an order requiring specific implementation actions necessary to meet that allocation. In the instance where an approved TMDL has specified a general waste load allocation to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, dischargers must consult with the state TMDL authority⁹ to confirm that adherence to a SWPPP that meets the requirements of the General Permit will be consistent with the approved TMDL.

2. Determining Compliance with Effluent Standards

a. Technology-Based Numeric Action Levels (NALs)

This General Permit contains technology-based NALs for pH and turbidity, and requirements for effluent monitoring at all Risk level 2 & 3, and LUP Type 2 & 3 sites. Numeric action levels are essentially numeric benchmark values for certain parameters that, if exceeded in effluent sampling, trigger the discharger to take actions. Exceedance of an NAL does not itself constitute a violation of the General Permit. If the discharger fails to take the corrective action required by the General Permit, though, that may constitute a violation.

The primary purpose of NALs is to assist dischargers in evaluating the effectiveness of their on-site measures. Construction sites need to employ many different systems that must work together to achieve compliance with the permit's requirements. The NALs chosen should indicate whether the systems are working as intended.

Another purpose of NALs is to provide information regarding construction activities and water quality impacts. This data will provide the State and Regional Water Boards and the rest of the storm water community with more information about levels and types of pollutants present in runoff and how effective the dischargers BMPs are at reducing pollutants in effluent. The State Water Board also hopes to learn more about the linkage between effluent and receiving water quality. In addition, these requirements will provide information on the mechanics needed to establish compliance monitoring programs at construction sites in future permit deliberations.

i. *pH*

The chosen limits were established by calculating one standard deviation above and below the mean pH of runoff from highway construction sites¹⁰ in California. Proper implementation of BMPs should result in discharges that are within the range of 6.5 to 8.5 pH Units.

⁹ <http://www.waterboards.ca.gov/tmdl/tmdl.html>.

¹⁰ Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf>.

The Caltrans study included 33 highway construction sites throughout California over a period of four years, which included 120 storm events. All of these sites had BMPs in place that would be generally implemented at all types of construction sites in California.

ii. *Turbidity*

BPJ was used to develop an NAL that can be used as a learning tool to help dischargers improve their site controls, and to provide meaningful information on the effectiveness of storm water controls. A statewide turbidity NAL has been set at 250 NTU.

G. Receiving Water Limitations

Construction-related activities that cause or contribute to an exceedance of water quality standards must be addressed. The dynamic nature of construction activity gives the discharger the ability to quickly identify and monitor the source of the exceedances. This is because when storm water mobilizes sediment, it provides visual cues as to where corrective actions should take place and how effective they are once implemented.

This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards. The monitoring requirements in this General Permit for sampling and analysis procedures will help determine whether BMPs installed and maintained are preventing pollutants in discharges from the construction site that may cause or contribute to an exceedance of water quality standards.

Water quality standards consist of designated beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. When adopted by the State Water Board or a Regional Water Board, the ambient criteria are termed “water quality objectives.” If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to an exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff.)

In California, water quality standards are published in the Basin Plans adopted by each Regional Water Board, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan.

Dischargers can determine the applicable water quality standards by contacting Regional Water Board staff or by consulting one of the following sources. The actual Basin Plans that contain the water quality standards can be viewed at the website of the appropriate Regional Water Board. (<http://www.waterboards.ca.gov/regions.html>), the State Water Board site for statewide plans (<http://www.waterboards.ca.gov/plnspols/index.html>), or the USEPA regulations for the NTR and CTR (40 C.F.R. §§ 131.36-38). Basin Plans and statewide plans are also available by mail from the appropriate Regional Water Board or the State Water Board. The USEPA regulations are available at <http://www.epa.gov/>. Additional information concerning water quality standards can be accessed through http://www.waterboards.ca.gov/stormwtr/gen_const.html.

H. Training Qualifications and Requirements

The Blue Ribbon Panel (BRP) made the following observation about the lack of industry-specific training requirements:

“Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors.”

Order 99-08-DWQ required that all dischargers train their employees on how to comply with the permit, but it did not specify a curriculum or certification program. This has resulted in inconsistent implementation by all affected parties - the dischargers, the local governments where the construction activity occurs, and the regulators required to enforce 99-08-DWQ. This General Permit requires Qualified SWPPP Developers and practitioners to obtain appropriate training, and makes this curriculum mandatory two years after adoption, to allow time for course completion. The State and Regional Water Board are working with many stakeholders to develop the curriculum and mechanisms needed to develop and deliver the courses.

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, the Qualified SWPPP Developer and Qualified SWPPP Practitioners responsible for creating, revising, overseeing, and implementing the SWPPP must attend a State Water Board-sponsored or approved Qualified SWPPP Developer and Qualified SWPPP Practitioner training course.

I. Sampling, Monitoring, Reporting and Record Keeping

1. Traditional Construction Monitoring Requirements

This General Permit requires visual monitoring at all sites, and effluent water quality at all Risk Level 2 & 3 sites. It requires receiving water monitoring at some Risk Level 3 sites. All sites are required to submit annual reports, which contain various types of information, depending on the site characteristics and events. A summary of the monitoring and reporting requirements is found in Table 4.

Table 4 - Required Monitoring Elements for Risk Levels

	Visual	Non-visible Pollutant	Effluent	Receiving Water
Risk Level 1			where applicable	not required
Risk Level 2			pH, turbidity	not required
Risk Level 3	three types required for all Risk Levels: non-storm water, pre-rain and post-rain	As needed for all Risk Levels (see below)	pH, turbidity	(if Receiving Water Monitoring Trigger exceeded) pH, turbidity and SSC. Bioassessment for sites 30 acres or larger.

a. Visual

All dischargers are required to conduct quarterly, non-storm water visual inspections. For these inspections, the discharger must visually observe each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. For storm-related inspections, dischargers must visually observe storm water discharges at all discharge locations within two business days after a qualifying event. For this requirement, a qualifying rain event is one producing precipitation of ½ inch or more of discharge. Dischargers must conduct a post-storm event inspection to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify any additional BMPs necessary and revise the SWPPP accordingly. Dischargers must maintain on-site records of all visual observations, personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

b. Non-Visible Pollutant Monitoring

This General Permit requires that all dischargers develop a sampling and analysis strategy for monitoring pollutants that are not visually detectable in storm water. Monitoring for non-visible pollutants must be required at any construction site when the exposure of construction materials occurs and where a discharge can cause or contribute to an exceedance of a water quality objective.

Of significant concern for construction discharges are the pollutants found in materials used in large quantities at construction sites throughout California and exposed throughout the rainy season, such as cement, flyash, and other recycled materials or by-products of combustion. The water quality standards that apply to these materials will depend on their composition. Some of the more common storm water pollutants from construction activity are not CTR pollutants. Examples of non-visible pollutants include glyphosate (herbicides), diazinon and chlorpyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants). The use of diazinon and chlorpyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if these materials come into contact with storm water. High pH values from cement and gypsum, high pH and SSC from wash waters, and chemical/fecal contamination from portable toilets, also are not CTR pollutants. Although some of these constituents do have numeric water quality objectives in individual Basin Plans, many do not and are subject only to narrative water quality standards (i.e. not causing toxicity). Dischargers are encouraged to discuss these issues with Regional Water Board staff and other storm water quality professionals.

The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore receiving waters sampling is not required. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site.

Preventing or eliminating the exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer's instructions and at a time when they are unlikely to be washed away. Other construction materials can be exposed when storage, waste disposal or the application of the material is done in a manner not protective of water quality. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed. In cases where construction materials may be exposed to storm water, but the storm water is contained and is not allowed to run off the site, sampling will only be required when inspections show that the containment failed or is breached, resulting in potential exposure or discharge to receiving waters.

The discharger must develop a list of potential pollutants based on a review of potential sources, which will include construction materials soil amendments, soil treatments, and historic contamination at the site. The discharger must review existing environmental and real estate documentation to determine the potential for pollutants that could be present on the construction site as a result of past land use activities.

Good sources of information on previously existing pollution and past land uses include:

- i. Environmental Assessments;
- ii. Initial Studies;
- iii. Phase 1 Assessments prepared for property transfers; and
- iv. Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act.

In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.

The potential pollutant list must include all non-visible pollutants that are known or should be known to occur on the construction site including, but not limited to, materials that:

- i. are being used in construction activities;
- ii. are stored on the construction site;
- iii. were spilled during construction operations and not cleaned up;
- iv. were stored (or used) in a manner that created the potential for a release of the materials during past land use activities;
- v. were spilled during previous land use activities and not cleaned up; or
- vi. were applied to the soil as part of past land use activities.

c. Effluent Monitoring

Federal regulations¹¹ require effluent monitoring for discharges subject to NALs. Subsequently, all Risk Level 2 and 3 dischargers must perform sampling and analysis of effluent discharges to characterize discharges associated with construction activity from the entire area disturbed by the project. Dischargers must collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

Table 5 - Storm Water Effluent Monitoring Requirements by Risk Level

	Frequency	Effluent Monitoring (Section E, below)
Risk Level 1	when applicable	non-visible pollutant parameters (if applicable)
Risk Level 2	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters (if applicable)
Risk Level 3	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters if applicable

Risk Level 1 dischargers must analyze samples for:

- i. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment C contained in the General Permit.

¹¹ 40 C.F.R. § 122.44.

Risk Level 2 dischargers must analyze samples for:

- i. pH and turbidity;
- ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment D contained in the General Permit, and
- iii. any additional parameters for which monitoring is required by the Regional Water Board.

Risk Level 3 dischargers must analyze samples for:

- i. pH, turbidity;
- ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment E contained in the General Permit, and
- iii. any additional parameters for which monitoring is required by the Regional Water Board.

2. Linear Monitoring and Sampling Requirements

Attachment A, establishes minimum monitoring and reporting requirements for all LUPs. It establishes different monitoring requirements depending on project complexity and risk to water quality. The monitoring requirements for Type 1 LUPs are less than Type 2 & 3 projects because Type 1 projects have a lower potential to impact water quality.

A discharger shall prepare a monitoring program prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.

a. Type 1 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 1 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be conducted in conjunction with other daily activities. Inspections will be conducted to ensure the BMPs are adequate, maintained, and in place at the end of the construction day. The discharger will revise the SWPPP, as appropriate, based on the results of the daily inspections. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures have been installed, and successful final vegetative cover or other stabilization criteria have been met).

A discharger shall implement the monitoring program for inspecting Type 1 LUPs. This program requires temporary and permanent stabilization BMPs after active construction is completed. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where re-vegetation is chosen until minimum vegetative coverage has been established. Photographs shall be taken during site inspections and submitted to the State Water Board.

b. Type 2 & 3 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 2 & 3 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be in conjunction with other daily activities.

All dischargers of Type 2 & 3 LUPs are required to conduct inspections by qualified personnel of the construction site during normal working hours prior to all anticipated storm events and after actual storm events. During extended storm events, the discharger shall conduct inspections during normal working hours for each 24-hour period. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures installed, and successful vegetative cover or other stabilization criteria have been met).

The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) to determine whether additional control practices or corrective maintenance activities are needed. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

All dischargers shall develop and implement a monitoring program for inspecting Type 2 & 3 LUPs that require temporary and permanent stabilization BMPs after active construction is completed. Inspections will be conducted to ensure the BMPs are adequate and maintained. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where revegetation is chosen until minimum vegetative coverage has been established.

A log of inspections conducted before, during, and after the storm events must be maintained in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection. Photographs must be taken during site inspections and submitted to the State Water Board.

C. Sampling Requirements for all LUP Project Types

LUPs are also subject to sampling and analysis requirements for visible pollutants (i.e., sedimentation/siltation, turbidity) and for non-visible pollutants.

Sampling for visible pollutants is required for Type 2 & 3 LUPs.

Non-visible pollutant monitoring is required for pollutants associated with construction sites and activities that (1) are not visually detectable in storm water discharges, and (2) are known or should be known to occur on the construction site, and (3) could cause or contribute to an exceedance of water quality objectives in the receiving waters. Sample collection for non-visible pollutants must only be required (1) during a storm event when pollutants associated with construction activities may be discharged with storm water runoff due to a spill, or in the event there was a breach, malfunction, failure, and/or leak of any BMP, and (2) when the discharger has failed to adequately clean the area of material and pollutants. Failure to implement appropriate BMPs will trigger the same sampling requirements as those required for a breach, malfunction and/or leak, or when the discharger has failed to implement appropriate BMPs prior to the next storm event.

Additional monitoring parameters may be required by the Regional Water Boards.

It is not anticipated that many LUPs will be required to collect samples for pollutants not visually detected in runoff due to the nature and character of the construction site and activities as previously described in this fact sheet. Most LUPs are constructed in urban areas with public access (e.g., existing roadways, road shoulders, parking areas, etc.). This raises a concern regarding the potential contribution of pollutants from vehicle use and/or from normal activities of the public (e.g., vehicle washing, landscape fertilization, pest spraying, etc.) in runoff from the project site. Since the dischargers are not the land owners of the project area and are not able to control the presence of these pollutants in the storm water that runs through their projects, it is not the intent of this General Permit to require dischargers to sample for these pollutants. This General Permit does not require the discharger to sample for these types of pollutants except where the discharger has brought materials onsite that contain these pollutants and when a condition (e.g., breach, failure, etc.) described above occurs.

3. Receiving Water Monitoring

In order to ensure that receiving water limitations are met, dischargers subject to receiving water monitoring triggers (i.e., Risk Level 3 and LUP Type 3 sites) or numeric effluent limitations (i.e., Risk Level 3 and LUP Type 3 sites utilizing ATS with direct discharges into receiving waters) must also monitor the downstream receiving water(s) for turbidity, SSC, and pH (if applicable) when a receiving water monitoring trigger or NEL is exceeded.

a. Bioassessment Monitoring

This General Permit requires a bioassessment of receiving waters for dischargers of Risk Level 3 or LUP Type 3 construction projects equal to or larger than 30 acres with direct discharges into receiving waters. Benthic macroinvertebrate samples will be taken upstream and downstream of the site's discharge point in the receiving water. Bioassessments measure the quality of the stream by analyzing the aquatic life present. Higher levels of appropriate aquatic species tend to indicate a healthy stream; whereas low levels of organisms can indicate stream degradation. Active construction sites have the potential to discharge large amounts of sediment and pollutants into receiving waters. Requiring a bioassessment for large project sites, with the most potential to impact water quality, provides a snapshot of the health of the receiving water prior to initiation of construction activities. This snapshot can be used in comparison to the health of the receiving water after construction has commenced.

Each ecoregion (biologically and geographically related area) in the State has a specific yearly peak time where stream biota is in a stable and abundant state. This time of year is called an Index Period. The bioassessment requirements in this General Permit, requires benthic macroinvertebrate sampling within a sites index period. The State Water Board has developed a map designating index periods for the ecoregions in the State (see State Water Board Website).

This General Permit requires the bioassessment methods to be in accordance with the Surface Water Ambient Monitoring Program (SWAMP) in order to provide data consistency within the state as well as generate useable biological stream data.

Table 6 - Receiving Water Monitoring Requirements

	Receiving Water Monitoring Parameters
Risk Level 1 /LUP Type 1	not required
Risk Level 2 / LUP Type 2	not required
Risk Level 3 / LUP Type 3	If Receiving Water Monitoring Trigger exceeded: pH (if applicable), turbidity, and SSC. Bioassessment for sites 30 acres or larger.

4. Reporting Requirements

a. NAL Exceedance Report

All Risk Level 3 and LUP Type 3 dischargers must electronically submit all storm event sampling results to the State And Regional Boards, via the electronic data system, no later than 10 days after the conclusion of the storm event.

b. Annual Report

All dischargers must prepare and electronically submit an annual report no later than September 1 of each year using the Storm water Multi-Application Reporting and Tracking System (SMARTS). The

Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year, and identification of any compliance activities or corrective actions that were not implemented.

5. Record Keeping

According to 40 C.F.R. Parts 122.21(p) and 122.41(j), the discharger is required to retain paper or electronic copies of all records required by this General Permit for a period of at least three years from the date generated or the date submitted to the State Water Board or Regional Water Boards. A discharger must retain records for a period beyond three years as directed by Regional Water Board.

J. Risk Determination

1. Traditional Projects

a. Overall Risk Determination

There are two major requirements related to site planning and risk determination in this General Permit. The project's overall risk is broken up into two elements – (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters).

Project Sediment Risk:

Project Sediment Risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. The RUSLE equation is as follows:

$$A = (R)(K)(LS)(C)(P)$$

Where: A = the rate of sheet and rill erosion

R = rainfall-runoff erosivity factor

K = soil erodibility factor

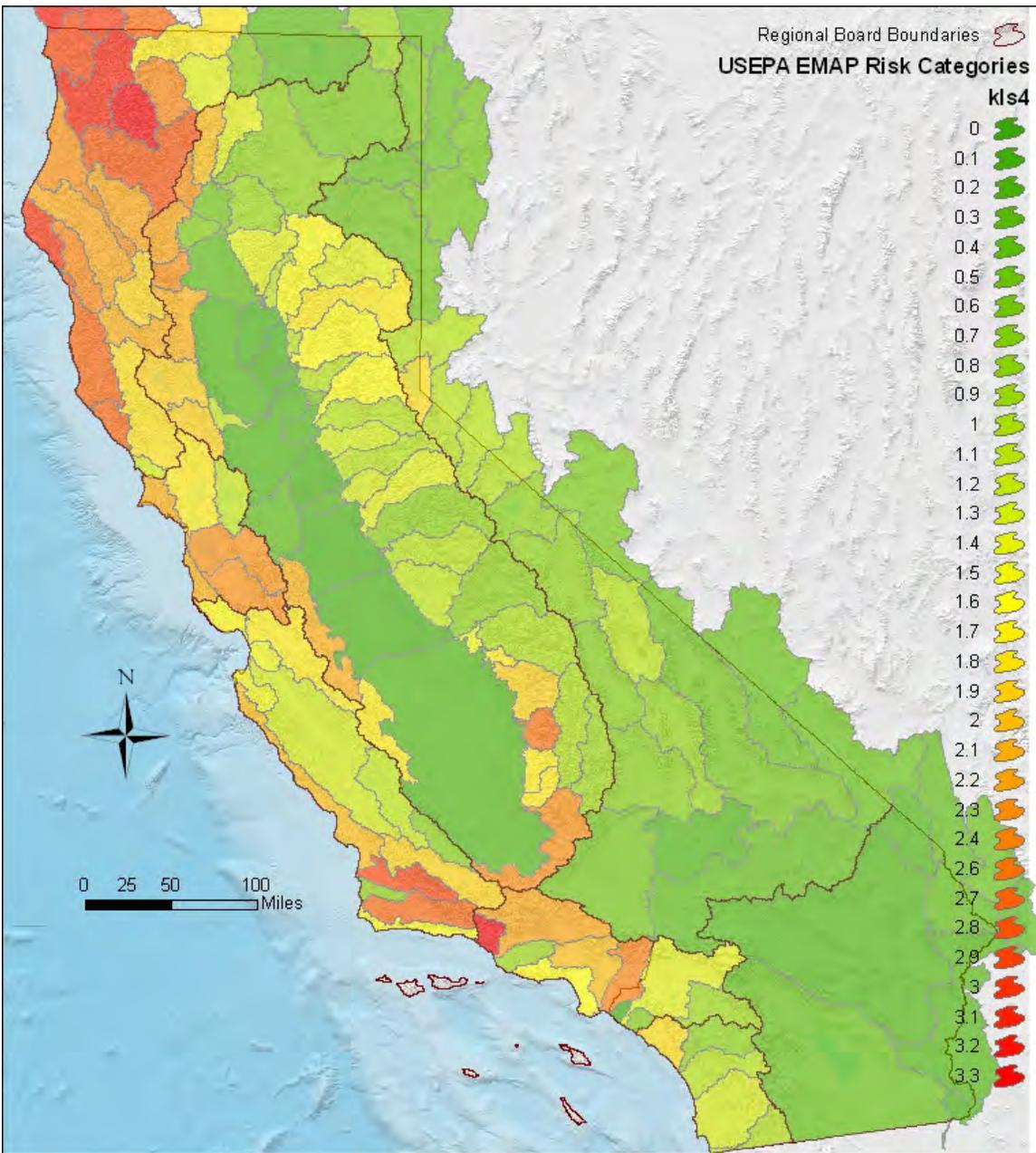
LS = length-slope factor

C = cover factor (erosion controls)

P = management operations and support practices (sediment controls)

The C and P factors are given values of 1.0 to simulate bare ground conditions.

There is a map option and a manual calculation option for determining soil loss. For the map option, the R factor for the project is calculated using the online calculator at <http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm>. The product of K and LS are shown on Figure 1. To determine soil loss in tons per acre, the discharger multiplies the R factor times the value for K times LS from the map.



State Water Resources Control Board, January 15, 2008

Figure 1 -Statewide Map of K * LS

For the manual calculation option, the R factor for the project is calculated using the online calculator at <http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm>. The K and LS factors are determined using Appendix 1.

Soil loss of less than 15 tons/acre is considered **low** sediment risk.
 Soil loss between 15 and 75 tons/acre is **medium** sediment risk.
 Soil loss over 75 tons/acre is considered **high** sediment risk.

The soil loss values and risk categories were obtained from mean and standard deviation RKLS values from the USEPA EMAP program. High risk is the mean RKLS value plus two standard deviations. Low risk is the mean RKLS value minus two standard deviations.

Receiving Water Risk:

Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody. A sediment-sensitive waterbody is either

- on the most recent 303d list for waterbodies impaired for sediment;
- has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; **or**
- has the beneficial uses of COLD, SPAWN, and MIGRATORY.

A project that meets at least one of the three criteria has a high receiving water risk. A list of sediment-sensitive waterbodies will be posted on the State Water Board’s website. It is anticipated that an interactive map of sediment sensitive water bodies in California will be available in the future.

The Risk Levels have been altered by eliminating the possibility of a Risk Level 4, and expanding the constraints for Risk Levels 1, 2, and 3. Therefore, projects with high receiving water risk and high sediment risk will be considered a Risk Level 3 risk to water quality.

In response to public comments, the Risk Level requirements have also been changed such that Risk Level 1 projects will be subject to minimum BMP and visual monitoring requirements, Risk Level 2 projects will be subject to NALs and some additional monitoring requirements, and Risk Level 3 projects will be subject to NALs, and more rigorous monitoring requirements such as receiving water monitoring and in some cases bioassessment.

Table 7 - Combined Risk Level Matrix

Combined Risk Level Matrix			
Receiving Water Risk		Sediment Risk	
		Low	Medium	High
	Low	Level 1	Level 2
High	Level 2		Level 3

b. Effluent Standards

All dischargers are subject to the narrative effluent limitations specified in the General Permit. The narrative effluent limitations require storm water discharges associated with construction activity to meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize BAT and BCT to reduce pollutants and any more stringent controls necessary to meet water quality standards.

Risk Level 2 dischargers that pose a medium risk to water quality are subject to technology-based NALs for pH and turbidity. Risk Level 3 dischargers that pose a high risk to water quality are also subject to technology-based NALs for pH and turbidity.

c. Good Housekeeping

Proper handling and managing of construction materials can help minimize threats to water quality. The discharger must consider good housekeeping measures for: construction materials, waste management, vehicle storage & maintenance, landscape materials, and potential pollutant sources. Examples include; conducting an inventory of products used, implementing proper storage & containment, and properly cleaning all leaks from equipment and vehicles.

d. Non-Storm Water Management

Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.

e. Erosion Control

The best way to minimize the risk of creating erosion and sedimentation problems during construction is to disturb as little of the land surface as possible by fitting the development to the terrain. When development is tailored to the natural contours of the land, little grading is necessary and, consequently, erosion potential is lower.¹⁴ Other effective erosion control measures include: preserving existing vegetation where feasible, limiting disturbance, and stabilizing and re-vegetating disturbed areas as soon as possible after grading or construction activities. Particular attention must be paid to large, mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great and where there is potential for significant sediment discharge from the site to surface waters. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single most important factor in reducing erosion at construction sites. The discharger is required to consider measures such as: covering disturbed areas with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. These erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. Erosion control BMPs should be the primary means of preventing storm water contamination, and sediment control techniques should be used to capture any soil that becomes eroded.¹²

Risk Level 3 dischargers pose a higher risk to water quality and are therefore additionally required to ensure that post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Sediment Control

Sediment control BMPs should be the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques should be used to capture any soil that becomes eroded. The discharger is required to consider perimeter control measures such as: installing silt fences or placing straw wattles below slopes. These sediment control measures are only

¹² U.S. Environmental Protection Agency. 2007. Developing Your Storm Water Pollution Prevention Plan: A Guide for Construction Sites.

examples of what should be considered and should not preclude new or innovative approaches currently available or being developed.

Because Risk Level 2 and 3 dischargers pose a higher risk to water quality, additional requirements for the application of sediment controls are imposed on these projects. This General Permit also authorizes the Regional Water Boards to require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of other erosion or sediment controls are not adequately protecting the receiving waters.

g. Run-on and Runoff Control

Inappropriate management of run-on and runoff can result in excessive physical impacts to receiving waters from sediment and increased flows. The discharger is required to manage all run-on and runoff from a project site. Examples include: installing berms and other temporary run-on and runoff diversions.

Risk Level 1 dischargers with lower risks to impact water quality are not subject to the run-on and runoff control requirements unless an evaluation deems them necessary or visual inspections show that such controls are required.

h. Inspection, Maintenance and Repair

All measures must be periodically inspected, maintained and repaired to ensure that receiving water quality is protected. Frequent inspections coupled with thorough documentation and timely repair is necessary to ensure that all measures are functioning as intended.

i. Rain Event Action Plan (REAP)

A Rain Event Action Plan (REAP) is a written document, specific for each rain event. A REAP should be designed that when implemented it protects all exposed portions of the site within 48 hours of any likely precipitation event forecast of 50% or greater probability.

This General Permit requires Risk Level 2 and 3 dischargers to develop and implement a REAP designed to protect all exposed portions of their sites within 48 hours prior to any likely precipitation event. The REAP requirement is designed to ensure that the discharger has adequate materials, staff, and time to implement erosion and sediment control measures that are intended to reduce the amount of sediment and other pollutants generated from the active site. A REAP must be developed when there is likely a forecast of 50% or greater probability of precipitation in the project area. (The National Oceanic and Atmospheric Administration (NOAA) defines a chance of precipitation as a probability of precipitation of 30% to 50% chance of producing precipitation in the project area.¹³ NOAA defines the probability of precipitation (PoP) as the likelihood of occurrence (expressed as a percent) of a measurable amount (0.01 inch or more) of liquid precipitation (or the water equivalent of frozen precipitation) during a specified period of time at any given point in the forecast area.) Forecasts are normally issued for 12-hour time periods. Descriptive terms for uncertainty and aerial coverage are used as follows:

Table 8 -National Oceanic and Atmospheric Administration (NOAA) Definition of Probability of Precipitation (PoP)

¹³ <http://www.crh.noaa.gov/lot/severe/wxterms.php>.

PoP	Expressions of Uncertainty	Aerial Coverage
0%	none used	none used
10%	none used	isolated
20%	slight chance	isolated
30-50%	chance	scattered
60-70%	likely	numerous
80-100%	none used	none used

The discharger must obtain the precipitation forecast information from the National Weather Service Forecast Office (<http://www.srh.noaa.gov/>).

2. Linear Projects

a. Linear Risk Determination

LUPs vary in complexity and water quality concerns based on the type of project. This General Permit has varying application requirements based on the project's risk to water quality. Factors that lead to the characterization of the project include location, sediment risk, and receiving water risk.

Based on the location and complexity of a project area or project section area, LUPs are separated into project types. As described below, LUPs have been categorized into three project types.

i. *Type 1 LUPs*

Type 1 LUPs are those construction projects where:

- (1) 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day, or
- (2) greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

Areas disturbed during construction will be returned to pre-construction conditions or equivalent protection established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization Best Management Practices (BMPs) will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

Type 1 LUPs typically do not have a high potential to impact storm water quality because (1) these construction activities are not typically conducted during a rain event, (2) these projects are normally constructed over a short period of time¹⁴, minimizing the duration that pollutants could potentially be exposed to rainfall; and (3) disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.

Type 1 LUPs are determined during the risk assessment found in Attachment A.1 to be 1) low sediment risk and low receiving water risk; 2) low sediment risk and medium receiving water risk; and 3) medium sediment risk and low receiving water risk.

This General Permit requires the discharger to ensure a SWPPP is developed for these construction activities that is specific to project type, location and characteristics.

ii. Type 2 LUPs:

Type 2 projects are determined to have a combination of High, Medium, and Low project sediment risk along with High, Medium, and Low receiving water risk. Like Type 1 projects, Type 2 projects are typically constructed over a short period of time. However, these projects have a higher potential to impact water quality because they:

- (1) typically occur outside the more urban/developed areas;
- (2) have larger areas of soil disturbance that are not closed or restored at the end of the day;
- (3) may have onsite stockpiles of soil, spoil and other materials;
- (4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and
- (5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location and characteristics.

iii. Type 3 LUPs:

¹⁴ Short period of time refers to a project duration of weeks to months, but typically less than one year in duration.

Type 3 projects are determined to have a combination of High and Medium project sediment risk along with High and Medium receiving water risk. Similar to Type 2 projects, Type 3 projects have a higher potential to impact water quality because they:

- (1) typically occur outside of the more urban/developed areas;
- (2) have larger areas of soil disturbance that are not closed or restored at the end of the day;
- (3) may have onsite stockpiles of soil, spoil and other materials;
- (4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and
- (5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location, and characteristics.

b. Linear Effluent Standards

All LUPs are subject to the narrative effluent limitations specified in the General Permit.

Type 2 and Type 3 projects are subject to technology-based NALs for pH and turbidity.

c. Linear Good Housekeeping

Improper use and handling of construction materials could potentially cause a threat to water quality. In order to ensure proper site management of these construction materials, all LUP dischargers must comply with a minimum set of Good Housekeeping measures specified in Attachment A of this General Permit.

d. Linear Non-Storm Water Management

In order to ensure control of all non-storm water discharges during construction, all LUP dischargers must comply with the Non-Storm Water Management measures specified in Attachment A of this General Permit.

e. Linear Erosion Control

This General Permit requires all LUP dischargers to implement effective wind erosion control measures, and soil cover for inactive areas. Type 3 LUPs posing a higher risk to water quality are additionally required to ensure the post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Linear Sediment Control

In order to ensure control and containment of all sediment discharges, all LUP dischargers must comply with the general Sediment Control measures specified in Attachment A or this General Permit. Additional requirements for sediment controls are imposed on Type 2 & 3 LUPs due to their higher risk to water quality.

g. Linear Run-on and Runoff Control

Discharges originating outside of a project's perimeter and flowing onto the property can adversely affect the quantity and quality of discharges originating from a project site. In order to ensure proper management of run-on and runoff, all LUPs must comply with the run-on and runoff control measures specified in Attachment A of this General Permit. Due to the lower risk of impacting water quality, Type 1 LUPs are not required to implement run-on and runoff controls unless deemed necessary by the discharger.

h. Linear Inspection, Maintenance and Repair

Proper inspection, maintenance, and repair activities are important to ensure the effectiveness of on-site measures to control water quality. In order to ensure that inspection, maintenance, and repair activities are adequately performed, the all LUP dischargers are required to comply with the Inspection, Maintenance, and Repair requirements specified in Attachment A of this General Permit.

K. ATS¹⁵ Requirements

There are instances on construction sites where traditional erosion and sediment controls do not effectively control accelerated erosion. Under such circumstances, or under circumstances where storm water discharges leaving the site may cause or contribute to an exceedance of a water quality standard, the use of an Active Treatment System (ATS) may be necessary. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.¹⁶

Although treatment systems have been in use in some form since the mid-1990s, the ATS industry in California is relatively young, and detailed regulatory standards have not yet been developed. Many developers are using these systems to treat storm water discharges from their construction sites. The new ATS requirements set forth in this General Permit are based on those in place for small wastewater treatment systems, ATS regulations from the Central Valley Regional Water Quality Control Board (September 2005 memorandum "2005/2006 Rainy Season – Monitoring Requirements for Storm Water Treatment Systems that Utilize Chemical Additives to Enhance Sedimentation"), the Construction Storm Water Program at the State of Washington's Department of Ecology, as well as recent advances in technology and knowledge of coagulant performance and aquatic safety.

The effective design of an ATS requires a detailed survey and analysis of site conditions. With proper planning, ATS performance can provide exceptional water quality discharge and prevent significant impacts to surface water quality, even under extreme environmental conditions.

These systems can be very effective in reducing the sediment in storm water runoff, but the systems that use additives/polymers to enhance sedimentation also pose a potential risk to water quality (e.g., operational failure, equipment failure, additive/polymer release, etc.). The State Water Board is concerned about the potential acute and chronic impacts that the polymers and other chemical additives may have on fish and aquatic organisms if released in sufficient quantities or concentrations. In addition

¹⁵ An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation in order to reduce turbidity caused by fine suspended sediment.

¹⁶ Pitt, R., S. Clark, and D. Lake. 2006. Construction Site Erosion and Sediment Controls: Planning, Design, and Performance. DEStech Publications. Lancaster, PA. 370pp.

to anecdotal evidence of polymer releases causing aquatic toxicity in California, the literature supports this concern.¹⁷ For example, cationic polymers have been shown to bind with the negatively charged gills of fish, resulting in mechanical suffocation.¹⁸ Due to the potential toxicity impacts, which may be caused by the release of additives/polymers into receiving waters, this General Permit establishes residual polymer monitoring and toxicity testing requirements have been established in this General Permit for discharges from construction sites that utilize an ATS in order to protect receiving water quality and beneficial uses.

The primary treatment process in an ATS is coagulation/flocculation. ATS's operate on the principle that the added coagulant is bound to suspended sediment, forming floc, which is gravitationally settled in tanks or a basin, or removed by sand filters. A typical installation utilizes an injection pump upstream from the clarifier tank, basin, or sand filters, which is electronically metered to both flow rate and suspended solids level of the influent, assuring a constant dose. The coagulant mixes and reacts with the influent, forming a dense floc. The floc may be removed by gravitational setting in a clarifier tank or basin, or by filtration. Water from the clarifier tank, basin, or sand filters may be routed through cartridge(s) and/or bag filters for final polishing. Vendor-specific systems use various methods of dose control, sediment/floc removal, filtration, etc., that are detailed in project-specific documentation. The particular coagulant/flocculant to be used for a given project is determined based on the water chemistry of the site because the coagulants are specific in their reactions with various types of sediments. Appropriate selection of dosage must be carefully matched to the characteristics of each site.

ATS's are operated in two differing modes, either Batch or Flow-Through. Batch treatment can be defined as Pump-Treat-Hold-Test-Release. In Batch treatment, water is held in a basin or tank, and is not discharged until treatment is complete. Batch treatment involves holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full. In Flow-Through treatment, water is pumped into the ATS directly from the runoff collection system or storm water holding pond, where it is treated and filtered as it flows through the system, and is then directly discharged. "Flow-Through Treatment" is also referred to as "Continuous Treatment."

1. Effluent Standards

This General Permit establishes NELs for discharges from construction sites that utilize an ATS. These systems lend themselves to NELs for turbidity and pH because of their known reliable treatment. Advanced systems have been in use in some form since the mid-1990s. An ATS is considered reliable, can consistently produce a discharge of less than 10 NTU, and has been used successfully at many sites in several states since 1995 to reduce turbidity to very low levels.¹⁹

This General Permit contains "compliance storm event" exceptions from the technology-based NELs for ATS discharges. The rationale is that technology-based requirements are developed assuming a certain design storm. In the case of ATS the industry-standard design storm is 10-year, 24-hour (as stated in

¹⁷ Romøen, K., B. Thu, and Ø. Evensen. 2002. Immersion delivery of plasmid DNA II. A study of the potentials of a chitosan based delivery system in rainbow trout (*Oncorhynchus mykiss*) fry. *Journal of Controlled Release* **85**: 215-225.

¹⁸ Bullock, G., V. Blazer, S. Tsukuda, and S. Summerfelt. 2000. Toxicity of acidified chitosan for cultured rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* **185**:273-280.

¹⁹ Currier, B., G. Minton, R. Pitt, L. Roesner, K. Schiff, M. Stenstrom, E. Strassler, and E. Strecker. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.

Attachment F of this General Permit), so the compliance storm event has been established as the 10-year 24-hour event as well to provide consistency.

2. Training

Operator training is critical to the safe and efficient operation and maintenance of the ATS, and to ensure that all State Water Board monitoring and sampling requirements are met. The General Permit requires that all ATS operators have training specific to using ATS's liquid coagulants.

L. Post-Construction Requirements

Under past practices, new and redevelopment construction activities have resulted in modified natural watershed and stream processes. This is caused by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, increasing drainage density through pipes and channels, and altering the condition of stream channels through straightening, deepening, and armoring. These changes result in a drainage system where sediment transport capacity is increased and sediment supply is decreased. A receiving channel's response is dependent on dominant channel materials and its stage of adjustment.

Construction activity can lead to impairment of beneficial uses in two main ways. First, during the actual construction process, storm water discharges can negatively affect the chemical, biological, and physical properties of downstream receiving waters. Due to the disturbance of the landscape, the most likely pollutant is sediment, however pH and other non-visible pollutants are also of great concern. Second, after most construction activities are completed at a construction site, the finished project may result in significant modification of the site's response to precipitation. New development and redevelopment projects have almost always resulted in permanent post-construction water quality impacts because more precipitation ends up as runoff and less precipitation is intercepted, evapotranspired, and infiltrated.

General Permit 99-08-DWQ required the SWPPP to include a description of all post-construction BMPs on a site and a maintenance schedule. An effective storm water management strategy must address the full suite of storm events (water quality, channel protection, overbank flood protection, extreme flood protection) (Figure 2).

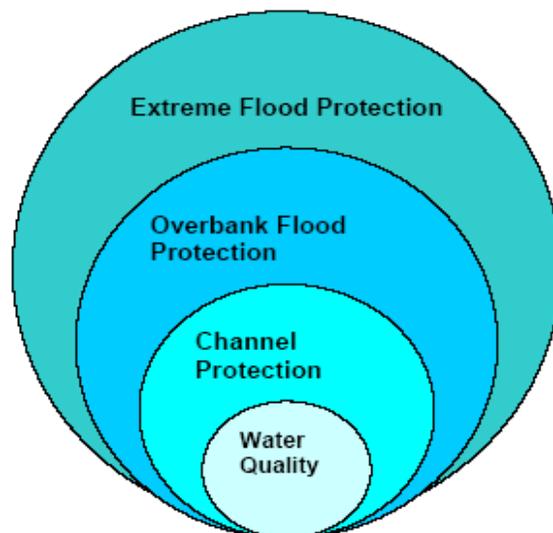


Figure 2 - Suite of Storm Events

The post-construction storm water performance standards in this General Permit specifically address water quality and channel protection events. Overbank flood protection and extreme flood protection events are traditionally dealt with in local drainage and flood protection ordinances. However, measures in this General Permit to address water quality and channel protection also reduce overbank and extreme flooding impacts. This General Permit aims to match post-construction runoff to pre-construction runoff for the 85th percentile storm event, which not only reduces the risk of impact to the receiving water's channel morphology but also provides some protection of water quality.

This General Permit clarifies that its runoff reduction requirements only apply to projects that lie outside of jurisdictions covered by a Standard Urban Storm water Management Plan (SUSMP) (or other more protective) post-construction requirements in either Phase I or Phase II permits.

Figures 3 and 4, below, show the General Permit enrollees (to Order 99-08-DWQ, as of March 10, 2008) overlaid upon a map with SUSMP (or more protective) areas in blue and purple. Areas without blue or purple indicate where the General Permit's runoff reduction requirements would actually apply.

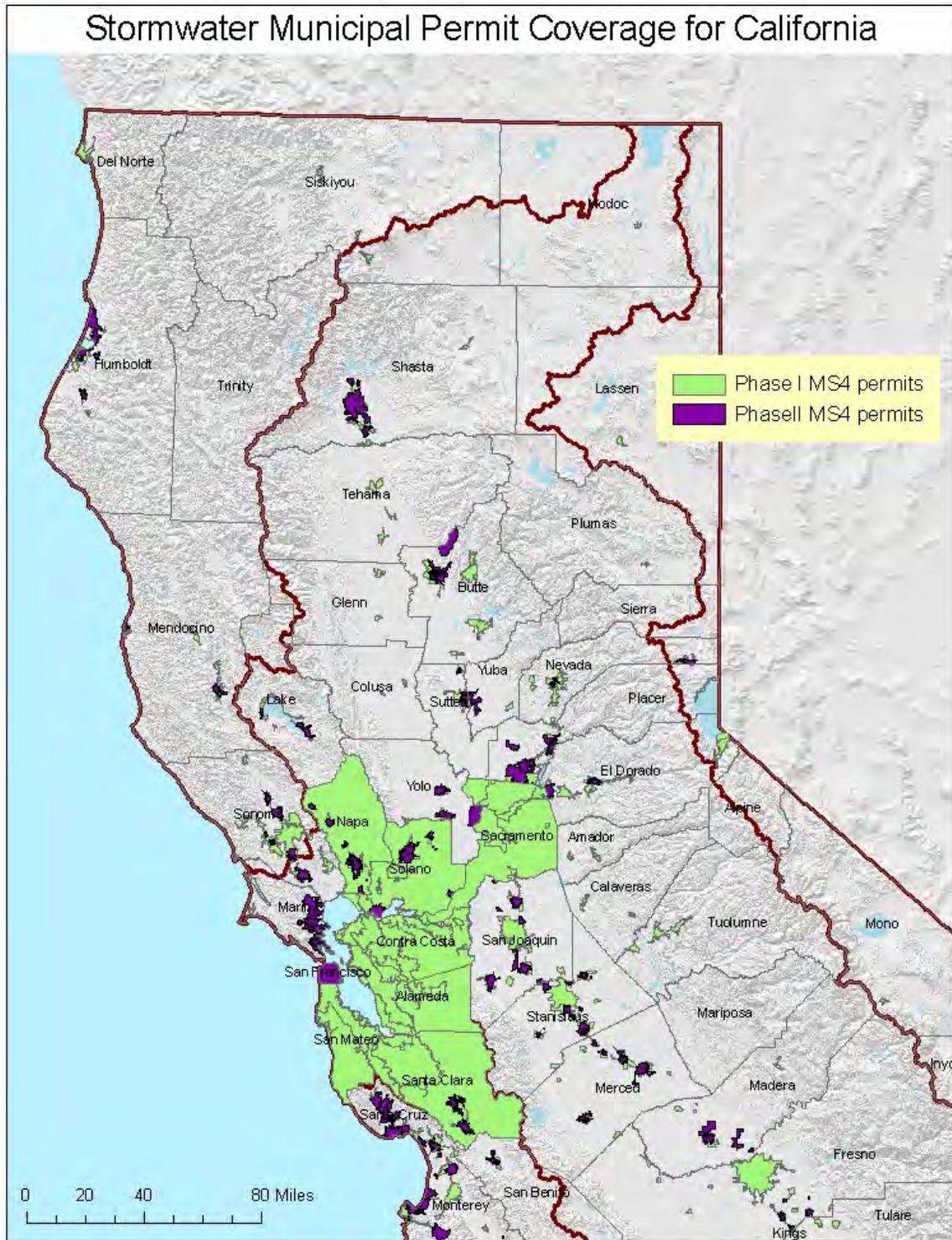


Figure 3 - Northern CA (2009) Counties / Cities With SUSMP-Plus Coverage



Figure 4 - Southern CA (2009) Counties / Cities With SUSMP-Plus Coverage

Water Quality:

This General Permit requires dischargers to replicate the pre-project runoff water balance (defined as the amount of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event, or the smallest storm event that generates runoff, whichever is larger. Contemporary storm water management generally routes these flows directly to the drainage system, increasing pollutant loads and potentially causing adverse effects on receiving waters. These smaller water quality events happen much more frequently than larger events and generate much higher pollutant loads on an annual basis. There are other adverse hydrological impacts that result from not designing according to the site's pre-construction water balance. In Maryland, Klein²⁰ noted that baseflow decreases as the extent of urbanization increases. Ferguson and Suckling²¹ noted a similar relation in watersheds in Georgia. On Long Island, Spinello and Simmons²² noted substantial decreases in base flow in intensely urbanized watersheds.

The permit emphasizes runoff reduction through on-site storm water reuse, interception, evapotranspiration and infiltration through non-structural controls and conservation design measures (e.g., downspout disconnection, soil quality preservation/enhancement, interceptor trees). Employing these measures close to the source of runoff generation is the easiest and most cost-effective way to comply with the pre-construction water balance standard. Using low-tech runoff reduction techniques close to the source is consistent with a number of recommendations in the literature.²³ In many cases, BMPs implemented close to the source of runoff generation cost less than end-of the pipe measures.²⁴ Dischargers are given the option of using Appendix 2 to calculate the required runoff volume or a watershed process-based, continuous simulation model such as the EPA's Storm Water Management Model (SWMM) or Hydrologic Simulation Program Fortran (HSPF). Such methods used by the discharger will be reviewed by the Regional Water Board upon NOT application.

Channel Protection:

In order to address channel protection, a basic understanding of fluvial geomorphic concepts is necessary. A dominant paradigm in fluvial geomorphology holds that streams adjust their channel dimensions (width and depth) in response to long-term changes in sediment supply and bankfull discharge (1.5 to 2 year recurrence interval). The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which the moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of channels.²⁵ Lane (1955 as cited in Rosgen 1996²⁶) showed the generalized relationship between sediment load, sediment size, stream discharge and stream slope in

²⁰ Klein 1979 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.

²¹ Ferguson and Suckling 1990 as cited Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.

²² Center for Watershed Protection (CWP). 2000. The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers, and estuaries. Ellicott City, MD. 741 pp.

²³ Bay Area Storm Water Management Agencies Association (BASMAA). 1997. Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality Protection. Palo Alto, CA;

McCuen, R.H. 2003 Smart Growth: hydrologic perspective. Journal of Professional Issues in Engineering Education and Practice. Vol (129), pp.151-154;

Moglen, G.E. and S. Kim. 2007. Impervious imperviousness-are threshold based policies a good idea? Journal of the American Planning Association, Vol 73 No. 2. pp 161-171.

²⁴ Delaware Department of natural Resources (DDNR). 2004. Green technology: The Delaware urban Runoff Management Approach. Dover, DE. 117 pp.

²⁵ Dunne, T and L.B. Leopold. 1978. Water in Environmental Planning. San Francisco W.H. Freeman and Company

²⁶ Rosgen. D.L. 1996. Applied River Morphology. Pagosa Springs. Wildland Hydrology

Figure 5. A change in any one of these variables sets up a series of mutual adjustments in the companion variables with a resulting direct change in the physical characteristics of the stream channel.

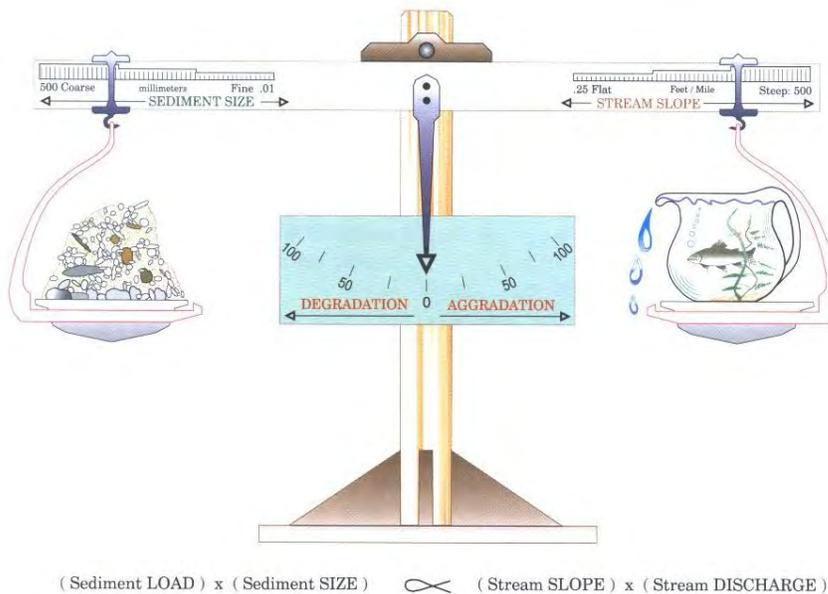


Figure 5 - Schematic of the Lane Relationship
After Lane (1955) as cited in Rosgen (1996)

Stream slope multiplied by stream discharge (the right side of the scale) is essentially an approximation of stream power, a unifying concept in fluvial geomorphology (Bledsoe 1999). Urbanization generally increases stream power and affects the resisting forces in a channel (sediment load and sediment size represented on the left side of the scale).

During construction, sediment loads can increase from 2 to 40,000 times over pre-construction levels.²⁷ Most of this sediment is delivered to stream channels during large, episodic rain events.²⁸ This increased sediment load leads to an initial aggradation phase where stream depths may decrease as sediment fills the channel, leading to a decrease in channel capacity and increase in flooding and overbank deposition. A degradation phase initiates after construction is completed.

Schumm et. al (1984) developed a channel evolution model that describes the series of adjustments from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 6).

²⁷ Goldman S.J., K. Jackson, and T.A. Bursztynsky. 1986. Erosion and Sediment Control Handbook. McGraw Hill. San Francisco.

²⁸ Wolman 1967 as cited in Paul, M.P. and J.L. Meyer. 2001. Streams in the Urban Landscape. *Annu. Rev.Ecol. Syst.* 32: 333-365.

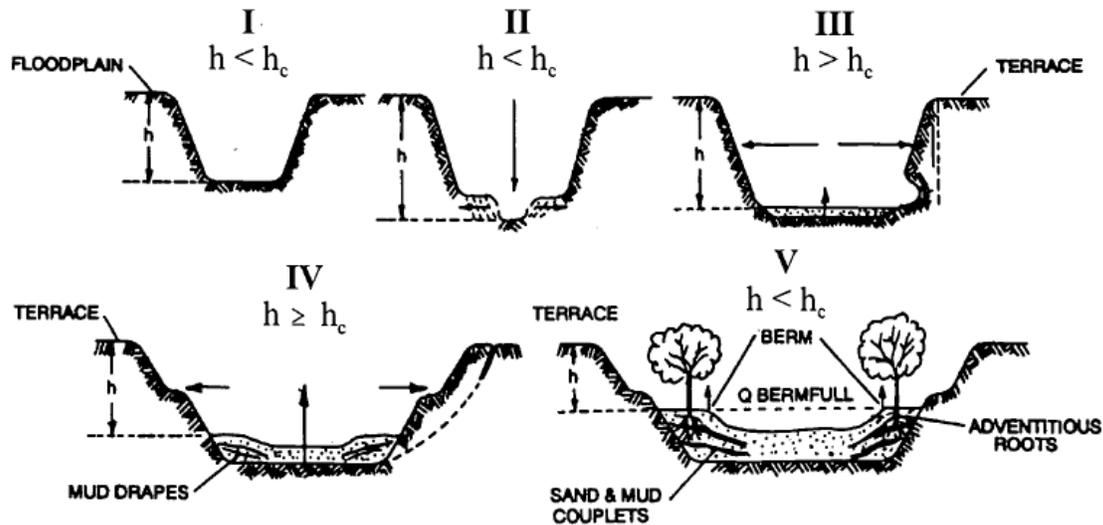


Figure 6 - Channel Changes Associated with Urbanization

After Incised Channel Evolution Sequence in Schumm et. al 1984

Channel incision (Stage II) and widening (Stages III and to a lesser degree, Stage IV) are due to a number of fundamental changes on the landscape. Connected impervious area and compaction of pervious surfaces increase the frequency and volume of bankfull discharges.²⁹ Increased drainage density (miles of stream length per square mile of watershed) also negatively impacts receiving stream channels.³⁰ Increased drainage density and hydraulic efficiency leads to an increase in the frequency and volume of bankfull discharges because the time of concentration is shortened. Flows from engineered pipes and channels are also often “sediment starved” and seek to replenish their sediment supply from the channel.

Encroachment of stream channels can also lead to an increase in stream slope, which leads to an increase in stream power. In addition, watershed sediment loads and sediment size (with size generally represented as the median bed and bank particle size, or d_{50}) decrease during urbanization.³¹ This means

²⁹ Booth, D. B. and C. R. Jackson. 1997. Urbanization of Aquatic Systems: Degradation Thresholds, Storm Water Detection, and the Limits of Mitigation. *Journal of the American Water Resources Association* Vol. 33, No.5, pp. 1077-1089.

³⁰ May, C.W. 1998. Cumulative effects of urbanization on small streams in the Puget Sound Lowland ecoregion. Conference proceedings from Puget Sound Research '98 held March 12, 13 1998 in Seattle, WA;

Santa Clara Valley Urban Runoff Pollution Prevention Program. 2002. Hydromodification Management Plan Literature Review. 80 pp.

³¹ Finkenbine, J.K., D.S. Atwater, and D.S. Mavinic. 2000. Stream health after urbanization. *J. Am. Water Resour. Assoc.* 36:1149-60;

that even if pre- and post-development stream power are the same, more erosion will occur in the post-development stage because the smaller particles are less resistant (provided they are non-cohesive).

As shown in Stages II and III, the channel deepens and widens to accommodate the increased stream power³² and decrease in sediment load and sediment size. Channels may actually narrow as entrained sediment from incision is deposited laterally in the channel. After incised channels begin to migrate laterally (Stage III), bank erosion begins, which leads to general channel widening.³³ At this point, a majority of the sediment that leaves a drainage area comes from within the channel, as opposed to the background and construction related hillslope contribution. Stage IV is characterized by more aggradation and localized bank instability. Stage V represents a new quasi-equilibrium channel morphology in balance with the new flow and sediment supply regime. In other words, stream power is in balance with sediment load and sediment size.

The magnitude of the channel morphology changes discussed above varies along a stream network as well as with the age of development, slope, geology (sand-bedded channels may cycle through the evolution sequence in a matter of decades whereas clay-dominated channels may take much longer), watershed sediment load and size, type of urbanization, and land use history. It is also dependent on a channel's stage in the channel evolution sequence when urbanization occurs. Management strategies

Pizzuto, J.E. W.S. Hession, and M. McBride. 2000. Comparing gravel-bed rivers in paired urban and rural catchments of southeastern Pennsylvania. *Geology* 28:79-82.

³² Hammer 1973 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp;

Booth, D.B. 1990. Stream Channel Incision Following Drainage Basin Urbanization. *Water Resour. Bull.* 26:407-417.

³³ Trimble, S.W. 1997. Contribution of Stream Channel Erosion to Sediment Yield from an Urbanizing Watershed. *Science*: Vol. 278 (21), pp. 1442-1444.

must take into account a channel's stage of adjustment and account for future changes in the evolution of channel form (Stein and Zaleski 2005).³⁴

Traditional structural water quality BMPs (e.g. detention basins and other devices used to store volumes of runoff) unless they are highly engineered to provide adequate flow duration control, do not adequately protect receiving waters from accelerated channel bed and bank erosion, do not address post-development increases in runoff volume, and do not mitigate the decline in benthic macroinvertebrate communities in the receiving waters³⁵ suggest that structural BMPs are not as effective in protecting aquatic communities as a continuous riparian buffer of native vegetation. This is supported by the findings of Zucker and White³⁶, where instream biological metrics were correlated with the extent of forested buffers.

This General Permit requires dischargers to maintain pre-development drainage densities and times of concentration in order to protect channels and encourages dischargers to implement setbacks to reduce channel slope and velocity changes that can lead to aquatic habitat degradation.

There are a number of other approaches for modeling fluvial systems, including statistical and physical models and simpler stream power models.³⁷ The use of these models in California is described in Stein and Zaleski (2005).³⁸ Rather than prescribe a specific one-size-fits-all modeling method in this permit, the State Water Board intends to develop a stream power and channel evolution model-based framework to assess channels and develop a hierarchy of suitable analysis methods and management strategies. In time, this framework may become a State Water Board water quality control policy.

Permit Linkage to Overbank and Extreme Flood Protection

Site design BMPs (e.g. rooftop and impervious disconnection, vegetated swales, setbacks and buffers) filter and settle out pollutants and provide for more infiltration than is possible for traditional centralized structural BMPs placed at the lowest point in a site. They provide source control for runoff and lead to a reduction in pollutant loads. When implemented, they also help reduce the magnitude and volume of larger, less frequent storm events (e.g., 10-yr, 24-hour storm and larger), thereby reducing the need for expensive flood control infrastructure. Nonstructural BMPs can also be a landscape amenity, instead of a large isolated structure requiring substantial area for ancillary access, buffering, screening and maintenance facilities.²⁵ The multiple benefits of using non-structural benefits will be critically important as the state's population increases and imposes strains upon our existing water resources.

Maintaining predevelopment drainage densities and times of concentration will help reduce post-development peak flows and volumes in areas not covered under a municipal permit. The most effective way to preserve drainage areas and maximize time of concentration is to implement landform grading,

³⁴ Stein, E.S. and S. Zaleski. 2005. Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

³⁵ Horner, R.R. 2006. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (LID) for the San Diego Region. Available at: http://www.projectcleanwater.org/pdf/permit/case-study_lid.pdf.

³⁶ Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.

³⁷ Finlayson, D.P. and D.R. Montgomery. 2003. Modeling large-scale fluvial erosion in geographic information systems. *Geomorphology* (53), pp. 147-164).

³⁸ Stein, E.S. and S. Zaleski. 2005. Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

incorporate site design BMPs and implement distributed structural BMPs (e.g., bioretention cells, rain gardens, rain cisterns).

M. Storm Water Pollution Prevention Plans

USEPA's Construction General Permit requires that qualified personnel conduct inspections. USEPA defines qualified personnel as "a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity."³⁹ USEPA also suggests that qualified personnel prepare SWPPPs and points to numerous states that require certified professionals to be on construction sites at all times. States that currently have certification programs are Washington, Georgia, Florida, Delaware, Maryland, and New Jersey. The Permit 99-08-DWQ did not require that qualified personnel prepare SWPPPs or conduct inspections. However, to ensure that water quality is being protected, this General Permit requires that all SWPPPs be written, amended, and certified by a Qualified SWPPP Developer. A Qualified SWPPP Developer must possess one of the eight certifications and or registrations specified in this General Permit and effective two years after the adoption date of this General Permit, must have attended a State Water Board-sponsored or approved Qualified SWPPP Developer training course. Table 9 provides an overview of the criteria used in determining qualified certification titles for a QSD and QSP.

39 US Environmental Protection Agency. Stormwater Pollution Prevention Plans for Construction Activities. <<http://cfpub.epa.gov/npdes/stormwater/swppp.cfm>> and <http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf>.

Table 9 - Qualified SWPPP Developer/ Qualified SWPPP Practitioner Certification Criteria

Certification/ Title	Registered By	QSD/QSP	Certification Criteria
Professional Civil Engineer	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Geologist or Engineering Geologist	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Landscape Architect	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Hydrologist	American Institute of Hydrology	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Certified Professional in Erosion and Sediment Control™ (CPESC)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Inspector of Sediment and Erosion Control™ (CISEC)	Certified Inspector of Sediment and Erosion Control, Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Erosion, Sediment and Storm Water Inspector™ (CESSWI)	Enviro Cert International Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Professional in Storm Water Quality™ (CPSWQ)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education

The previous versions of the General Permit required development and implementation of a SWPPP as the primary compliance mechanism. The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in storm water and non-storm water discharges. The SWPPP must include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control.

This General Permit shifts some of the measures that were covered by this general requirement to specific permit requirements, each individually enforceable as a permit term. This General Permit emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs. This approach provides the flexibility necessary to establish BMPs that can effectively address source control of pollutants during changing construction activities. These specific requirements also improve both the clarity and the enforceability of the General Permit so that the dischargers understand, and the public can determine whether the discharges are in compliance with, permit requirements.

The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The SWPPP must remain on the site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the General Permit. For LUPs the discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio or telephone. Once construction activities are complete, until stabilization is achieved, the SWPPP shall be available from the SWPPP contact listed in the PRDs

A SWPPP must be appropriate for the type and complexity of a project and will be developed and implemented to address project specific conditions. Some projects may have similarities or complexities, yet each project is unique in its progressive state that requires specific description and selection of BMPs needed to address all possible generated pollutants

N. Regional Water Board Authorities

Because this General Permit will be issued to thousands of construction sites across the State, the Regional Water Boards retain discretionary authority over certain issues that may arise from the discharges in their respective regions. This General Permit does not grant the Regional Water Boards any authority they do not otherwise have; rather, it merely emphasizes that the Regional Water Boards can take specific actions related to this General Permit. For example, the Regional Water Boards will be enforcing this General Permit and may need to adjust some requirements for a discharger based on the discharger's compliance history.



Linda S. Adams
Secretary for
Environmental Protection

State Water Resources Control Board



Arnold Schwarzenegger
Governor

Division of Water Quality

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE
ACTIVITIES

ORDER NO. 2009-0009-DWQ
NPDES NO. **CAS000002**

This Order was adopted by the State Water Resources Control Board on:	September 2, 2009
This Order shall become effective on:	July 1, 2010
This Order shall expire on:	September 2, 2014

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ [as amended by Order No. 2010-0014-DWQ] except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend
Clerk to the Board



Linda S. Adams
Secretary for
Environmental Protection

State Water Resources Control Board



Arnold Schwarzenegger
Governor

Division of Water Quality

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

**ORDER NO. 2010-0014-DWQ
NPDES NO. CAS000002**

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	September 2, 2009
Order No. 2009-0009-DWQ became effective on:	July 1, 2010
Order No. 2009-0009-DWQ shall expire on:	September 2, 2014
This Order, which amends Order No. 2009-0009-DWQ, was adopted by the State Water Resources Control Board on:	November 16, 2010
This Order shall become effective on:	February 14, 2011

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in [blue-underline](#) text and deletions are reflected in ~~red-strikeout~~ text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-0009-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **November 16, 2010**.

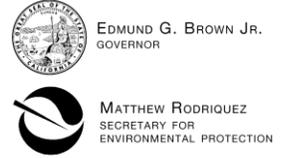
AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend
Clerk to the Board



State Water Resources Control Board

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2012-0006-DWQ
NPDES NO. CAS000002

Table with 2 columns: Description of order changes and Effective dates. Rows include adoption of 2009-0009-DWQ, effectiveness of 2009-0009-DWQ, effectiveness of 2010-0014-DWQ, expiration of 2009-0009-DWQ as amended, adoption of the current order, and effectiveness of the current order.

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-000-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on July 17, 2012.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None

Handwritten signature of Jeanine Townsend
Jeanine Townsend
Clerk to the Board

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**STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2009-0009-DWQ
[AS AMENDED BY ORDER NO. 2010-0014-DWQ]
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT NO. CAS000002**

**WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH
CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES**

I. FINDINGS

A. General Findings

The State Water Resources Control Board (State Water Board) finds that:

1. The federal Clean Water Act (CWA) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Title 33 United States Code (U.S.C.) §§ 1311 and 1342(p); also referred to as Clean Water Act (CWA) §§ 301 and 402(p)). The U.S. Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the CWA's mandate to control pollutants in storm water runoff discharges. (Title 40 Code of Federal Regulations (C.F.R.) Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale), to obtain coverage under an NPDES permit. The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate pollutants in storm water runoff. The NPDES permit must also include additional requirements necessary to implement applicable water quality standards.
2. This General Permit authorizes discharges of storm water associated with construction activity so long as the dischargers comply with all requirements, provisions, limitations and prohibitions in the permit. In addition, this General Permit regulates the discharges of storm water associated with construction activities from all Linear

Underground/Overhead Projects resulting in the disturbance of greater than or equal to one acre (Attachment A).

3. This General Permit regulates discharges of pollutants in storm water associated with construction activity (storm water discharges) to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.
4. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems or other watercourses within their jurisdictions.
5. This action to adopt a general NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), pursuant to Section 13389 of the California Water Code.
6. Pursuant to 40 C.F.R. § 131.12 and State Water Board [Resolution No. 68-16](#),¹ which incorporates the requirements of § 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality standards, and are therefore consistent with those provisions. Compliance with this General Permit will result in improvements in water quality.
7. This General Permit serves as an NPDES permit in compliance with CWA § 402 and will take effect on July 1, 2010 by the State Water Board provided the Regional Administrator of the U.S. EPA has no objection. If the U.S. EPA Regional Administrator objects to its issuance, the General Permit will not become effective until such objection is withdrawn.
8. Following adoption and upon the effective date of this General Permit, the Regional Water Quality Control Boards (Regional Water Boards) shall enforce the provisions herein.
9. Regional Water Boards establish water quality standards in Basin Plans. The State Water Board establishes water quality standards in various statewide plans, including the California Ocean Plan. U.S. EPA establishes water quality standards in the National Toxic Rule (NTR) and the California Toxic Rule (CTR).

¹ Resolution No. 68-16 generally requires that existing water quality be maintained unless degradation is justified based on specific findings.

10. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.
11. The primary storm water pollutant at construction sites is excess sediment. Excess sediment can cloud the water, which reduces the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and greases.
12. Construction activities can impact a construction site's runoff sediment supply and transport characteristics. These modifications, which can occur both during and after the construction phase, are a significant cause of degradation of the beneficial uses established for water bodies in California. Dischargers can avoid these effects through better construction site design and activity practices.
13. This General Permit recognizes four distinct phases of construction activities. The phases are Grading and Land Development Phase, Streets and Utilities Phase, Vertical Construction Phase, and Final Landscaping and Site Stabilization Phase. Each phase has activities that can result in different water quality effects from different water quality pollutants. This General Permit also recognizes inactive construction as a category of construction site type.
14. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable requirements.
15. Following public notice in accordance with State and Federal laws and regulations, the State Water Board heard and considered all comments and testimony in a public hearing on 06/03/2009. The State Water Board has prepared written responses to all significant comments.
16. Construction activities obtaining coverage under the General Permit may have multiple discharges subject to requirements that are specific to general, linear, and/or active treatment system discharge types.
17. The State Water Board may reopen the permit if the U.S. EPA adopts a final effluent limitation guideline for construction activities.

B. Activities Covered Under the General Permit

18. Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.
19. Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
20. Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to U.S. EPA regulations, such as dairy barns or food processing facilities.
21. Construction activity associated with Linear Underground/Overhead Utility Projects (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.
22. Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.²
23. Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction sites that intend to disturb one or more acres of land within the jurisdictional boundaries of

² Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the U.S. EPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the site.

C. Activities Not Covered Under the General Permit

24. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.
25. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.
26. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.
27. Construction activity and land disturbance involving discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction sites in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit.
28. Construction activity that disturbs less than one acre of land surface, and that is not part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
29. Construction activity covered by an individual NPDES Permit for storm water discharges.
30. Discharges from small (1 to 5 acre) construction activities with an approved Rainfall Erosivity Waiver authorized by U.S. EPA Phase II regulations certifying to the State Board that small construction activity will occur only when the Rainfall Erosivity Factor is less than 5 ("R" in the Revised Universal Soil Loss Equation).
31. Landfill construction activity that is subject to the Industrial General Permit.
32. Construction activity that discharges to Combined Sewer Systems.
33. Conveyances that discharge storm water runoff combined with municipal sewage.
34. Discharges of storm water identified in CWA § 402(l)(2), 33 U.S.C. § 1342(l)(2).

35. Discharges occurring in basins that are not tributary or hydrologically connected to waters of the United States (for more information contact your Regional Water Board).

D. Obtaining and Modifying General Permit Coverage

36. This General Permit requires all dischargers to electronically file all Permit Registration Documents (PRDs), Notices of Termination (NOT), changes of information, annual reporting, and other compliance documents required by this General Permit through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.
37. Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.
38. This General Permit grants an exception from the Risk Determination requirements for existing sites covered under Water Quality Orders No. 99-08-DWQ, and [No. 2003-0007-DWQ](#). For certain sites, adding additional requirements may not be cost effective. Construction sites covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at the Risk Level 1. LUPs covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage as a Type 1 LUP. The Regional Water Boards have the authority to require Risk Determination to be performed on sites currently covered under Water Quality Orders No. 99-08-DWQ and No. 2003-0007-DWQ where they deem it necessary. The State Water Board finds that there are two circumstances when it may be appropriate for the Regional Water Boards to require a discharger that had filed an NOI under State Water Board Order No. 99-08-DWQ to recalculate the site's risk level. These circumstances are: (1) when the discharger has a demonstrated history of noncompliance with State Water Board Order No. 99-08-DWQ or; (2) when the discharger's site poses a significant risk of causing or contributing to an exceedance of a water quality standard without the implementation of the additional Risk Level 2 or 3 requirements.

E. Prohibitions

39. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit. Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may

contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural Best Management Practices (BMPs)³. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction.

40. This General Permit prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
41. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State Water Board and the nine Regional Water Boards.
42. Pursuant to the Ocean Plan, discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.
43. This General Permit prohibits the discharge of any debris⁴ from construction sites. Plastic and other trash materials can cause negative impacts to receiving water beneficial uses. The State Water Board encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality.

F. Training

44. In order to improve compliance with and to maintain consistent enforcement of this General Permit, all dischargers are required to appoint two positions - the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP) - who must obtain appropriate training. Together with the key stakeholders, the State and Regional Water Boards are leading the development of this curriculum through a collaborative organization called The Construction General Permit (CGP) Training Team.
45. The Professional Engineers Act (Bus. & Prof. Code section 6700, et seq.) requires that all engineering work must be performed by a California licensed engineer.

³ BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

⁴ Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

G. Determining and Reducing Risk

46. The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type.
47. This General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. This General Permit contains requirements for Risk Levels 1, 2 and 3, and LUP Risk Type 1, 2, and 3 (Attachment A). Risk levels are established by determining two factors: first, calculating the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e. grading and site stabilization). Both factors are used to determine the site-specific Risk Level(s). LUPs can be determined to be Type 1 based on the flowchart in Attachment A.1.
48. Although this General Permit does not mandate specific setback distances, dischargers are encouraged to set back their construction activities from streams and wetlands whenever feasible to reduce the risk of impacting water quality (e.g., natural stream stability and habitat function). Because there is a reduced risk to receiving waters when setbacks are used, this General Permit gives credit to setbacks in the risk determination and post-construction storm water performance standards. The risk calculation and runoff reduction mechanisms in this General Permit are expected to facilitate compliance with any Regional Water Board and local agency setback requirements, and to encourage voluntary setbacks wherever practicable.
49. Rain events can occur at any time of the year in California. Therefore, a Rain Event Action Plan (REAP) is necessary for Risk Level 2 and 3 traditional construction projects (LUPs exempt) to ensure that active construction sites have adequate erosion and sediment controls implemented prior to the onset of a storm event, even if construction is planned only during the dry season.
50. Soil particles smaller than 0.02 millimeters (mm) (i.e., finer than medium silt) do not settle easily using conventional measures for sediment control (i.e., sediment basins). Given their long settling time, dislodging these soils results in a significant risk that fine particles will be released into surface waters and cause unacceptable downstream impacts. If operated correctly, an Active Treatment System (ATS⁵) can prevent or reduce the release of fine particles from construction sites.

⁵ An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.

Use of an ATS can effectively reduce a site's risk of impacting receiving waters.

51. Dischargers located in a watershed area where a Total Maximum Daily Load (TMDL) has been adopted or approved by the Regional Water Board or U.S. EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. Such dischargers may also be required to obtain an individual Regional Water Board permit specific to the area.

H. Effluent Standards

52. The State Water Board convened a blue ribbon panel of storm water experts that submitted a report entitled, "The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities," dated June 19, 2006. The panel concluded that numeric limits or action levels are technically feasible to control construction storm water discharges, provided that certain conditions are considered. The panel also concluded that numeric effluent limitations (NELs) are feasible for discharges from construction sites that utilize an ATS. The State Water Board has incorporated the expert panel's suggestions into this General Permit, which includes numeric action levels (NALs) for pH and turbidity, and special numeric limits for ATS discharges.

Determining Compliance with Numeric Limitations

53. This General Permit sets a pH NAL of 6.5 to 8.5, and a turbidity NAL of 250 NTU. The purpose of the NAL and its associated monitoring requirement is to provide operational information regarding the performance of the measures used at the site to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges. An exceedance of a NAL does not constitute a violation of this General Permit.
54. This General Permit requires dischargers with NAL exceedances to immediately implement additional BMPs and revise their Storm Water Pollution Prevention Plans (SWPPPs) accordingly to either prevent pollutants and authorized non-storm water discharges from contaminating storm water, or to substantially reduce the pollutants to levels consistently below the NALs. NAL exceedances are reported in the State Water Boards SMARTS system, and the discharger is

required to provide an NAL Exceedance Report when requested by a Regional Water Board.

I. Receiving Water Limitations

55. This General Permit requires all enrolled dischargers to determine the receiving waters potentially affected by their discharges and to comply with all applicable water quality standards, including any more stringent standards applicable to a water body.

J. Sampling, Monitoring, Reporting and Record Keeping

56. Visual monitoring of storm water and non-storm water discharges is required for all sites subject to this General Permit.

57. Records of all visual monitoring inspections are required to remain on-site during the construction period and for a minimum of three years.

58. For all Risk Level 3/LUP Type 3 and Risk Level 2/LUP Type 2 sites, this General Permit requires effluent monitoring for pH and turbidity. Sampling, analysis and monitoring requirements for effluent monitoring for pH and turbidity are contained in this General Permit.

59. Risk Level 3 and LUP Type 3 sites with effluent that exceeds the Receiving Water Monitoring Triggers contained in this General Permit and with direct discharges to receiving water are required to conduct receiving water monitoring. An exceedance of a Receiving Water Monitoring Trigger does not constitute a violation of this General Permit.

60. This General Permit establishes a 5 year, 24 hour (expressed in inches of rainfall) as an exemptions to the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 dischargers.

61. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

62. For Risk Level 3 and LUP Type 3 sites larger than 30 acres and with direct discharges to receiving waters, this General Permit requires bioassessment sampling before and after site completion to determine if significant degradation to the receiving water's biota has occurred. Bioassessment sampling guidelines are contained in this General Permit.

63. A summary and evaluation of the sampling and analysis results will be submitted in the Annual Reports.
64. This General Permit contains sampling, analysis and monitoring requirements for non-visible pollutants at all sites subject to this General Permit.
65. Compliance with the General Permit relies upon dischargers to electronically self-report any discharge violations and to comply with any Regional Water Board enforcement actions.
66. This General Permit requires that all dischargers maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed. For LUPs, these documents may be retained in a crew member's vehicle and made available upon request.

K. Active Treatment System (ATS) Requirements

67. Active treatment systems add chemicals to facilitate flocculation, coagulation and filtration of suspended sediment particles. The uncontrolled release of these chemicals to the environment can negatively affect the beneficial uses of receiving waters and/or degrade water quality (e.g., acute and chronic toxicity). Additionally, the batch storage and treatment of storm water through an ATS' can potentially cause physical impacts on receiving waters if storage volume is inadequate or due to sudden releases of the ATS batches and improperly designed outfalls.
68. If designed, operated and maintained properly an ATS can achieve very high removal rates of suspended sediment (measured as turbidity), albeit at sometimes significantly higher costs than traditional erosion/sediment control practices. As a result, this General Permit establishes NELs consistent with the expected level of typical ATS performance.
69. This General Permit requires discharges of storm water associated with construction activity that undergo active treatment to comply with special operational and effluent limitations to ensure that these discharges do not adversely affect the beneficial uses of the receiving waters or cause degradation of their water quality.
70. For ATS discharges, this General Permit establishes technology-based NELs for turbidity.

71. This General Permit establishes a 10 year, 24 hour (expressed in inches of rainfall) Compliance Storm Event exemption from the technology-based numeric effluent limitations for ATS discharges. Exceedances of the ATS turbidity NEL constitutes a violation of this General Permit.

L. Post-Construction Requirements

72. This General Permit includes performance standards for post-construction that are consistent with State Water Board [Resolution No. 2005-0006](#), "Resolution Adopting the Concept of Sustainability as a Core Value for State Water Board Programs and Directing Its Incorporation," and [2008-0030](#), "Requiring Sustainable Water Resources Management." The requirement for all construction sites to match pre-project hydrology will help ensure that the physical and biological integrity of aquatic ecosystems are sustained. This "runoff reduction" approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and waterbodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.
73. LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to pre-construction conditions.

M. Storm Water Pollution Prevention Plan Requirements

74. This General Permit requires the development of a site-specific SWPPP. The SWPPP must include the information needed to demonstrate compliance with all requirements of this General Permit, and must be kept on the construction site and be available for review. The discharger shall ensure that a QSD develops the SWPPP.
75. To ensure proper site oversight, this General Permit requires a Qualified SWPPP Practitioner to oversee implementation of the BMPs required to comply with this General Permit.

N. Regional Water Board Authorities

76. Regional Water Boards are responsible for implementation and enforcement of this General Permit. A general approach to permitting is not always suitable for every construction site and environmental circumstances. Therefore, this General Permit recognizes that Regional Water Boards must have some flexibility and authority to alter, approve, exempt, or rescind permit authority granted under this

General Permit in order to protect the beneficial uses of our receiving waters and prevent degradation of water quality.

IT IS HEREBY ORDERED that all dischargers subject to this General Permit shall comply with the following conditions and requirements (including all conditions and requirements as set forth in Attachments A, B, C, D, E and F)⁶:

II. CONDITIONS FOR PERMIT COVERAGE

A. Linear Underground/Overhead Projects (LUPs)

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g. telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.
2. The Legally Responsible Person is responsible for obtaining coverage under the General Permit where the construction of pipelines, utility lines, fiber-optic cables, or other linear underground/overhead projects will occur across several properties unless the LUP construction activities are covered under another construction storm water permit.
3. Only LUPs shall comply with the conditions and requirements in Attachment A, A.1 & A.2 of this Order. The balance of this Order is not applicable to LUPs except as indicated in Attachment A.

⁶ These attachments are part of the General Permit itself and are not separate documents that are capable of being updated independently by the State Water Board.

B. Obtaining Permit Coverage Traditional Construction Sites

1. The Legally Responsible Person (LRP) (see Special Provisions, Electronic Signature and Certification Requirements, Section IV.I.1) must obtain coverage under this General Permit.
2. To obtain coverage, the LRP must electronically file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.
3. PRDs shall consist of:
 - a. Notice of Intent (NOI)
 - b. Risk Assessment (Section VIII)
 - c. Site Map
 - d. Storm Water Pollution Prevention Plan (Section XIV)
 - e. Annual Fee
 - f. Signed Certification Statement

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

Attachment B contains additional PRD information. Dischargers must electronically file the PRDs, and mail the appropriate annual fee to the State Water Board.

4. This permit is effective on July 1, 2010.
 - a. **Dischargers Obtaining Coverage On or After July 1, 2010:** All dischargers requiring coverage on or after July 1, 2010, shall electronically file their PRDs prior to the commencement of construction activities, and mail the appropriate annual fee no later than seven days prior to the commencement of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the State Water Board, and a WDID number is assigned and sent by SMARTS.
 - b. **Dischargers Covered Under 99-08-DWQ and 2003-0007-DWQ:** Existing dischargers subject to State Water Board Order No. 99-08-DWQ (existing dischargers) will continue coverage under 99-08-DWQ until July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 99-08-DWQ will be terminated.

Existing dischargers shall electronically file their PRDs no later than July 1, 2010. If an existing discharger's site acreage subject to the annual fee has changed, it shall mail a revised annual fee no less than seven days after receiving the revised annual fee notification, **or else lose permit coverage**. All existing dischargers shall be exempt from the risk determination requirements in Section VIII of this General Permit until two years after permit adoption. All existing dischargers are therefore subject to Risk Level 1 requirements regardless of their site's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the Section VIII risk determination requirements.

5. The discharger is only considered covered by this General Permit upon receipt of a Waste Discharger Identification (WDID) number assigned and sent by the State Water Board Storm water Multi-Application and Report Tracking System (SMARTS). In order to demonstrate compliance with this General Permit, the discharger must obtain a WDID number and must present documentation of a valid WDID upon demand.
6. During the period this permit is subject to review by the U.S. EPA, the prior permit (State Water Board Order No. 99-08-DWQ) remains in effect. Existing dischargers under the prior permit will continue to have coverage under State Water Board Order No. 99-08-DWQ until this General Permit takes effect on July 1, 2010. Dischargers who complete their projects and electronically file an NOT prior to July 1, 2010, are not required to obtain coverage under this General Permit.
7. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the

rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

8. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. Revising Permit Coverage for Change of Acreage or New Ownership

1. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage have been met (See Section II.D Conditions for Termination of Coverage); when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site.
2. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRDs that include:
 - a. A revised NOI indicating the new project size;
 - b. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage in Section II.D below.
 - c. SWPPP revisions, as appropriate; and
 - d. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.
 - e. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

3. The discharger shall continue coverage under the General Permit for any parcel that has not achieved “Final Stabilization” as defined in Section II.D.
4. When an LRP with active General Permit coverage transfers its LRP status to another person or entity that qualifies as an LRP, the existing LRP shall inform the new LRP of the General Permit’s requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP’s approved signatory, must submit PRDs in accordance with this General Permit’s requirements.

D. Conditions for Termination of Coverage

1. Within 90 days of when construction is complete or ownership has been transferred, the discharger shall electronically file a Notice of Termination (NOT), a final site map, and photos through the State Water Boards SMARTS system. Filing a NOT certifies that all General Permit requirements have been met. The Regional Water Board will consider a construction site complete only when all portions of the site have been transferred to a new owner, or all of the following conditions have been met:
 - a. For purposes of “final stabilization,” the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;
 - b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;
 - c. Final stabilization has been reached;
 - d. Construction materials and wastes have been disposed of properly;
 - e. Compliance with the Post-Construction Standards in Section XIII of this General Permit has been demonstrated;
 - f. Post-construction storm water management measures have been installed and a long-term maintenance plan⁷ has been established; and
 - g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

⁷ For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.

2. The discharger shall certify that final stabilization conditions are satisfied in their NOT. Failure to certify shall result in continuation of permit coverage and annual billing.
3. The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1.a) is attained by one of the following methods:

- a. "70% final cover method," no computational proof required

OR:

- b. "RUSLE or RUSLE2 method," computational proof required

OR:

- c. "Custom method", the discharger shall demonstrate in some other manner than a or b, above, that the site complies with the "final stabilization" requirement in Section II.D.1.a.

III. DISCHARGE PROHIBITIONS

- A.** Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.
- B.** All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.
- C.** Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. The discharge of non-storm water is authorized under the following conditions:
1. The discharge does not cause or contribute to a violation of any water quality standard;
 2. The discharge does not violate any other provision of this General Permit;
 3. The discharge is not prohibited by the applicable Basin Plan;
 4. The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
 5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
 6. The discharge is monitored and meets the applicable NALs; and
 7. The discharger reports the sampling information in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not already authorized by this General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

- D.** Debris resulting from construction activities are prohibited from being discharged from construction sites.

- E.** When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

IV. SPECIAL PROVISIONS

A. Duty to Comply

1. The discharger shall comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.
2. The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

B. General Permit Actions

1. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.
2. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

D. Duty to Mitigate

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

F. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

G. Duty to Maintain Records and Provide Information

1. The discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be available at the construction site until construction is completed.
2. The discharger shall furnish the Regional Water Board, State Water Board, or U.S. EPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

H. Inspection and Entry

The discharger shall allow the Regional Water Board, State Water Board, U.S. EPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
3. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and
4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

I. Electronic Signature and Certification Requirements

1. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.
2. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.
3. All Annual Reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, U.S. EPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

J. Certification

Any person signing documents under Section IV.I above, shall make the following certification:

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

K. Anticipated Noncompliance

The discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

L. Bypass

Bypass⁸ is prohibited. The Regional Water Board may take enforcement action against the discharger for bypass unless:

1. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;⁹
2. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventative maintenance;
3. The discharger submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or
4. The discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The discharger shall submit notice of an unanticipated bypass as required.

M. Upset

1. A discharger that wishes to establish the affirmative defense of an upset¹⁰ in an action brought for noncompliance shall demonstrate,

⁸ The intentional diversion of waste streams from any portion of a treatment facility

⁹ Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

¹⁰ An exceptional incident in which there is unintentional and temporary noncompliance the technology based numeric effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

through properly signed, contemporaneous operating logs, or other relevant evidence that:

- a. An upset occurred and that the discharger can identify the cause(s) of the upset
 - b. The treatment facility was being properly operated by the time of the upset
 - c. The discharger submitted notice of the upset as required; and
 - d. The discharger complied with any remedial measures required
2. No determination made before an action of noncompliance occurs, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.
 3. In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof

N. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

O. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

P. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

Q. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

R. Penalties for Violations of Permit Conditions

1. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500¹¹ per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.
2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

S. Transfers

This General Permit is not transferable.

T. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

¹¹ May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

V. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

A. Narrative Effluent Limitations

1. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
2. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1- Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		Risk Level 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2	1	NTU	250 NTU
		Risk Level 3			250 NTU

B. Numeric Action Levels (NALs)

1. For Risk Level 2 and 3 dischargers, the lower storm event average NAL for pH is 6.5 pH units and the upper storm event average NAL for

pH is 8.5 pH units. The discharger shall take actions as described below if the discharge is outside of this range of pH values.

2. For Risk Level 2 and 3 dischargers, the NAL storm event daily average for turbidity is 250 NTU. The discharger shall take actions as described below if the discharge is outside of this range of turbidity values.
3. Whenever the results from a storm event daily average indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.
4. The site evaluation shall be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:
 - a. Are related to the construction activities and whether additional BMPs are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

AND/OR:

- b. Are related to the run-on associated with the construction site location and whether additional BMPs measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) what corrective action(s) were taken or will be taken with a description of the schedule for completion.

C. Receiving Water Monitoring Triggers

1. The receiving water monitoring triggers for Risk Level 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge¹² fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

2. Risk Level 3 dischargers with with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this general permit.
3. Risk Level 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

<http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif>
<http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif>

Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

4. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

¹² A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

VI. RECEIVING WATER LIMITATIONS

- A.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.
- B.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.
- C.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).
- D.** Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL has been approved by the U.S. EPA, shall comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of the pollution.

VII. TRAINING QUALIFICATIONS AND CERTIFICATION REQUIREMENTS

A. General

The discharger shall ensure that all persons responsible for implementing requirements of this General Permit shall be appropriately trained in accordance with this Section. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Those responsible for preparing and amending SWPPPs shall comply with the requirements in this Section VII.

The discharger shall provide documentation of all training for persons responsible for implementing the requirements of this General Permit in the Annual Reports.

B. SWPPP Certification Requirements

1. **Qualified SWPPP Developer:** The discharger shall ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:
 - a. A California registered professional civil engineer;
 - b. A California registered professional geologist or engineering geologist;
 - c. A California registered landscape architect;
 - d. A professional hydrologist registered through the American Institute of Hydrology;
 - e. A Certified Professional in Erosion and Sediment Control (CPESC)TM registered through Enviro Cert International, Inc.;
 - f. A Certified Professional in Storm Water Quality (CPSWQ)TM registered through Enviro Cert International, Inc.; or
 - g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

2. The discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.
3. **Qualified SWPPP Practitioner:** The discharger shall ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:
 - a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or
 - b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

4. The LRP shall list in the SWPPP, the name of any Approved Signatory, and provide a copy of the written agreement or other mechanism that provides this authority from the LRP in the SWPPP.
5. The discharger shall include, in the SWPPP, a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.
6. The discharger shall ensure that the SWPPP and each amendment will be signed by the Qualified SWPPP Developer. The discharger shall include a listing of the date of initial preparation and the date of each amendment in the SWPPP.

VIII. RISK DETERMINATION

The discharger shall calculate the site's sediment risk and receiving water risk during periods of soil exposure (i.e. grading and site stabilization) and use the calculated risks to determine a Risk Level(s) using the methodology in

Appendix 1. For any site that spans two or more planning watersheds,¹³ the discharger shall calculate a separate Risk Level for each planning watershed. The discharger shall notify the State Water Board of the site's Risk Level determination(s) and shall include this determination as a part of submitting the PRDs. If a discharger ends up with more than one Risk Level determination, the Regional Water Board may choose to break the project into separate levels of implementation.

IX. RISK LEVEL 1 REQUIREMENTS

Risk Level 1 Dischargers shall comply with the requirements included in Attachment C of this General Permit.

X. RISK LEVEL 2 REQUIREMENTS

Risk Level 2 Dischargers shall comply with the requirements included in Attachment D of this General Permit.

XI. RISK LEVEL 3 REQUIREMENTS

Risk Level 3 Dischargers shall comply with the requirements included in Attachment E of this General Permit.

XII. ACTIVE TREATMENT SYSTEMS (ATS)

Dischargers choosing to implement an ATS on their site shall comply with all of the requirements in Attachment F of this General Permit.

¹³ Planning watershed: defined by the Calwater Watershed documents as a watershed that ranges in size from approximately 3,000 to 10,000 acres <http://cain.ice.ucdavis.edu/calwater/calwfaq.html>, <http://gis.ca.gov/catalog/BrowseRecord.epl?id=22175> .

XIII. POST-CONSTRUCTION STANDARDS

- A.** All dischargers shall comply with the following runoff reduction requirements unless they are located within an area subject to post-construction standards of an active Phase I or II municipal separate storm sewer system (MS4) permit that has an approved Storm Water Management Plan.
1. This provision shall take effect three years from the adoption date of this permit, or later at the discretion of the Executive Officer of the Regional Board.
 2. The discharger shall demonstrate compliance with the requirements of this section by submitting with their NOI a map and worksheets in accordance with the instructions in Appendix 2. The discharger shall use non-structural controls unless the discharger demonstrates that non-structural controls are infeasible or that structural controls will produce greater reduction in water quality impacts.
 3. The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using non-structural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.
 4. For sites whose disturbed area exceeds two acres, the discharger shall preserve the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream¹⁴ or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration.

¹⁴ A first order stream is defined as a stream with no tributaries.

- B.** All dischargers shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

XIV. SWPPP REQUIREMENTS

- A.** The discharger shall ensure that the Storm Water Pollution Prevention Plans (SWPPPs) for all traditional project sites are developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:
1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
 2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
 3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;
 4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and
 5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.
- B.** To demonstrate compliance with requirements of this General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.
- C.** The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

XV. REGIONAL WATER BOARD AUTHORITIES

- A.** In the case where the Regional Water Board does not agree with the discharger's self-reported risk level (e.g., they determine themselves to be a Level 1 Risk when they are actually a Level 2 Risk site), Regional Water Boards may either direct the discharger to reevaluate the Risk Level(s) for their site or terminate coverage under this General Permit.
- B.** Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.
- C.** Regional Water Boards may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.
- D.** Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.
- E.** Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

XVI. ANNUAL REPORTING REQUIREMENTS

- A.** All dischargers shall prepare and electronically submit an Annual Report no later than September 1 of each year.
- B.** The discharger shall certify each Annual Report in accordance with the Special Provisions.
- C.** The discharger shall retain an electronic or paper copy of each Annual Report for a minimum of three years after the date the annual report is filed.
- D.** The discharger shall include storm water monitoring information in the Annual Report consisting of:
 - 1. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;
 - 2. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");
 - 3. a summary of all corrective actions taken during the compliance year;
 - 4. identification of any compliance activities or corrective actions that were not implemented;
 - 5. a summary of all violations of the General Permit;
 - 6. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;
 - 7. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and
 - 8. the visual observation and sample collection exception records and reports specified in Attachments C, D, and E.
- E.** The discharger shall provide training information in the Annual Report consisting of:
 - 1. documentation of all training for individuals responsible for all activities associated with compliance with this General Permit;

2. documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
3. documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

**ATTACHMENT A
Linear Underground/ Overhead Requirements**

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All Linear Underground/Overhead project dischargers who submit permit registration documents (PRDs) indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

A. DEFINITION OF LINEAR UNDERGROUND/OVERHEAD PROJECTS

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

2. LUP evaluation shall consist of two tasks:

- a. Confirm that the project or project section(s) qualifies as an LUP. The State Water Board website contains a project determination guidance flowchart.
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constructionpermits.shtml
 - b. Identify which Type(s) (1, 2 or 3 described in Section I below) are applicable to the project or project sections based on project sediment and receiving water risk. (See Attachment A.1)
3. A Legally Responsible Person (LRP) for a Linear Underground/Overhead project is required to obtain CGP coverage under one or more permit registration document (PRD) electronic submittals to the State Water Board's Storm Water Multi-Application and Report Tracking (SMARTs) system. Attachment A.1 contains a flow chart to be used when determining if a linear project qualifies for coverage and to determine LUP Types. Since a LUP may be constructed within both developed and undeveloped locations and portions of LUPs may be constructed by different contractors, LUPs may be broken into logical permit sections. Sections may be determined based on portions of a project conducted by one contractor. Other situations may also occur, such as the time period in which the sections of a project will be constructed (e.g. project phases), for which separate permit coverage is possible. For projects that are broken into separate sections, a description of how each section relates to the overall project and the definition of the boundaries between sections shall be clearly stated.
 4. Where construction activities transverse or enter into different Regional Water Board jurisdictions, LRPs shall obtain permit coverage for each Regional Water Board area involved prior to the commencement of construction activities.
 5. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small linear construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

B. LINEAR PROJECT PERMIT REGISTRATION DOCUMENTS (PRDs)

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted. PRDs shall consist of the following:

1. Notice of Intent (NOI)

Prior to construction activities, the LRP of a proposed linear underground/overhead project shall utilize the processes and methods provided in Attachment A.2, Permit Registration Documents (PRDs) – General Instructions for Linear Underground/Overhead Projects to comply with the Construction General Permit.

2. Site Maps

LRPs submitting PRDs shall include at least 3 maps. The first map will be a zoomed¹ 1000-1500 ft vicinity map that shows the starting point of the project. The second will be a zoomed map of 1000-1500 ft showing the ending location of the project. The third will be a larger view vicinity map, 1000 ft to 2000 ft, displaying the entire project location depending on the project size, and indicating the LUP type (1, 2 or 3) areas within the total project footprint.

3. Drawings

LRPs submitting PRDs shall include a construction drawing(s) or other appropriate drawing(s) or map(s) that shows the locations of storm drain

¹ An image with a close-up/enhanced detailed view of site features that show minute details such as streets and neighboring structures.

Or: An image with a close-up/enhanced detailed view of the site's surrounding infrastructure.

Or: An image with a close up detailed view of the project and its surroundings.

inlets and waterbodies² that may receive discharges from the construction activities and that shows the locations of BMPs to be installed for all those BMPs that can be illustrated on the revisable drawing(s) or map(s). If storm drain inlets, waterbodies, and/or BMPs cannot be adequately shown on the drawing(s) or map(s) they should be described in detail within the SWPPP.

4. Storm Water Pollution Prevention Plan (SWPPP)

LUP dischargers shall comply with the SWPPP Preparation, Implementation, and Oversight requirements in Section K of this Attachment.

5. Contact information

LUP dischargers shall include contact information for all contractors (or subcontractors) responsible for each area of an LUP project. This should include the names, telephone numbers, and addresses of contact personnel. Specific areas of responsibility of each contact, and emergency contact numbers should also be included.

- 6.** In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. LINEAR PROJECT TERMINATION OF COVERAGE REQUIREMENTS

The LRP may terminate coverage of an LUP when construction activities are completed by submitting an electronic notice of termination (NOT) through the State Water Board's SMARTS system. Termination requirements are different depending on the complexity of the LUP. An LUP is considered complete when: (a) there is no potential for construction-related storm water pollution; (b) all elements of the SWPPP have been completed; (c) construction materials and waste have been disposed of properly; (d) the site is in compliance with all local storm water management requirements; and (e) the LRP submits a notice of termination (NOT) and has received approval for termination from the appropriate Regional Water Board office.

1. LUP Stabilization Requirements

The LUP discharger shall ensure that all disturbed areas of the construction site are stabilized prior to termination of coverage under this General Permit. Final stabilization for the purposes of submitting an NOT

² Includes basin(s) that the MS4 storm sewer systems may drain to for Hydromodification or Hydrological Conditional of Concerns under the MS4 permits.

is satisfied when all soil disturbing activities are completed and one of the following criteria is met:

- a. In disturbed areas that were vegetated prior to construction activities of the LUP, the area disturbed must be re-established to a uniform vegetative cover equivalent to 70 percent coverage of the preconstruction vegetative conditions. Where preconstruction vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: if the preconstruction vegetation covers 50 percent of the ground surface, 70 percent of 50 percent ($.70 \times .50 = .35$) would require 35 percent total uniform surface coverage; or
- b. Where no vegetation is present prior to construction, the site is returned to its original line and grade and/or compacted to achieve stabilization; or
- c. Equivalent stabilization measures have been employed. These measures include, but are not limited to, the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

2. LUP Termination of Coverage Requirements

The LRP shall file an NOT through the State Water Board's SMARTS system. By submitting an NOT, the LRP is certifying that construction activities for an LUP are complete and that the project is in full compliance with requirements of this General Permit and that it is now compliant with soil stabilization requirements where appropriate. Upon approval by the appropriate Regional Water Board office, permit coverage will be terminated.

3. Revising Coverage for Change of Acreage

When the LRP of a portion of an LUP construction project changes, or when a phase within a multi-phase project is completed, the LRP may reduce the total acreage covered by this General Permit. In reducing the acreage covered by this General Permit, the LRP shall electronically file revisions to the PRDs that include:

- a. a revised NOI indicating the new project size;
- b. a revised site map showing the acreage of the project completed, acreage currently under construction, acreage sold, transferred or added, and acreage currently stabilized.
- c. SWPPP revisions, as appropriate; and
- d. certification that any new LRPs have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address (if known) of the new LRP.

If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

D. DISCHARGE PROHIBITIONS

1. LUP dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.
2. LUP dischargers are prohibited from discharging non-storm water that is not otherwise authorized by this General Permit. Non-storm water discharges authorized by this General Permit³ may include, fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, street cleaning, dewatering,⁴ uncontaminated groundwater from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post-construction BMPs designed to keep materials on site. These authorized non-storm water discharges:

³ Dischargers must identify all authorized non-storm water discharges in the LUP's SWPPP and identify BMPs that will be implemented to either eliminate or reduce pollutants in non-storm water discharges. Regional Water Boards may direct the discharger to discontinue discharging such non-storm water discharges if determined that such discharges discharge significant pollutants or threaten water quality.

⁴Dewatering activities may be prohibited or need coverage under a separate permit issued by the Regional Water Boards. Dischargers shall check with the appropriate Regional Water Boards for any required permit or basin plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies.

- a. Shall not cause or contribute to a violation of any water quality standard;
- b. Shall not violate any other provision of this General Permit;
- c. Shall not violate any applicable Basin Plan;
- d. Shall comply with BMPs as described in the SWPPP;
- e. Shall not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
- f. Shall be monitored and meets the applicable NALs; and
- g. Shall be reported by the discharger in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not authorized by this General Permit to determine the need for a separate NPDES permit.

Additionally, some LUP dischargers may be required to obtain a separate permit if the applicable Regional Water Board has adopted a General Permit for dewatering discharges. Wherever feasible, alternatives, that do not result in the discharge of non-storm water, shall be implemented in accordance with this Attachment's Section K.2 - SWPPP Implementation Schedule.

3. LUP dischargers shall ensure that trench spoils or any other soils disturbed during construction activities that are contaminated⁵ are not discharged with storm water or non-storm water discharges into any storm drain or water body except pursuant to an NPDES permit.

When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the LUP discharger shall have those soils sampled and tested to ensure that proper handling and public safety measures are

⁵ Contaminated soil contains pollutants in concentrations that exceed the appropriate thresholds that various regulatory agencies set for those substances. Preliminary testing of potentially contaminated soils will be based on odor, soil discoloration, or prior history of the site's chemical use and storage and other similar factors. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The legally responsible person will notify the appropriate local, State, or federal agency(ies) when contaminated soil is found at a construction site, and will notify the Regional Water Board by submitting an NOT at the completion of the project.

- implemented. The LUP discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.
4. Discharging any pollutant-laden water that will cause or contribute to an exceedance of the applicable Regional Water Board's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain is prohibited.
 5. Debris⁶ resulting from construction activities are prohibited from being discharged from construction project sites.

E. SPECIAL PROVISIONS

1. Duty to Comply

- a. The LUP discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.
- b. The LUP discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

2. General Permit Actions

- a. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

⁶ Litter, rubble, discarded refuse, and remains of something destroyed.

- b. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an LUP discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

4. Duty to Mitigate

The LUP discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The LUP discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of the Storm Water Pollution Prevention Plan (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

6. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

7. Duty to Maintain Records and Provide Information

- a. The LUP discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be kept at the construction site or in a crew

member's vehicle until construction is completed, and shall be made available upon request.

- b. The LUP discharger shall furnish the Regional Water Board, State Water Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The LUP discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

8. Inspection and Entry

The LUP discharger shall allow the Regional Water Board, State Water Board, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;
- b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
- c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and
- d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

9. Electronic Signature and Certification Requirements

- a. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.
- b. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or

together with any reports, information or applications to be signed by an Approved Signatory.

- c. All SWPPP revisions, annual reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, USEPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

10. Certification

Any person signing documents under Section E.9 above, shall make the following certification:

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

11. Anticipated Noncompliance

The LUP discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

13. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the LUP discharger is or may be subject to under Section 311 of the CWA.

14. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

15. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

16. Penalties for Violations of Permit Conditions

- a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500⁷ per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.
- b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

17. Transfers

This General Permit is not transferable. A new LRP of an ongoing construction activity must submit PRDs in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An LRP who is a property owner with active General Permit coverage who sells a fraction or all the land shall inform the new property owner(s) of the requirements of this General Permit.

18. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those

⁷ May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act

dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

F. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

1. Narrative Effluent Limitations

- a. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges regulated by this General Permit do not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
- b. LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of structural or non-structural controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1. Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	LUP Type 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		LUP Type 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	LUP Type 2	1	NTU	250 NTU
		LUP Type 3			250 NTU

2. Numeric Action Levels (NALs)

- a. For LUP Type 2 and 3 dischargers, the lower storm event daily average NAL for pH is 6.5 pH units and the upper storm event daily average NAL for pH is 8.5 pH units. The LUP discharger shall take actions as described below if the storm event daily average discharge is outside of this range of pH values.
- b. For LUP Type 2 and 3 dischargers, the storm event daily average NAL for turbidity is 250 NTU. The discharger shall take actions as described below if the storm event daily average discharge is outside of this range of turbidity values.
- c. Whenever daily average analytical effluent monitoring results indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the LUP discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.
- d. The site evaluation will be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:
 - i. Are related to the construction activities and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

AND/OR:

- ii. Are related to the run-on associated with the construction site location and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) decide what corrective action(s) were taken or will be taken, including a description of the schedule for completion.

3. Receiving Water Monitoring Triggers

- a. The receiving water monitoring triggers for LUP Type 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge⁸ fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.
- b. LUP Type 3 dischargers with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this General Permit.
- c. LUP Type 3 dischargers with direct discharges to surface waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

<http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif>
<http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif>

Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

- d. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

G. RECEIVING WATER LIMITATIONS

1. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.
2. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.
3. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or

⁸ A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

H. TRAINING QUALIFICATIONS

1. General

All persons responsible for implementing requirements of this General Permit shall be appropriately trained. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Persons responsible for preparing, amending and certifying SWPPPs shall comply with the requirements in this Section H.

2. SWPPP Certification Requirements

- a. **Qualified SWPPP Developer:** The LUP discharger shall ensure that all SWPPPs be written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:
 - i A California registered professional civil engineer;
 - ii A California registered professional geologist or engineering geologist;
 - iii A California registered landscape architect;
 - iv A professional hydrologist registered through the American Institute of Hydrology;
 - v A certified professional in erosion and sediment control (CPESC)TM registered through Enviro Cert International, Inc;
 - vi A certified professional in storm water quality (CPSWQ)TM registered through Enviro Cert International, Inc.; or
 - vii A certified professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

- b. The LUP discharger shall ensure that the SWPPP is written and amended, as needed, to address the specific circumstances for each construction site covered by this General Permit prior to commencement of construction activity for any stage.
- c. The LUP discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.
- d. **Qualified SWPPP Practitioner:** The LUP discharger shall ensure that all elements of any SWPPP for each project will be implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis, and for ensuring full compliance with the permit and implementation of all elements of the SWPPP. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:
 - i. A certified erosion, sediment and storm water inspector registered through Certified Professional in Erosion and Sediment Control, Inc.; or
 - ii. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

- e. The LUP discharger shall ensure that the SWPPP include a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner, and who is ultimately responsible for implementation of the SWPPP. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.
- f. The LUP discharger shall ensure that the SWPPP and each amendment be signed by the Qualified SWPPP Developer. The LUP discharger shall include a listing of the date of initial preparation and the dates of each amendment in the SWPPP.

I. TYPES OF LINEAR PROJECTS

This attachment establishes three types (Type 1, 2 & 3) of complexity for areas within an LUP or project section based on threat to water quality. Project area Types are determined through Attachment A.1.

The Type 1 requirements below establish the baseline requirements for all LUPs subject to this General Permit. Additional requirements for Type 2 and Type 3 LUPs are labeled.

1. Type 1 LUPs:

LUP dischargers with areas of a LUP designated as Type 1 shall comply with the requirements in this Attachment. Type 1 LUPs are:

- a. Those construction areas where 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day; or
- b. Where greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:
 - i. Areas disturbed during construction will be returned to preconstruction conditions or equivalent protection is established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and
 - ii. Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization BMPs will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.
- c. Where the risk determination is as follows:
 - i. Low sediment risk, low receiving water risk, or
 - ii. Low sediment risk, medium receiving water risk, or
 - iii. Medium sediment risk, low receiving water risk

2. Type 2 LUPs:

Type 2 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 2 LUPs have the specified combination of risk:

- d. High sediment risk, low receiving water risk, or
- e. Medium sediment risk, medium receiving water risk, or
- f. Low sediment risk, high receiving water risk

Receiving water risk is either considered “Low” for those areas of the project that are not in close proximity to a sensitive receiving watershed, “Medium” for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, and “High” where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C of this General Permit.

3. Type 3 LUPs:

Type 3 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 3 LUPs have the specified combination of risk:

- a. High sediment risk, high receiving water risk, or
- b. High sediment risk, medium receiving water risk, or
- c. Medium sediment risk, high receiving water risk

Receiving water risk is either considered “Medium” for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, or “High” where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C.

J. LUP TYPE-SPECIFIC REQUIREMENTS**1. Effluent Standards**

- a. Narrative – LUP dischargers shall comply with the narrative effluent standards below.

- i Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
 - ii LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
- b. Numeric – LUP Type 1 dischargers are not subject to a numeric effluent standard
 - c. Numeric –LUP Type 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.
 - d. Numeric – LUP Type 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

2. Good Site Management "Housekeeping"

- a. LUP dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, the good housekeeping measures shall consist of the following:
 - i Identify the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - ii Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).
 - iii Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
 - iv Minimize exposure of construction materials to precipitation (not applicable to materials designed to be outdoors and exposed to the environment).

- v Implement BMPs to control the off-site tracking of loose construction and landscape materials.
- b. LUP dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
 - i Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
 - ii Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
 - iii Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
 - iv Cover waste disposal containers at the end of every business day and during a rain event.
 - v Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
 - vi Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
 - vii Implement procedures that effectively address hazardous and non-hazardous spills.
 - viii Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
 - (1) Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and
 - (2) Appropriate spill response personnel are assigned and trained.
 - ix Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

- c. LUP dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
- i Prevent oil, grease, or fuel from leaking into the ground, storm drains or surface waters.
 - ii Implement appropriate BMPs whenever equipment or vehicles are fueled, maintained or stored.
 - iii Clean leaks immediately and disposing of leaked materials properly.
- d. LUP dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
- i Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
 - ii Contain fertilizers and other landscape materials when they are not actively being used.
 - iii Discontinue the application of any erodible landscape material at least 2 days before a forecasted rain event⁹ or during periods of precipitation.
 - iv Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
 - v Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.
- e. LUP dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, LUP dischargers shall do the following:

⁹ 50% or greater chance of producing precipitation.

- i Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
 - ii Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
 - iii Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
 - iv Ensure retention of sampling, visual observation, and inspection records.
 - v Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
- f. LUP dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations.

3. Non-Storm Water Management

- a. LUP dischargers shall implement measures to control all non-storm water discharges during construction.
- b. LUP dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.
- c. LUP dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

4. Erosion Control

- a. LUP dischargers shall implement effective wind erosion control.
- b. LUP dischargers shall provide effective soil cover for inactive¹⁰ areas and all finished slopes, and utility backfill.

¹⁰ Areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days

- c. LUP dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

5. Sediment Controls

- a. LUP dischargers shall establish and maintain effective perimeter controls as needed, and implement effective BMPs for all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
- b. On sites where sediment basins are to be used, LUP dischargers shall, at minimum, design sediment basins according to the guidance provided in CASQA’s Construction BMP Handbook.
- c. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths¹¹ in accordance with Table 2 below.

Table 2 – Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

- d. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent off-site tracking of sediment.
- e. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
- f. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall inspect all immediate access roads. At a minimum daily and prior to any rain event, the discharger shall remove any

¹¹ Sheet flow length is the length that shallow, low velocity flow travels across a site.

sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

- g. **Additional LUP Type 3 Requirement:** The Regional Water Board may require LUP Type 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

6. Run-on and Run-off Controls

- a. LUP dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this Attachment.
- b. Run-on and runoff controls are not required for Type 1 LUPs unless the evaluation of quantity and quality of run-on and runoff deems them necessary or visual inspections show that the site requires such controls.

7. Inspection, Maintenance and Repair

- a. All inspection, maintenance repair and sampling activities at the discharger's LUP location shall be performed or supervised by a QSP representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
- b. LUP dischargers shall conduct visual inspections and observations daily during working hours (not recorded). At least once each 24-hour period during extended storm events, **LUP Type 2 & 3 dischargers** shall conduct visual inspections to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.
- c. Upon identifying failures or other shortcomings, as directed by the QSP, LUP dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
- d. For each pre- and post-rain event inspection required, LUP dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format that includes the information described below.

- e. The LUP discharger shall ensure that the checklist remains on-site or with the SWPPP. At a minimum, an inspection checklist should include:
 - i Inspection date and date the inspection report was written.
 - ii Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
 - iii Site information, including stage of construction, activities completed, and approximate area of the site exposed.
 - iv A description of any BMPs evaluated and any deficiencies noted.
 - v If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
 - vi Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
 - vii Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
 - viii Photographs taken during the inspection, if any.
 - ix Inspector's name, title, and signature.

K. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS

1. Objectives

SWPPPs for all LUPs shall be developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

- a. All pollutants and their sources, including sources of sediment, associated with construction activities associated with LUP activity are controlled;
- b. All non-storm water discharges are identified and either eliminated, controlled, or treated;
- c. BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from LUPs during construction; and
- d. Stabilization BMPs installed to reduce or eliminate pollutants after construction is completed are effective and maintained.

2. SWPPP Implementation Schedule

- a. LUPs for which PRDs have been submitted to the State Water Board shall develop a site/project location SWPPP prior to the start of land-disturbing activity in accordance with this Section and shall implement the SWPPP concurrently with commencement of soil-disturbing activities.
- b. For an ongoing LUP involving a change in the LRP, the new LRP shall review the existing SWPPP and amend it, if necessary, or develop a new SWPPP within 15 calendar days to conform to the requirements set forth in this General Permit.

3. Availability

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

L. REGIONAL WATER BOARD AUTHORITIES

1. Regional Water Boards shall administer the provisions of this General Permit. Administration of this General Permit may include, but is not limited to, requesting the submittal of SWPPPs, reviewing SWPPPs, reviewing monitoring and sampling and analysis reports, conducting compliance inspections, gathering site information by any medium including sampling, photo and video documentation, and taking enforcement actions.
2. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.
3. Regional Water Boards may issue separate permits for discharges of storm water associated with construction activity to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a Regional Water Board, dischargers subject to those permits shall no longer be regulated by this General Permit.
4. Regional Water Boards may direct the discharger to reevaluate the LUP Type(s) for the project (or elements/areas of the project) and impose the appropriate level of requirements.
5. Regional Water Boards may terminate coverage under this General Permit for dischargers who negligently or with willful intent incorrectly determine or report their LUP Type (e.g., they determine themselves to be a LUP Type 1 when they are actually a Type 2).
6. Regional Water Boards may review PRDs and reject or accept applications for permit coverage or may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.
7. Regional Water Boards may impose additional requirements on dischargers to satisfy TMDL implementation requirements or to satisfy provisions in their Basin Plans.
8. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.
9. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

- 10.** Based on an LUP's threat to water quality and complexity, the Regional Water Board may determine on a case-by-case basis that an LUP, or a portion of an LUP, is not eligible for the linear project requirements contained in this Attachment, and require that the discharger comply with all standard requirements in this General Permit.

- 11.** The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

M. MONITORING AND REPORTING REQUIREMENTS

Table 3. LUP Summary of Monitoring Requirements

LUP Type	Visual Inspections				Sample Collection		
	Daily Site BMP	Pre-storm Event	Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water	Non-Visible (when applicable)
		Baseline					
1	X						X
2	X	X	X	X	X		X
3	X	X	X	X	X	X	X

1. Objectives

LUP dischargers shall prepare a monitoring and reporting program (M&RP) prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The M&RP must be a part of the SWPPP, included as an appendix or separate SWPPP chapter.

2. M&RP Implementation Schedule

- a. LUP dischargers shall implement the requirements of this Section at the time of commencement of construction activity. LUP dischargers are responsible for implementing these requirements until construction activity is complete and the site is stabilized.
- b. LUP dischargers shall revise the M&RP when:
 - i. Site conditions or construction activities change such that a change in monitoring is required to comply with the requirements and intent of this General Permit.
 - ii. The Regional Water Board requires the discharger to revise its M&RP based on its review of the document. Revisions may include, but not be limited to, conducting additional site inspections, submitting reports, and certifications. Revisions shall be submitted via postal mail or electronic e-mail.

- iii The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

3. LUP Type 1 Monitoring and Reporting Requirements

a. LUP Type 1 Inspection Requirements

- i LUP Type 1 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.
- ii LUP Type 1 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.
- iii LUP Type 1 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.
- iv LUP Type 1 dischargers shall conduct daily visual inspections to verify that:
 - (1) Appropriate BMPs for storm water and non-storm water are being implemented in areas where active construction is occurring (including staging areas);
 - (2) Project excavations are closed, with properly protected spoils, and that road surfaces are cleaned of excavated material and construction materials such as chemicals by either removing or storing the material in protective storage containers at the end of every construction day;
 - (3) Land areas disturbed during construction are returned to pre-construction conditions or an equivalent protection is used at the end of each workday to eliminate or minimize erosion and the possible discharge of sediment or other pollutants during a rain event.
- v Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures

are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

- vi Inspection programs are required for LUP Type 1 projects where temporary and permanent stabilization BMPs are installed and are to be monitored after active construction is completed. Inspection activities shall continue until adequate permanent stabilization is established and, in areas where re-vegetation is chosen, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

b. LUP Type 1 Monitoring Requirements for Non-Visible Pollutants

LUP Type 1 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

- i Sampling and analysis for non-visible pollutants is only required where the LUP Type 1 discharger believes pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.
 - (1) Visual observations made during the monitoring program described above will help the LUP Type 1 discharger determine when to collect samples.
 - (2) The LUP Type 1 discharger is not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.
- ii LUP Type 1 dischargers shall collect samples down-gradient from all discharge locations where the visual observations were made triggering the monitoring, and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.
- iii If sampling for non-visible pollutant parameters is required, LUP Type 1 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

- iv LUP Type 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
 - v LUP Type 1 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample¹²) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.
 - vi LUP Type 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).
 - vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 1 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification.
 - viii LUP Type 1 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.
- c. LUP Type 1 Visual Observation Exceptions
- i LUP Type 1 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. The Type 1 LUP discharger is not required to physically collect samples or conduct visual observation (inspections) under the following conditions:
 - (1) During dangerous weather conditions such as flooding and electrical storms;
 - (2) Outside of scheduled site business hours.
 - (3) When access to the site is unsafe due to storm events.

¹² Sample collected at a location unaffected by construction activities.

- ii If the LUP Type 1 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.
- d. Particle Size Analysis for Risk Justification

LUP Type 1 dischargers utilizing justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

4. LUP Type 2 & 3 Monitoring and Reporting Requirements

- a. LUP Type 2 & 3 Inspection Requirements
- i LUP Type 2 & 3 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.
 - ii LUP Type 2 & 3 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.
 - iii LUP Type 2 & 3 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.
 - iv LUP Type 2 & 3 dischargers shall conduct daily visual inspections to verify that appropriate BMPs for storm water and non-storm water are being implemented and in place in areas where active construction is occurring (including staging areas).
 - v LUP Type 2 & 3 dischargers shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that BMPs have functioned adequately. During

extended storm events, inspections shall be required during normal working hours for each 24-hour period.

- vi Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).
- vii LUP Type 2 & 3 dischargers shall implement a monitoring program for inspecting projects that require temporary and permanent stabilization BMPs after active construction is complete. Inspections shall ensure that the BMPs are adequate and maintained. Inspection activities shall continue until adequate permanent stabilization is established and, in vegetated areas, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.
- viii If possible, LUP Type 2 & 3 dischargers shall install a rain gauge on-site at an accessible and secure location with readings made during all storm event inspections. When readings are unavailable, data from the closest rain gauge with publically available data may be used.
- ix LUP Type 2 & 3 dischargers shall include and maintain a log of the inspections conducted in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection.

b. LUP Type 2 & 3 Storm Water Effluent Monitoring Requirements

Table 4. LUP Type 2 & 3 Effluent Monitoring Requirements

LUP Type	Frequency	Effluent Monitoring
2	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	Turbidity, pH, and non-visible pollutant parameters (if applicable)
3	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	turbidity, pH, and non-visible pollutant parameters (if applicable)

- i LUP Type 2 & 3 dischargers shall collect storm water grab samples from sampling locations characterizing discharges associated with activity from the LUP active areas of construction. At a minimum, 3 samples shall be collected per day of discharge.

- ii LUP Type 2 & 3 dischargers shall collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.
- iii LUP Type 2 & 3 dischargers shall ensure that storm water grab sample(s) obtained be representative of the flow and characteristics of the discharge.
- iv LUP Type 2 & 3 dischargers shall analyze their effluent samples for:
 - (1) pH and turbidity
 - (2) Any additional parameter for which monitoring is required by the Regional Water Board.

c. LUP Type 2 & 3 Storm Water Effluent Sampling Locations

- i LUP Type 2 & 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire disturbed project or area.
- ii LUP Type 2 & 3 dischargers may monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to exceedance of NALs.
- iii LUP Type 2 & 3 dischargers shall select analytical test methods from the list provided in Table 5 below.
- iv LUP Type 2 & 3 dischargers shall ensure that all storm water sample collection preservation and handling shall be conducted in accordance with the “Storm Water Sample Collection and Handling Instructions” below.

d. LUP Type 3 Receiving Water Monitoring Requirements

- i In the event that an LUP Type 3 discharger’s effluent exceeds the receiving water monitoring triggers of 500 NTU turbidity or pH range of 6.0-9.0, contained in this General Permit and has a direct discharge to receiving waters, the LUP discharger shall subsequently sample Receiving Waters (RWs) for turbidity, pH (if applicable) and SSC for the duration of coverage under this General Permit. In the event that an LUP Tupe 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall

subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

- ii LUP Type 3 dischargers that meet the project criteria in Appendix 3 of this General Permit and have more than 30 acres of soil disturbance in the project area or project section area designated as Type 3, shall comply with the Bioassessment requirements prior to commencement of construction activity.
 - iii LUP Type 3 dischargers shall obtain RW samples in accordance with the requirements of the Receiving Water Sampling Locations section (Section M.4.c. of this Attachment).
- e. LUP Type 3 Receiving Water Sampling Locations
- i **Upstream/up-gradient RW samples:** LUP Type 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible to and upstream from the effluent discharge point.
 - ii **Downstream/down-gradient RW samples:** LUP Type 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible to and downstream from the effluent discharge point.
 - iii If two or more discharge locations discharge to the same receiving water, LUP Type 3 dischargers may sample the receiving water at a single upstream and downstream location.

f. LUP Type 2 & 3 Monitoring Requirements for Non-Visible Pollutants

LUP Type 2 & 3 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

- i Sampling and analysis for non-visible pollutants is only required where LUP Type 2 & 3 dischargers believe pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

- (1) Visual observations made during the monitoring program described above will help LUP Type 2 & 3 dischargers determine when to collect samples.
 - (2) LUP Type 2 & 3 dischargers are not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.
- ii LUP Type 2 & 3 dischargers shall collect samples down-gradient from the discharge locations where the visual observations were made triggering the monitoring and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.
 - iii If sampling for non-visible pollutant parameters is required, LUP Type 2 & 3 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.
 - iv LUP Type 2 & 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
 - v LUP Type 2 & 3 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample¹³) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.
 - vi LUP Type 2 & 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).
 - vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 2 & 3 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed.

¹³ Sample collected at a location unaffected by construction activities

Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 2 & 3 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

g. LUP Type 2 & 3 Visual Observation and Sample Collection Exceptions

i LUP Type 2 & 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. Type 2 & 3 LUP dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

ii If the LUP Type 2 or 3 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

h. LUP Type 2 & 3 Storm Water Sample Collection and Handling Instructions

LUP Type 2 & 3 dischargers shall refer to Table 5 below for test Methods, detection Limits, and reporting Units. During storm water sample collection and handling, the LUP Type 2 & 3 discharger shall:

i Identify the parameters required for testing and the number of storm water discharge points that will be sampled. Request the laboratory to provide the appropriate number of sample containers, types of containers, sample container labels, blank chain of custody forms, and sample preservation instructions.

ii Determine how to ship the samples to the laboratory. The testing laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory). The options are to either deliver the samples to the laboratory, arrange to have the laboratory pick them up, or ship them overnight to the laboratory.

- iii Use only the sample containers provided by the laboratory to collect and store samples. Use of any other type of containers could contaminate your samples.
- iv Prevent sample contamination, by not touching, or putting anything into the sample containers before collecting storm water samples.
- v Not overfilling sample containers. Overfilling can change the analytical results.
- vi Tightly screw the cap of each sample container without stripping the threads of the cap.
- vii Complete and attach a label to each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.
- viii Carefully pack sample containers into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment. Remember to place frozen ice packs into the shipping container. Samples should be kept as close to 4° C (39° F) as possible until arriving at the laboratory. Do not freeze samples.
- ix Complete a Chain of Custody form for each set of samples. The Chain of Custody form shall include the discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container.
- x Upon shipping/delivering the sample containers, obtain both the signatures of the persons relinquishing and receiving the sample containers.
- xi Designate and train personnel to collect, maintain, and ship samples in accordance with the above sample protocols and good laboratory practices.
- xii Refer to the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP) for more

information on sampling collection and analysis. See http://www.waterboards.ca.gov/water_issues/programs/swamp/¹⁴

Table 5. Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Levels	(LUP Type 3) Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Type 2 & 3	0.2	pH units	Lower = 6.5 upper = 8.5	Lower = 6.0 upper = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Type 2 & 3	1	NTU	250 NTU	500 NTU
SSC	ASTM Method D 3977-97 ¹⁵	Type 3 if Receiving Water Monitoring Trigger is exceeded	5	Mg/L	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT), ¹⁶ fixed-count of 600 org/sample	Type 3 LUPs > 30 acres	N/A	N/A	N/A	N/A

i. LUP Type 2 & 3 Monitoring Methods

- i The LUP Type 2 or 3 discharger's project M&RP shall include a description of the following items:

- (1) Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

¹⁴ Additional information regarding SWAMP's QAPrP can be found at: http://www.waterboards.ca.gov/water_issues/programs/swamp/.

¹⁵ ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394

¹⁶ The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

- (2) Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program a copy of the Chain of Custody form used when handling and shipping samples.
 - (3) Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section M.4.f above.
- ii LUP Type 2 & 3 dischargers shall ensure that all sampling and sample preservation be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. All laboratory analyses shall be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses shall be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). The LUP discharger shall conduct its own field analysis of pH and may conduct its own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.
- j. LUP Type 2 & 3 Analytical Methods

LUP Type 2 & 3 dischargers shall refer to Table 5 above for test Methods, detection Limits, and reporting Units.

- i **pH:** LUP Type 2 & 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or pH test kit. The LUP discharger shall record pH monitoring results on paper and retain these records in accordance with Section M.4.o, below.
- ii **Turbidity:** LUP Type 2 & 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results shall

be recorded in the site log book in Nephelometric Turbidity Units (NTU).

- iii **Suspended sediment concentration (SSC):** LUP Type 3 dischargers exceeding the turbidity Receiving Water Monitoring Trigger, shall perform SSC analysis using ASTM Method D3977-97.
- iv **Bioassessment:** LUP Type 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

k. Watershed Monitoring Option

If an LUP Type 2 or 3 discharger is part of a qualified regional watershed-based monitoring program the LUP Type 2 or 3 discharger may be eligible for relief from the monitoring requirements in this Attachment. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program if it determines that the watershed-based monitoring program will provide information to determine each discharger's compliance with the requirements of this General Permit.

l. Particle Size Analysis for Risk Justification

LUP Type 2 & 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

m. NAL Exceedance Report

- i In the event that any effluent sample exceeds an applicable NAL, the Regional Water Boards may require LUP Type 2 & 3 dischargers to submit NAL Exceedance Reports.
- ii LUP Type 2 & 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.
- iii LUP Type 2 & 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the exceedance report is filed.
- iv LUP Type 2 & 3 dischargers shall include in the NAL Exceedance Report:

- (1) the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”); and
- (2) the date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
- (3) Description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

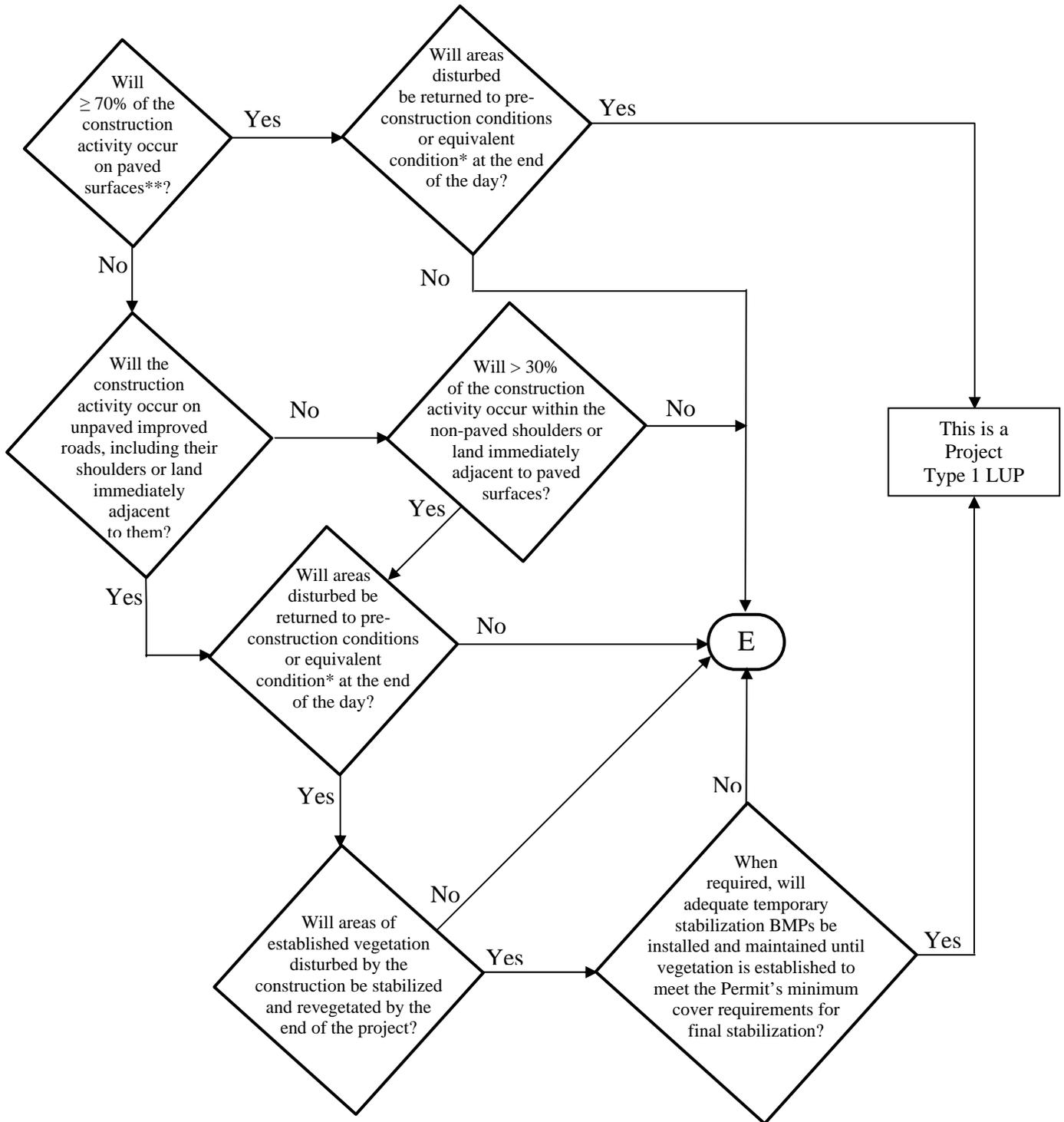
n. Monitoring Records

LUP Type 2 & 3 dischargers shall ensure that records of all storm water monitoring information and copies of all reports (including Annual Reports) required by this General Permit be retained for a period of at least three years. LUP Type 2 & 3 dischargers may retain records off-site and make them available upon request. These records shall include:

- i The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge);
- ii The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;
- iii The date and approximate time of analyses;
- iv The individual(s) who performed the analyses;
- v A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and all chain of custody forms;
- vi Quality assurance/quality control records and results;
- vii Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Section M.4.a above);
- viii Visual observation and sample collection exception records (see Section M.4.g above); and

- ix The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

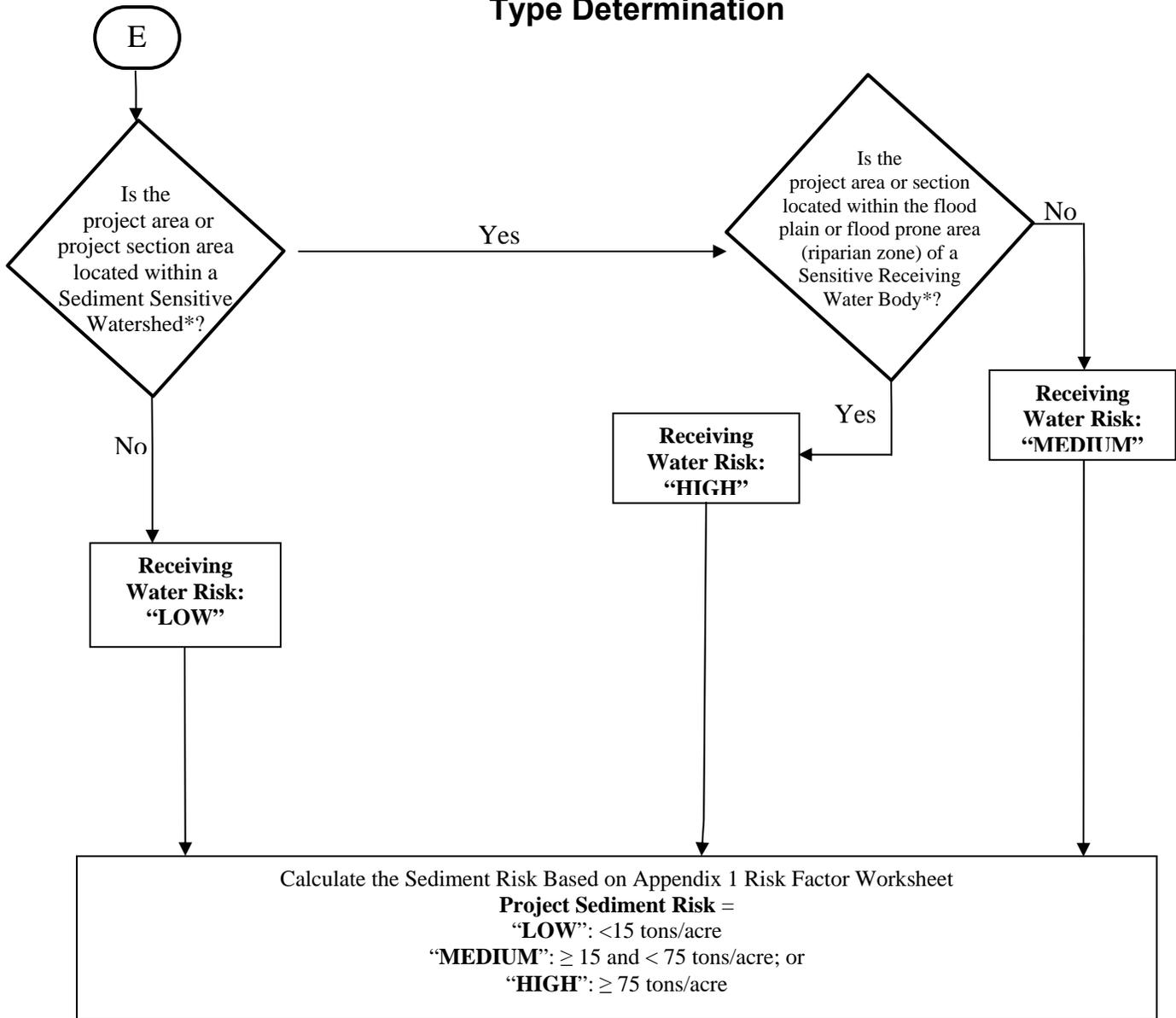
ATTACHMENT A.1 LUP Project Area or Project Section Area Type Determination



*See Definition of Terms

** Or: "Will < 30% of the soil disturbance occur on unpaved surfaces?"

ATTACHMENT A.1 LUP Project Area or Project Section Area Type Determination



* See Definition of Terms

		<u>PROJECT SEDIMENT RISK</u>		
		LOW	MEDIUM	HIGH
<u>RECEIVING WATER RISK</u>	LOW	Type 1	Type 1	Type 2
	MEDIUM	Type 1	Type 2	Type 3
	HIGH	Type 2	Type 3	Type 3

ATTACHMENT A.1 Definition of Terms

1. **Equivalent Condition** – Means disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.
2. **Linear Construction Activity** – Linear construction activity consists of underground/ overhead facilities that typically include, but are not limited to, any conveyance, pipe or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/ tower pad and cable/ wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/ borrow locations.
3. **Sediment Sensitive Receiving Water Body** – Defined as a water body segment that is listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or is designated with beneficial uses of SPAWN, MIGRATORY, and COLD.
4. **Sediment Sensitive Watershed** – Defined as a watershed draining into a receiving water body listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or a water body designated with beneficial uses of SPAWN, MIGRATORY, and COLD.

**ATTACHMENT A.2
PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS FOR LINEAR UNDERGROUND/OVERHEAD PROJECTS TO
COMPLY WITH THE CONSTRUCTION GENERAL PERMIT**

GENERAL INSTRUCTIONS

Who Must Submit

This permit is effective on July 1, 2010.

The Legally Responsible Person (LRP) for construction activities associated with linear underground/overhead project (LUP) must electronically apply for coverage under this General Permit on or after July 1, 2010. If it is determined that the LUP construction activities require an NPDES permit, the Legally Responsible Person¹ (LRP) shall submit PRDs for this General Permit in accordance with the following:

LUPs associated with Private or Municipal Development Projects

1. For LUPs associated with pre-development and pre-redevelopment construction activities:

The LRP must obtain coverage² under this General Permit for its pre-development and pre-redevelopment construction activities where the total disturbed land area of these construction activities is greater than 1 acre.

2. For LUPs associated with new development and redevelopment construction projects:

The LRP must obtain coverage under this General Permit for LUP construction activities associated with new development and redevelopment projects where the total disturbed land area of the LUP is greater than 1 acre. Coverage under this permit is not required where the same LUP construction activities are covered by another NPDES permit.

LUPs not associated with private or municipal new development or redevelopment projects:

The LRP must obtain coverage under this General Permit on or after July 1, 2010 for its LUP construction activities where the total disturbed land area is greater than 1 acre.

PRD Submittal Requirements

Prior to the start of construction activities a LRP must submit PRDs and fees to the State Water Board for each LUP.

New and Ongoing LUPs

Dischargers of new LUPs that commence construction activities after the adoption date of this General Permit shall file PRDs prior to the commencement of construction and implement the SWPPP upon the start of construction.

¹ person possessing the title of the land on which the construction activities will occur for the regulated site

² obtain coverage means filing PRDs for the project.

PERMIT REGISTRATION DOCUMENTS (PRDs) GENERAL INSTRUCTIONS (CONTINUED)

Dischargers of ongoing LUPs that are currently covered under State Water Board Order No. 2003-0007 (Small LUP General Permit) shall electronically file Permit Registration Documents no later than July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 2003-0007-DWQ will be terminated. All existing dischargers shall be exempt from the risk determination requirements in Attachment A. All existing dischargers are therefore subject to LUP Type 1 requirements regardless of their project's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the risk determination requirements in Attachment A.

Where to Apply

The Permit Registration Documents (PRDs) can be found at www.waterboards.ca.gov/water_issues/programs/stormwater/

Fees

The annual fee for storm water permits are established through the State of California Code of Regulations.

When Permit Coverage Commences

To obtain coverage under the General Permit, the LRP must include the complete PRDs and the annual fee. All PRDs deemed incomplete will be rejected with an explanation as to what is required to complete submittal. Upon receipt of complete PRDs and associated fee, each discharger will be sent a waste discharger's identification (WDID) number.

Projects and Activities Not Defined As Construction Activity

1. LUP construction activity does not include routine maintenance projects to maintain original line and grade, hydraulic capacity, or original purpose of the facility. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:
 - Maintain the original purpose of the facility, or hydraulic capacity.
 - Update existing lines³ and facilities to comply with applicable codes, standards and regulations regardless if such projects result in increased capacity.
 - Repairing leaks.

Routine maintenance does not include construction of new⁴ lines or facilities resulting from compliance with applicable codes, standards and regulations.

³ Update existing lines includes replacing existing lines with new materials or pipes.

⁴ New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

**PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)**

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must acquire new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

2. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).
3. Tie-ins conducted immediately adjacent to “energized” or “pressurized” facilities by the discharger are not considered small construction activities where all other LUP construction activities associated with the tie-in are covered by a NOI and SWPPP of a third party or municipal agency.

Calculating Land Disturbance Areas of LUPs

The total land area disturbed for LUPs is the sum of the:

- Surface areas of trenches, laterals and ancillary facilities, plus
- Area of the base of stockpiles on unpaved surfaces, plus
- Surface area of the borrow area, plus
- Areas of paved surfaces constructed for the project, plus
- Areas of new roads constructed or areas of major reconstruction to existing roads (e.g. improvements to two-track surfaces or road widening) for the sole purpose of accessing construction activities or as part of the final project, plus
- Equipment and material storage, staging, and preparation areas (laydown areas) not on paved surfaces, plus
- Soil areas outside the surface area of trenches, laterals and ancillary facilities that will be graded, and/or disturbed by the use of construction equipment, vehicles and machinery during construction activities.

Stockpiling Areas

Stockpiling areas, borrow areas and the removal of soils from a construction site may or may not be included when calculating the area of disturbed soil for a site depending on the following conditions:

- For stockpiling of soils onsite or immediately adjacent to a LUP site and the stockpile is not on a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation.
- The surface area of borrow areas that are onsite or immediately adjacent to a project site are to be included in the disturbed area calculation.
- For soil that is hauled offsite to a location owned or operated by the discharger that is not a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

**PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)**

- For soil that is brought to the project from an off-site location owned or operated by the discharger the surface area of the borrow pit is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.
- Trench spoils on a paved surface that are either returned to the trench or excavation or hauled away from the project daily for disposal or reuse will not be included in the disturbed area calculation.

If you have any questions concerning submittal of PRDs, please call the State Water Board at (866) 563-3107.

**ATTACHMENT B
PERMIT REGISTRATION DOCUMENTS (PRDs) TO COMPLY WITH THE TERMS
OF THE GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY**

GENERAL INSTRUCTIONS

- A.** All Linear Construction Projects shall comply with the PRD requirements in Attachment A.2 of this Order.

B. Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Storm Water Permit (General Permit). Any construction activity that is a part of a larger common plan of development or sale must also be permitted, regardless of size. (For example, if 0.5 acre of a 20-acre subdivision is disturbed by the construction activities of discharger A and the remaining 19.5 acres is to be developed by discharger B, discharger A must obtain a General Storm Water Permit for the 0.5 acre project).

Other discharges from construction activities that are covered under this General Permit can be found in the General Permit Section II.B.

It is the LRP's responsibility to obtain coverage under this General Permit by electronically submitting complete PRDs (Permit Registration Documents).

In all cases, the proper procedures for submitting the PRDs must be completed before construction can commence.

C. Construction Activity Not Covered By This General Permit

Discharges from construction that are not covered under this General Permit can be found in the General Permit Sections II.A & B..

D. Annual Fees and Fee Calculation

Annual fees are calculated based upon the total area of land to be disturbed not the total size of the acreage owned. However, the calculation includes all acres to be disturbed during the duration of the project. For example, if 10 acres are scheduled to be disturbed the first year and 10 in each subsequent year for 5 years, the annual fees would be based upon 50 acres of disturbance. The State Water Board will evaluate adding acreage to an existing Permit Waste Discharge Identification (WDID) number on a case-by-case basis. In general, any acreage to be considered must be contiguous to the permitted land area and the existing

SWPPP must be appropriate for the construction activity and topography of the acreage under consideration. As acreage is built out and stabilized or sold, the Change of Information (COI) form enables the applicant to remove those acres from inclusion in the annual fee calculation. Checks should be made payable to: State Water Board.

The Annual fees are established through regulations adopted by the State Water Board. The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI, based on the total acreage to be disturbed during the life of the project. Annual fees are subject to change by regulation.

Dischargers that apply for and satisfy the Small Construction Erosivity Waiver requirements shall pay a fee of \$200.00 plus an applicable surcharge, see the General Permit Section II.B.7.

E. When to Apply

LRP's proposing to conduct construction activities subject to this General Permit must submit their PRDs prior to the commencement of construction activity.

F. Requirements for Completing Permit Registration Documents (PRDs)

All dischargers required to comply with this General Permit shall electronically submit the required PRDs for their type of construction as defined below.

G. Standard PRD Requirements (All Dischargers)

1. Notice of Intent
2. Risk Assessment (Standard or Site-Specific)
3. Site Map
4. SWPPP
5. Annual Fee
6. Certification

H. Additional PRD Requirements Related to Construction Type

1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:
 - a. Post-Construction Water Balance Calculator (Appendix 2).
2. Dischargers who are proposing to implement ATS shall submit:
 - a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.

- b. Certification proof that design done by a professional in accordance with Attachment F.
- 3. Dischargers who are proposing an alternate Risk Justification:
 - a. Particle Size Analysis.

I. Exceptions to Standard PRD Requirements

Construction sites with an R value less than 5 as determined in the Risk Assessment are not required to submit a SWPPP.

J. Description of PRDs

1. Notice of Intent (NOI)
2. Site Map(s) Includes:
 - a. The project's surrounding area (vicinity)
 - b. Site layout
 - c. Construction site boundaries
 - d. Drainage areas
 - e. Discharge locations
 - f. Sampling locations
 - g. Areas of soil disturbance (temporary or permanent)
 - h. Active areas of soil disturbance (cut or fill)
 - i. Locations of all runoff BMPs
 - j. Locations of all erosion control BMPs
 - k. Locations of all sediment control BMPs
 - l. ATS location (if applicable)
 - m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
 - n. Locations of all post-construction BMPs
 - o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices
3. **SWPPPs**
A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.
4. **Risk Assessment**
All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1.
 - a. The Standard Risk Assessment includes utilization of the following:
 - i. Receiving water Risk Assessment interactive map

- ii. EPA Rainfall Erosivity Factor Calculator Website
 - iii. Sediment Risk interactive map
 - iv. Sediment sensitive water bodies list
- b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator
5. **Post-Construction Water Balance Calculator**
All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.
6. **ATS Design Document and Certification**
All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (See Attachment F).

To obtain coverage under the General Permit PRDs must be included and completed. If any of the required items are missing, the PRD submittal is considered incomplete and will be rejected. Upon receipt of a complete PRD submittal, the State Water Board will process the application package in the order received and assign a (WDID) number.

Questions?

If you have any questions on completing the PRDs please email stormwater@waterboards.ca.gov or call (866) 563-3107.

ATTACHMENT C RISK LEVEL 1 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:
 - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
 - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:
 - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
 - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
 - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
 - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
 - d. Cover waste disposal containers at the end of every business day and during a rain event.
 - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
 - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
 - g. Implement procedures that effectively address hazardous and non-hazardous spills.
 - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
 - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

- ii. Appropriate spill response personnel are assigned and trained.
 - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
 - a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
 - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
 - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
 - a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
 - b. Contain fertilizers and other landscape materials when they are not actively being used.
 - c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
 - d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
 - e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
 - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
 - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
 - d. Ensure retention of sampling, visual observation, and inspection records.
 - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

C. Non-Storm Water Management

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.
3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 1 dischargers shall implement effective wind erosion control.
2. Risk Level 1 dischargers shall provide effective soil cover for inactive¹ areas and all finished slopes, open space, utility backfill, and completed lots.
3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

F. Run-on and Runoff Controls

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

¹ Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
 - a. Inspection date and date the inspection report was written.
 - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
 - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
 - d. A description of any BMPs evaluated and any deficiencies noted.
 - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
 - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
 - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
 - h. Photographs taken during the inspection, if any.
 - i. Inspector's name, title, and signature.

H. Rain Event Action Plan

Not required for Risk Level 1 dischargers.

I. Risk Level 1 Monitoring and Reporting Requirements

Table 1- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
 - c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and
 - d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.
- 3. Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**
- a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
 - b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
 - c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.
 - d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
 - e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):
 - i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.
 - ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

- iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. Risk Level 1 – Visual Observation Exemptions

- a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:
 - i. During dangerous weather conditions such as flooding and electrical storms.
 - ii. Outside of scheduled site business hours.
- b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

5. Risk Level 1 – Monitoring Methods

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

6. Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements

- a. Visual Monitoring Requirements:
 - i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
 - ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
 - iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

7. Risk Level 1 – Non-Visible Pollutant Monitoring Requirements

- a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.
- b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

- f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.
- g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.²
- h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

8. Risk Level 1 – Particle Size Analysis for Project Risk Justification

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

9. Risk Level 1 – Records

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.
- d. The individual(s) who performed the analyses.

² For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.
- f. Rain gauge readings from site inspections.
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).
- i. Visual observation and sample collection exception records (see Section I.4 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT D RISK LEVEL 2 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 2 dischargers shall comply with the narrative effluent standards listed below:
 - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
 - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric – Risk level 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 2 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 2 dischargers shall implement the following good housekeeping measures:
 - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
 - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 2 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
 - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
 - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
 - d. Cover waste disposal containers at the end of every business day and during a rain event.
 - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
 - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
 - g. Implement procedures that effectively address hazardous and non-hazardous spills.
 - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require:
 - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly.

- ii. Appropriate spill response personnel are assigned and trained.
 - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
- 3. Risk Level 2 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
 - a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
 - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
 - c. Clean leaks immediately and disposing of leaked materials properly.
- 4. Risk Level 2 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
 - a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
 - b. Contain all fertilizers and other landscape materials when they are not actively being used.
 - c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
 - d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
 - e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.
- 5. Risk Level 2 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 2 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
 - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
 - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
 - d. Ensure retention of sampling, visual observation, and inspection records.
 - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 2 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.
7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 2 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 2 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 2 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 2 dischargers shall implement effective wind erosion control.
2. Risk Level 2 dischargers shall provide effective soil cover for inactive¹ areas and all finished slopes, open space, utility backfill, and completed lots.
3. Risk Level 2 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 2 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 2 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.
3. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active² construction.
4. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths³ in accordance with Table 1.

¹ Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

² Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage.

³ Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.
6. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

F. Run-on and Run-off Controls

Risk Level 2 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 2 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).
2. Risk Level 2 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 2 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 2 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 2 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
 - a. Inspection date and date the inspection report was written.
 - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
 - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
 - d. A description of any BMPs evaluated and any deficiencies noted.
 - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
 - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
 - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
 - h. Photographs taken during the inspection, if any.
 - i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any

likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The discharger shall ensure a QSP obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).

2. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).
3. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:
 - a. Site Address
 - b. Calculated Risk Level (2 or 3)
 - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number
 - d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
 - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
4. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP include in the REAP, at a minimum, the following project phase information:
 - a. Activities associated with each construction phase
 - b. Trades active on the construction site during each construction phase
 - c. Trade contractor information
 - d. Suggested actions for each project phase
5. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:
 - a. Site Address
 - b. Calculated Risk Level (2 or 3)
 - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number

- d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
 - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
 - f. Trades active on site during Inactive Construction
 - g. Trade contractor information
 - h. Suggested actions for inactive construction sites
6. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.
7. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 2 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
2	X	X	X	X	X	X	

1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs).

- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.
 - c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.
 - d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.
- 3. Risk Level 2 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**
- a. Risk Level 2 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
 - b. Risk Level 2 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
 - c. Risk Level 2 dischargers shall conduct visual observations (inspections) during business hours only.
 - d. Risk Level 2 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
 - e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 2 dischargers shall visually observe (inspect):
 - i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.
 - ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

- iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in c.i and c.iii above, Risk Level 2 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 2 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 2 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. Risk Level 2 – Water Quality Sampling and Analysis

- a. Risk Level 2 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.
- b. At minimum, Risk Level 2 dischargers shall collect 3 samples per day of the qualifying event.
- c. Risk Level 2 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

Storm Water Effluent Monitoring Requirements

- d. Risk Level 2 dischargers shall analyze their effluent samples for:
 - i. pH and turbidity.
 - ii. Any additional parameters for which monitoring is required by the Regional Water Board.

5. Risk Level 2 – Storm Water Discharge Water Quality Sampling Locations

Effluent Sampling Locations

- a. Risk Level 2 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.
- b. Risk Level 2 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.
- c. Risk Level 2 dischargers shall ensure that storm water discharge collected and observed represent⁴ the effluent in each drainage area based on visual observation of the water and upstream conditions.
- d. Risk Level 2 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.
- e. Risk Level 2 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.
- f. Risk Level 2 dischargers shall select analytical test methods from the list provided in Table 3 below.
- g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 “Storm Water Sample Collection and Handling Instructions” below.

6. Risk Level 2 – Visual Observation and Sample Collection Exemptions

- a. Risk Level 2 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 2 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

⁴ For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment-laden water even if most water flowing through the fence is clear.

- i. During dangerous weather conditions such as flooding and electrical storms.
 - ii. Outside of scheduled site business hours.
- b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 2 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.
- 7. Risk Level 2 – Storm Water Sample Collection and Handling Instructions**
- a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.
 - b. Risk Level 2 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.
 - c. Risk Level 2 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).⁵

8. Risk Level 2 – Monitoring Methods

- a. Risk Level 2 dischargers shall include a description of the following items in the CSMP:
 - i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.
 - ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program

⁵ Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/.
QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf.

an example Chain of Custody form used when handling and shipping samples.

- iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.
- b. Risk Level 2 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 2 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services. Risk Level 2 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. Risk Level 2 – Analytical Methods

- a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.
- b. **pH:** Risk Level 2 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 2 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.
- c. **Turbidity:** Risk Level 2 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

10. Risk Level 2 - Non-Storm Water Discharge Monitoring Requirements

- a. Visual Monitoring Requirements:
 - i. Risk Level 2 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
 - ii. Risk Level 2 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
 - iii. Risk Level 2 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 2 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.
- b. Effluent Sampling Locations:
 - i. Risk Level 2 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.
 - ii. Risk Level 2 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.
 - iii. Risk Level 2 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. Risk Level 2 – Non-Visible Pollutant Monitoring Requirements

- a. Risk Level 2 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual

inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

- b. Risk Level 2 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 2 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 2 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 2 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 2 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).
- f. Risk Level 2 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.
- g. Risk Level 2 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.⁶
- h. Risk Level 2 dischargers shall keep all field /or analytical data in the SWPPP document.

12. Risk Level 2 – Watershed Monitoring Option

Risk Level 2 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

⁶ For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

13. Risk Level 2 – Particle Size Analysis for Project Risk Justification

Risk Level 2 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. Risk Level 2 – Records

Risk Level 2 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 2 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.
- d. The individual(s) who performed the analyses.
- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.
- f. Rain gauge readings from site inspections;
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).
- i. Visual observation and sample collection exception records (see Section I.6 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. Risk Level 2 – NAL Exceedance Report

- a. In the event that any effluent sample exceeds an applicable NAL, Risk Level 2 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.
- b. Risk Level 2 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.
- c. Risk Level 2 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.
- d. Risk Level 2 dischargers shall include in the NAL Exceedance Report:
 - i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).
 - ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
 - iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

Table 3 – Risk Level 2 Test Methods, Detection Limits, Reporting Units and Applicable NALs/NELs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2 Discharges other than ATS	1	NTU	250 NTU
		For ATS discharges	1	NTU	N/A

ATTACHMENT E RISK LEVEL 3 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 3 dischargers shall comply with the narrative effluent standards listed below:
 - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
 - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric –Risk Level 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 3 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 3 dischargers shall implement the following good housekeeping measures:
 - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
 - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 3 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
 - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
 - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
 - d. Cover waste disposal containers at the end of every business day and during a rain event.
 - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
 - f. Contain and securely protecting stockpiled waste material from wind and rain at all times unless actively being used.
 - g. Implement procedures that effectively address hazardous and non-hazardous spills.
 - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
 - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

- ii. Appropriate spill response personnel are assigned and trained.
 - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 3 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
- a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
 - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
 - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 3 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
- a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
 - b. Contain fertilizers and other landscape materials when they are not actively being used.
 - c. Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
 - d. Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
 - e. Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 3 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 3 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
 - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
 - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
 - d. Ensure retention of sampling, visual observation, and inspection records.
 - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 3 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.
7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 3 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 3 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 3 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 3 dischargers shall implement effective wind erosion control.
2. Risk Level 3 dischargers shall provide effective soil cover for inactive¹ areas and all finished slopes, open space, utility backfill, and completed lots.
3. Dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 3 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 3 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.
3. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active² construction.
4. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths³ in accordance with Table 1.

¹ Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

² Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage

³ Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.
6. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).
8. **Additional Risk Level 3 Requirement:** The Regional Water Board may require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

F. Run-on and Run-off Controls

Risk Level 3 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 3 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 3 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.
3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 3 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 3 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 3 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
 - a. Inspection date and date the inspection report was written.
 - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
 - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
 - d. A description of any BMPs evaluated and any deficiencies noted.
 - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
 - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
 - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
 - h. Photographs taken during the inspection, if any.

- i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The QSP shall obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).
2. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).
3. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:
 - a. Site Address.
 - b. Calculated Risk Level (2 or 3).
 - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
 - d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
 - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
4. **Additional Risk Level 3 Requirement:** The QSP shall include in the REAP, at a minimum, the following project phase information:
 - a. Activities associated with each construction phase.
 - b. Trades active on the construction site during each construction phase.
 - c. Trade contractor information.
 - d. Suggested actions for each project phase.
5. **Additional Risk Level 3 Requirement:** The QSP shall develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

- a. Site Address.
 - b. Calculated Risk Level (2 or 3).
 - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
 - d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
 - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
 - f. Trades active on site during Inactive Construction.
 - g. Trade contractor information.
 - h. Suggested actions for inactive construction sites.
6. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.
7. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 3 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
3	X	X	X	X	X	X	X⁴

1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Program in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

⁴ When receiving water monitoring trigger is exceeded

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of this General Permit.
 - b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.
 - c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.
 - d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.
- 3. Risk Level 3 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**
- a. Risk Level 3 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
 - b. Risk Level 3 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
 - c. Risk Level 3 dischargers shall conduct visual observations (inspections) during business hours only.
 - d. Risk Level 3 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
 - e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 3 dischargers shall visually observe (inspect):
 - i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

- ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.
 - iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in c.i. and c.iii above, Risk Level 3 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
 - g. Within two business days (48 hours) after each qualifying rain event, Risk Level 3 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
 - h. Risk Level 3 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. Risk Level 3 – Water Quality Sampling and Analysis

- a. Risk Level 3 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.
- b. At minimum, Risk Level 3 dischargers shall collect 3 samples per day of the qualifying event.
- c. Risk Level 3 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

Storm Water Effluent Monitoring Requirements

- d. Risk Level 3 dischargers shall analyze their effluent samples for:
 - i. pH and turbidity.

- ii. Any additional parameters for which monitoring is required by the Regional Water Board.
- e. Risk 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event.

Receiving Water Monitoring Requirements

- f. In the event that a Risk Level 3 discharger's effluent exceeds the daily average receiving water monitoring trigger of 500 NTU turbidity or the daily average pH range 6.0-9.0 contained in this General Permit and has a direct discharge into receiving waters, the Risk Level 3 discharger shall subsequently sample receiving waters (RWs) for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit. If a Risk Level 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.
 - g. Risk Level 3 dischargers disturbing 30 acres or more of the landscape and with direct discharges into receiving waters shall conduct or participate in benthic macroinvertebrate bioassessment of RWs prior to commencement of construction activity (See Appendix 3).
 - h. Risk Level 3 dischargers shall obtain RW samples in accordance with the Receiving Water sampling location section (Section I.5), below.
- 5. Risk Level 3 – Storm Water Discharge Water Quality Sampling Locations**

Effluent Sampling Locations

- a. Risk Level 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.
- b. Risk Level 3 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

- c. Risk Level 3 dischargers shall ensure that storm water discharge collected and observed represent⁵ the effluent in each drainage area based on visual observation of the water and upstream conditions.
- d. Risk Level 3 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.
- e. Risk Level 3 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.
- f. Risk Level 3 dischargers shall select analytical test methods from the list provided in Table 3 below.
- g. All storm water sample collection preservation and handling shall be conducted in accordance with Section 1.7 “Storm Water Sample Collection and Handling Instructions” below.

Receiving Water Sampling Locations

- h. **Upstream/up-gradient RW samples:** Risk Level 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible and upstream from the effluent discharge point.
- i. **Downstream/down-gradient RW samples:** Risk Level 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible and downstream from the effluent discharge point.
- j. If two or more discharge locations discharge to the same receiving water, Risk Level 3 dischargers may sample the receiving water at a single upstream and downstream location.

⁵ For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment-laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment laden water even if most water flowing through the fence is clear.

6. Risk Level 3 – Visual Observation and Sample Collection Exemptions

- a. Risk Level 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 3 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:
 - i. During dangerous weather conditions such as flooding and electrical storms.
 - ii. Outside of scheduled site business hours.
- b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 3 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. Risk Level 3 – Storm Water Sample Collection and Handling Instructions

- a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.
- b. Risk Level 3 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.
- c. Risk Level 3 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).⁶

⁶ Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/.

QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf

8. Risk Level 3 – Monitoring Methods

- a. Risk Level 3 dischargers shall include a description of the following items in the CSMP:
 - i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.
 - ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program an example Chain of Custody form used when handling and shipping samples.
 - iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.
- b. Risk Level 3 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 3 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). Risk Level 3 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. Risk Level 3 – Analytical Methods

- a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

- b. **pH:** Risk Level 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 3 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.
- c. **Turbidity:** Risk Level 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).
- d. **Suspended sediment concentration (SSC):** Risk Level 3 dischargers that exceed the turbidity Receiving Water Monitoring Trigger shall perform SSC analysis using ASTM Method D3977-97.
- e. **Bioassessment:** Risk Level 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

10. Risk Level 3 - Non-Storm Water Discharge Monitoring Requirements

- a. Visual Monitoring Requirements:
 - i. Risk Level 3 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
 - ii. Risk Level 3 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
 - iii. Risk Level 3 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 3 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to

reduce or prevent pollutants from contacting non-storm water discharges.

- b. Effluent Sampling Locations:
 - i. Risk Level 3 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.
 - ii. Risk Level 3 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.
 - iii. Risk Level 3 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. Risk Level 3 – Non-Visible Pollutant Monitoring Requirements

- a. Risk Level 3 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.
- b. Risk Level 3 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 3 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 3 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 3 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).
- f. Risk Level 3 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

- g. Risk Level 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.⁷
- h. Risk Level 3 dischargers shall keep all field /or analytical data in the SWPPP document.

12. Risk Level 3 – Watershed Monitoring Option

Risk Level 3 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

13. Risk Level 3 – Particle Size Analysis for Project Risk Justification

Risk Level 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. Risk Level 3 – Records

Risk Level 3 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 3 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.

⁷ For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

- d. The individual(s) who performed the analyses.
- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.
- f. Rain gauge readings from site inspections.
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).
- i. Visual observation and sample collection exception records (see Section I.6 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. Risk Level 3 – NAL Exceedance Report

- a. Risk Level 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.
- b. Risk Level 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity In this General Permit.
- c. Risk Level 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.
- d. Risk Level 3 dischargers shall include in the NAL Exceedance Report:
 - i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).

- ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
- iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

16. Risk Level 3 – Bioassessment

- a. Risk Level 3 dischargers with a total project-related ground disturbance exceeding 30 acres shall:
 - i. Conduct bioassessment monitoring, as described in Appendix 3.
 - ii. Include the collection and reporting of specified in stream biological data and physical habitat.
 - iii. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).⁸
- b. Risk Level 3 dischargers qualifying for bioassessment, where construction commences out of an index period for the site location shall:
 - i. Receive Regional Board approval for the sampling exception.
 - ii. Conduct bioassessment monitoring, as described in Appendix 3.
 - iii. Include the collection and reporting of specified instream biological data and physical habitat.
 - iv. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).

OR

- v. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.

⁸ http://www.waterboards.ca.gov/water_issues/programs/swamp/.

- vi. Send a copy of the check to the Regional Water Board office for the site's region.
- vii. Invest **\$7,500.00 X The number of samples required** into the SWAMP program as compensation (upon regional board approval).

Table 3 – Risk Level 3 Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level	Numeric Effluent Limitation	Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Risk Level 3 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5	N/A	lower limit = 6.0 upper limit = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 3 Discharges other than ATS	1	NTU	250 NTU	N/A	500 NTU
		For ATS discharges	1	NTU	N/A	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample
SSC	ASTM Method D 3977-97 ⁹	Risk Level 3 (if Receiving Water Monitoring Trigger exceeded)	5	mg/L	N/A	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT), ¹⁰ fixed-count of 600 org/sample	Risk Level 3 projects > 30 acres	N/A	N/A	N/A	N/A	N/A

⁹ ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394.

¹⁰ The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

ATTACHMENT F: Active Treatment System (ATS) Requirements

Table 1 – Numeric Effluent Limitations, Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level	Numeric Effluent Limitation
Turbidity	EPA 0180.1 and/or field test with a calibrated portable instrument	For ATS discharges	1	NTU	N/A	10 NTU for Daily Flow-Weighted Average & 20 NTU for Any Single Sample

A. Dischargers choosing to implement an Active Treatment System (ATS) on their site shall comply with all of the requirements in this Attachment.

B. The discharger shall maintain a paper copy of each ATS specification onsite in compliance with the record retention requirements in the Special Provisions of this General Permit.

C. ATS Design, Operation and Submittals

1. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.
2. The discharger shall ensure that the ATS is designed in a manner to preclude the accidental discharge of settled floc¹ during floc pumping or related operations.
3. The discharger shall design outlets to dissipate energy from concentrated flows.
4. The discharger shall install and operate an ATS by assigning a lead person (or project manager) who has either a minimum of five years construction storm

¹ Floc is defined as a clump of solids formed by the chemical action in ATS systems.

water experience or who is a licensed contractors specifically holding a California Class A Contractors license.²

5. The discharger shall prepare an ATS Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the State Water Board at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:
 - a. ATS Operation and Maintenance Manual for All Equipment.
 - b. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC).
 - c. ATS Health and Safety Plan.
 - d. ATS Spill Prevention Plan.
6. The ATS shall be designed to capture and treat (within a 72-hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0.

D. Treatment – Chemical Coagulation/Flocculation

1. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003).
2. The discharger shall conduct, at minimum, six site-specific jar tests (per polymer with one test serving as a control) for each project to determine the proper polymer and dosage levels for their ATS.
3. Single field jar tests may also be conducted during a project if conditions warrant, for example if construction activities disturb changing types of soils, which consequently cause change in storm water and runoff characteristics.

E. Residual Chemical and Toxicity Requirements

1. The discharger shall utilize a residual chemical test method that has a method detection limit (MDL) of 10% or less than the maximum allowable threshold

² Business and Professions Code Division 3, Chapter 9, Article 4, Class A Contractor: A general engineering contractor is a contractor whose principal contracting business is in connection with fixed works requiring specialized engineering knowledge and skill. [<http://www.cslb.ca.gov/General-Information/library/licensing-classifications.asp>].

concentration³ (MATC) for the specific coagulant in use and for the most sensitive species of the chemical used.

2. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.
3. The discharger shall have a California State certified laboratory validate the selected residual chemical test. Specifically the lab will review the test protocol, test parameters, and the detection limit of the coagulant. The discharger shall electronically submit this documentation as part of the ATS Plan.
4. If the discharger cannot utilize a residual chemical test method that meets the requirements above, the discharger shall operate the ATS in Batch Treatment⁴ mode.
5. A discharger planning to operate in Batch Treatment mode shall perform toxicity testing in accordance with the following:
 - a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge⁵. All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.⁶
 - b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas* (fathead minnow). Acute toxicity for *Oncorhynchus mykiss* (Rainbow Trout) may be used as a substitute for testing fathead minnows.
 - c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.
 - d. The discharger shall electronically report all acute toxicity testing.

³ The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be: The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

⁴ Batch Treatment mode is defined as holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full.

⁵ This requirement only requires that the test be initiated prior to discharge.

⁶ http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.

F. Filtration

1. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters, which are sized to capture suspended material that might pass through the clarifier tanks.
2. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

G. Residuals Management

1. Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (i.e., volume) capability.
2. Handling and disposal of all solids generated during ATS operations shall be done in accordance with all local, state, and federal laws and regulations.

H. ATS Instrumentation

1. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.
2. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements below, and shall include:
 - a. Influent Turbidity
 - b. Effluent Turbidity
 - c. Influent pH
 - d. Effluent pH
 - e. Residual Chemical
 - f. Effluent Flow rate
 - g. Effluent Flow volume
3. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.

4. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days continuous data.
5. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH.
6. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.
7. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the QA/QC plan.
8. The QA/QC plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.
9. The instrumentation system shall include a method for controlling coagulant dose, to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.

I. ATS Effluent Discharge

1. ATS effluent shall comply with all provisions and prohibitions in this General Permit, specifically the NELs.
2. NELs for discharges from an ATS:
 - a. Turbidity of all ATS discharges shall be less than 10 NTU for daily flow-weighted average of all samples and 20 NTU for any single sample.
 - b. Residual Chemical shall be < 10% of MATC⁷ for the most sensitive species of the chemical used.

⁷ The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

3. If an analytical effluent sampling result exceeds the turbidity NEL (as listed in Table 1), the discharger is in violation of this General Permit and shall electronically file the results in violation within 24-hours of obtaining the results.
4. If ATS effluent is authorized to discharge into a sanitary sewer system, the discharger shall comply with any pre-treatment requirements applicable for that system. The discharger shall include any specific criteria required by the municipality in the ATS Plan.
5. Compliance Storm Event:

Discharges of storm water from ATS shall comply with applicable NELs (above) unless the storm event causing the discharges is determined after the fact to be equal to or larger than the Compliance Storm Event (expressed in inches of rainfall). The Compliance Storm Event for ATS discharges is the 10 year, 24 hour storm, as determined using these maps:

<http://www.wrcc.dri.edu/pcpnfreq/nca10y24.gif>
<http://www.wrcc.dri.edu/pcpnfreq/sca10y24.gif>

This exemption is dependent on the submission of rain gauge data verifying the storm event is equal to or larger than the Compliance Storm.

J. Operation and Maintenance Plan

1. Each Project shall have a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS.⁸
2. The O&M Manual shall only be used in conjunction with appropriate project-specific design specifications that describe the system configuration and operating parameters.
3. The O&M Manual shall have operating manuals for specific pumps, generators, control systems, and other equipment.

K. Sampling and Reporting Quality Assurance/ Quality Check (QA/QC) Plan

4. A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:
 - a. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.

⁸ The manual is typically in a modular format covering generalized procedures for each component that is utilized in a particular system.

- b. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.
- c. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

L. Personnel Training

- 1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.
- 2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.
- 3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:
 - a. Coagulation Basics –Chemistry and physical processes
 - b. ATS System Design and Operating Principles
 - c. ATS Control Systems
 - d. Coagulant Selection – Jar testing, dose determination, etc.
 - e. Aquatic Safety/Toxicity of Coagulants, proper handling and safety
 - f. Monitoring, Sampling, and Analysis
 - g. Reporting and Recordkeeping
 - h. Emergency Response

M. Active Treatment System (ATS) Monitoring Requirements

Any discharger who deploys an ATS on their site shall conduct the following:

- 1. Visual Monitoring
 - a. A designated responsible person shall be on site daily at all times during treatment operations.

- b. Daily on-site visual monitoring of the system for proper performance shall be conducted and recorded in the project data log.
 - i. The log shall include the name and phone number of the person responsible for system operation and monitoring.
 - ii. The log shall include documentation of the responsible person's training.

2. Operational and Compliance Monitoring

- a. Flow shall be continuously monitored and recorded at not greater than 15-minute intervals for total volume treated and discharged.
- b. Influent and effluent pH must be continuously monitored and recorded at not greater than 15-minute intervals.
- c. Influent and effluent turbidity (expressed in NTU) must be continuously monitored and recorded at not greater than 15-minute intervals.
- d. The type and amount of chemical used for pH adjustment, if any, shall be monitored and recorded.
- e. Dose rate of chemical used in the ATS system (expressed in mg/L) shall be monitored and reported 15-minutes after startup and every 8 hours of operation.
- f. Laboratory duplicates – monthly laboratory duplicates for residual coagulant analysis must be performed and records shall be maintained onsite.
- g. Effluent shall be monitored and recorded for residual chemical/additive levels.
- h. If a residual chemical/additive test does not exist and the ATS is operating in a batch treatment mode of operation refer to the toxicity monitoring requirements below.

3. Toxicity Monitoring

A discharger operating in batch treatment mode shall perform toxicity testing in accordance with the following:

- a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge.⁹ All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS)

⁹ This requirement only requires that the test be initiated prior to discharge.

Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.¹⁰

- b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in “Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012” for Fathead minnow, *Pimephales promelas* or Rainbow trout *Oncorhynchus mykiss* may be used as a substitute for fathead minnow.
- c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.¹¹

4. Reporting and Recordkeeping

At a minimum, every 30 days a LRP representing the discharger shall access the State Water Boards Storm Water Multi-Application and Report Tracking system (SMARTS) and electronically upload field data from the ATS. Records must be kept for three years after the project is completed .

5. Non-compliance Reporting

- a. Any indications of toxicity or other violations of water quality objectives shall be reported to the appropriate regulatory agency as required by this General Permit.
- b. Upon any measurements that exceed water quality standards, the system operator shall immediately notify his supervisor or other responsible parties, who shall notify the Regional Water Board.
- c. If any monitoring data exceeds any applicable NEL in this General Permit, the discharger shall electronically submit a NEL Violation Report to the State Water Board within 24 hours after the NEL exceedance has been identified.
 - i. ATS dischargers shall certify each NEL Violation Report in accordance with the Special Provisions for Construction Activity in this General Permit.
 - ii. ATS dischargers shall retain an electronic or paper copy of each NEL Violation Report for a minimum of three years after the date the annual report is filed.
 - iii. ATS dischargers shall include in the NEL Violation Report:

¹⁰ http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.

¹¹ <http://www.epa.gov/waterscience/methods/wet/>.

- (1) The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”);
 - (2) The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and
 - (3) A description of the current onsite BMPs, and the proposed corrective actions taken to manage the NEL exceedance.
- iv. Compliance Storm Exemption - In the event that an applicable NEL has been exceeded during a storm event equal to or larger than the Compliance Storm Event, ATS dischargers shall report the on-site rain gauge reading and nearby governmental rain gauge readings for verification.

	A	B	C
1	Sediment Risk Factor Worksheet		Entry
2	A) R Factor		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5		R Factor Value	0
6	B) K Factor (weighted average, by area, for all site soils)		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9		K Factor Value	0
10	C) LS Factor (weighted average, by area, for all slopes)		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13		LS Factor Value	0
14			
15	Watershed Erosion Estimate (=R_xK_xLS) in tons/acre		0
16	Site Sediment Risk Factor		Low
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			
21			
22			
23	GIS Map Method:		
24	1. The R factor for the project is calculated using the online calculator at:		
25	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
26			
27	2. The K and LS factors may be obtained by accessing the GIS maps located on the State Water Board FTP website at:		
28	ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/		
29			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment (For help with impaired waterbodies please visit the link below) or has a USEPA approved TMDL implementation plan for sediment ? http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	no	Low
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml		
Region 1 Basin Plan Region 2 Basin Plan Region 3 Basin Plan Region 4 Basin Plan Region 5 Basin Plan Region 6 Basin Plan Region 7 Basin Plan Region 8 Basin Plan Region 9 Basin Plan		

Combined Risk Level Matrix

		<u>Sediment Risk</u>		
		Low	Medium	High
<u>Receiving Water Risk</u>	Low	Level 1	Level 2	
	High	Level 2		Level 3

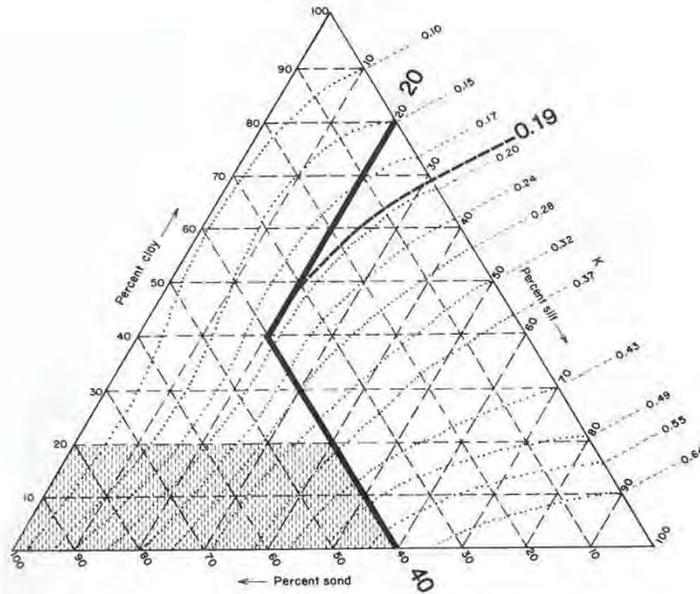
Project Sediment Risk: **Low**

Project RW Risk: **Low**

Project Combined Risk: **Level 1**

Soil Erodibility Factor (K)

The K factor can be determined by using the nomograph method, which requires that a particle size analysis (ASTM D-422) be done to determine the percentages of sand, very fine sand, silt and clay. Use the figure below to determine appropriate K value.



Erickson triangular nomograph used to estimate soil erodibility (K) factor.

The figure above is the USDA nomograph used to determine the K factor for a soil, based on its texture (% silt plus very fine sand, % sand, % organic matter, soil structure, and permeability). *Nomograph from Erickson 1977 as referenced in Goldman et. al., 1986.*

Sheet Flow Length (ft)	Average Watershed Slope (%)																		
	0.2	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0	30.0	40.0	50.0	60.0
<3	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.35	0.36	0.38	0.39	0.41	0.45	0.48	0.53	0.58	0.63
6	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.37	0.41	0.45	0.49	0.56	0.64	0.72	0.85	0.97	1.07
9	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.38	0.45	0.51	0.56	0.67	0.80	0.91	1.13	1.31	1.47
12	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.39	0.47	0.55	0.62	0.76	0.93	1.08	1.37	1.62	1.84
15	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.40	0.49	0.58	0.67	0.84	1.04	1.24	1.59	1.91	2.19
25	0.05	0.07	0.10	0.16	0.21	0.26	0.31	0.36	0.45	0.57	0.71	0.85	0.98	1.24	1.56	1.86	2.41	2.91	3.36
50	0.05	0.08	0.13	0.21	0.30	0.38	0.46	0.54	0.70	0.91	1.15	1.40	1.64	2.10	2.67	3.22	4.24	5.16	5.97
75	0.05	0.08	0.14	0.25	0.36	0.47	0.58	0.69	0.91	1.20	1.54	1.87	2.21	2.86	3.67	4.44	5.89	7.20	8.37
100	0.05	0.09	0.15	0.28	0.41	0.55	0.68	0.82	1.10	1.46	1.88	2.31	2.73	3.57	4.59	5.58	7.44	9.13	10.63
150	0.05	0.09	0.17	0.33	0.50	0.68	0.86	1.05	1.43	1.92	2.51	3.09	3.68	4.85	6.30	7.70	10.35	12.75	14.89
200	0.06	0.10	0.18	0.37	0.57	0.79	1.02	1.25	1.72	2.34	3.07	3.81	4.56	6.04	7.88	9.67	13.07	16.16	18.92
250	0.06	0.10	0.19	0.40	0.64	0.89	1.16	1.43	1.99	2.72	3.60	4.48	5.37	7.16	9.38	11.55	15.67	19.42	22.78
300	0.06	0.10	0.20	0.43	0.69	0.98	1.28	1.60	2.24	3.09	4.09	5.11	6.15	8.23	10.81	13.35	18.17	22.57	26.51
400	0.06	0.11	0.22	0.48	0.80	1.14	1.51	1.90	2.70	3.75	5.01	6.30	7.60	10.24	13.53	16.77	22.95	28.60	33.67
600	0.06	0.12	0.24	0.56	0.96	1.42	1.91	2.43	3.52	4.95	6.67	8.45	10.26	13.94	18.57	23.14	31.89	39.95	47.18
800	0.06	0.12	0.26	0.63	1.10	1.65	2.25	2.89	4.24	6.03	8.17	10.40	12.69	17.35	23.24	29.07	40.29	50.63	59.93
1000	0.06	0.13	0.27	0.69	1.23	1.86	2.55	3.30	4.91	7.02	9.57	12.23	14.96	20.57	27.66	34.71	48.29	60.84	72.15

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

APPENDIX 2: Post-Construction Water Balance Performance Standard Spreadsheet

The discharger shall submit with their Notice of Intent (NOI) the following information to demonstrate compliance with the New and Re-Development Water Balance Performance Standard.

Map Instructions

The discharger must submit a small-scale topographic map of the site to show the existing contour elevations, pre- and post-construction drainage divides, and the total length of stream in each watershed area. Recommended scales include 1 in. = 20 ft., 1 in. = 30 ft., 1 in. = 40 ft., or 1 in. = 50 ft. The suggested contour interval is usually 1 to 5 feet, depending upon the slope of the terrain. The contour interval may be increased on steep slopes. Other contour intervals and scales may be appropriate given the magnitude of land disturbance.

Spreadsheet Instructions

The intent of the spreadsheet is to help dischargers calculate the project-related increase in runoff volume and select impervious area and runoff reduction credits to reduce the project-related increase in runoff volume to pre-project levels.

The discharger has the option of using the spreadsheet (**Appendix 2.1**) or a more sophisticated, watershed process-based model (e.g. Storm Water Management Model, Hydrological Simulation Program Fortran) to determine the project-related increase in runoff volume.

In Appendix 4.1, you must complete the worksheet for each land use/soil type combination for each project sub-watershed.

Steps 1 through 9 pertain specifically to the Runoff Volume Calculator:

Step 1: Enter the county where the project is located in cell H3.

Step 2: Enter the soil type in cell H6.

Step 3: Enter the existing pervious (dominant) land use type in cell H7.

Step 4: Enter the proposed pervious (dominant) land use type in cell H8.

Step 5: Enter the total project site area in cell H11 or J11.

Step 6: Enter the sub-watershed area in cell H12 or J12.

- Step 7: Enter the existing rooftop area in cell H17 or J17, the existing non-rooftop impervious area in cell H18 or J18, the proposed rooftop area in cell H19 or J19, and the proposed non-rooftop impervious area in cell H20 or J20
- Step 8: Work through each of the impervious area reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.
- Step 9: Work through each of the impervious volume reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Non-structural Practices Available for Crediting

- ***Porous Pavement***
- ***Tree Planting***
- ***Downspout Disconnection***
- ***Impervious Area Disconnection***
- ***Green Roof***
- ***Stream Buffer***
- ***Vegetated Swales***
- ***Rain Barrels and Cisterns***
- ***Landscaping Soil Quality***

Porous Pavement Credit Worksheet

Please fill out a porous pavement credit worksheet for each project sub-watershed.

For the PROPOSED Development:

Proposed Porous Pavement	Runoff Reduction*	Fill in either Acres or SqFt		Equivalent Acres
		In SqFt.	In Acres	
Area of Brick without Grout on <u>less than 12 inches</u> of base with at least 20% void space over soil	0.45			0.00
Area of Brick without Grout on <u>more than 12 inches</u> of base with at least 20% void space over soil	0.90			0.00
Area of Cobbles <u>less than 12 inches</u> deep and over soil	0.30			0.00
Area of Cobbles <u>less than 12 inches</u> deep and over soil	0.60			0.00
Area of Reinforced Grass Pavement on <u>less than 12 inches</u> of base with at least 20% void space over soil	0.45			0.00
Area of Reinforced Grass Pavement on <u>at least 12 inches</u> of base with at least 20% void space over soil	0.90			0.00
Area of Porous Gravel Pavement on <u>less than 12 inches</u> of base with at least 20% void space over soil	0.38			0.00
Area of Porous Gravel Pavement on <u>at least 12 inches</u> of base with at least 20% void space over soil	0.75			0.00
Area of Poured Porous Concrete or Asphalt Pavement with <u>less than 4 inches</u> of gravel base (washed stone)	0.40			0.00
Area of Poured Porous Concrete or Asphalt Pavement with <u>4 to 8 inches</u> of gravel base (washed stone)	0.60			0.00
Area of Poured Porous Concrete or Asphalt Pavement with <u>8 to 12 inches</u> of gravel base (washed stone)	0.80			0.00
Area of Poured Porous Concrete or Asphalt Pavement with <u>12 or more</u> inches of gravel base (washed stone)	1.00			0.00

*=1-Rv**

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**Using Site Design Techniques to meet Development Standards for Stormwater Quality (BASMAA 2003)

**NCDENR Stormwater BMP Manual (2007)

Tree Planting Credit Worksheet

Please fill out a tree canopy credit worksheet for each project sub-watershed.

Tree Canopy Credit Criteria	Number of Trees Planted	Credit (acres)
Number of proposed evergreen trees to be planted (credit = number of trees x 0.005)*	0	0.00
Number of proposed deciduous trees to be planted (credit = number of trees x 0.0025)*		0.00
	Square feet Under Canopy	
Square feet under an existing tree canopy, that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is LESS than 12 in diameter.		0.00
Square feet under an existing tree canopy that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is 12 in diameter or GREATER.		0.00
Please describe below how the project will ensure that these trees will be maintained.		

0

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* credit amount based on credits from Stormwater Quality Design Manual for the Sacramento and South Placer Regions

Downspout Disconnection Credit Worksheet

Please fill out a downspout disconnection credit worksheet for each project subwatershed. If you answer yes to all questions, all rooftop area draining to each downspout will be subtracted from your proposed rooftop impervious coverage.

Downspout Disconnection Credit Criteria					
Do downspouts and any extensions extend at least six feet from a basement and two feet from a crawl space or concrete slab?				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Is the area of rooftop connecting to each disconnected downspout 600 square feet or less?				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Is the roof runoff from the design storm event fully contained in a raised bed or planter box or does it drain as sheet flow to a landscaped area large enough to contain the roof runoff from the design storm event?				<input type="radio"/> Yes	<input checked="" type="radio"/> No
The Stream Buffer and/or Vegetated Swale credits will not be taken in this sub-watershed area?				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Percentage of existing	0.00	Acres	of rooftop surface has disconnected downspouts		
Percentage of the proposed	0.00	Acres	of rooftop surface has disconnected downspouts			50
				Return to Calculator	

Impervious Area Disconnection Credit Worksheet

Please fill out an impervious area disconnection credit worksheet for each project sub-watershed. If you answer yes to all questions, all non-rooftop impervious surface area will be subtracted from your proposed non-rooftop impervious coverage.

Non-Rooftop Disconnection Credit Criteria	Response
Is the maximum contributing impervious flow path length less than 75 feet or, if equal or greater than 75 feet, is a storage device (e.g. French drain, bioretention area, gravel trench) implemented to achieve the required disconnection length?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Is the impervious area to any one discharge location less than 5,000 square feet?	<input checked="" type="radio"/> Yes <input type="radio"/> No
The Stream Buffer credit will not be taken in this sub-watershed area?	<input checked="" type="radio"/> Yes <input type="radio"/> No

Percentage of existing	0.00	Acres non-rooftop surface area disconnected	
Percentage of the proposed	0.00	Acres non-rooftop surface area disconnected	70

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Green Roof Credit Worksheet

Please fill out a greenroof credit worksheet for each project sub-watershed. If you answer yes to all questions, 70% of the greenroof area will be subtracted from your proposed rooftop impervious coverage.

Green Roof Credit Criteria		Response
Is the roof slope less than 15% or does it have a grid to hold the substrate in place until it forms a thick vegetation mat?		<input checked="" type="radio"/> Yes <input type="radio"/> No
Has a professional engineer assessed the necessary load reserves and designed a roof structure to meet state and local codes?		<input checked="" type="radio"/> Yes <input type="radio"/> No
Is the irrigation needed for plant establishment and/or to sustain the green roof during extended dry periods, is the source from stored, recycled, reclaimed, or reused water?		<input checked="" type="radio"/> Yes <input type="radio"/> No
Percentage of existing	0.0 0 Acres rooftop surface area in greenroof	
Percentage of the proposed	0.0 0 Acres rooftop surface area in greenroof	
		Return to Calculator

Stream Buffer Credit Worksheet

Please fill out a stream buffer credit worksheet for each project sub-watershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout and/or Impervious Area Disconnection credits.

Stream Buffer Credit Criteria				Response
Does runoff enter the floodprone width* or within 500 feet (whichever is larger) of a stream channel as sheet flow**?				<input type="radio"/> Yes <input checked="" type="radio"/> No
Is the contributing overland slope 5% or less, or if greater than 5%, is a level spreader used?				<input type="radio"/> Yes <input checked="" type="radio"/> No
Is the buffer area protected from vehicle or other traffic barriers to reduce compaction?				<input type="radio"/> Yes <input checked="" type="radio"/> No
Will the stream buffer be maintained in an ungraded and uncompacted condition and will the vegetation be maintained in a natural condition?				<input type="radio"/> Yes <input checked="" type="radio"/> No
Percentage of existing	0.00	Acres	impervious surface area draining into a stream buffer:	
Percentage of the proposed	0.00	Acres	impervious surface area that will drain into a stream buffer:	
Please describe below how the project will ensure that the buffer areas will remain in ungraded and uncompacted condition and that the vegetation will be maintained in a natural condition.				

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* floodprone width is the width at twice the bankfull depth.

** the maximum contributing length shall be 75 feet for impervious area

Vegetated Swale Credit Worksheet

Please fill out a vegetated swale worksheet for each project subwatershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout Disconnection credit.

Vegetated Swale Credit Criteria

Have all vegetated swales been designed in accordance with Treatment Control BMP 30 (TC-30 - Vegetated Swale) from the California Stormwater BMP Handbook, New Development and Redevelopment (available at www.cabmphandbooks.com)?

<input type="radio"/> Yes	<input checked="" type="radio"/> No
---------------------------	-------------------------------------

Is the maximum flow velocity for runoff from the design storm event less than or equal to 1.0 foot per second?

<input type="radio"/> Yes	<input checked="" type="radio"/> No
---------------------------	-------------------------------------

Percentage of existing	0.00	Acres of impervious area draining to a vegetated swale	
Percentage of the proposed	0.00	Acres of impervious area draining to a vegetated swale	

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Rain Barrel/Cistern Credit Worksheet

Please fill out a rain barrel/cistern worksheet for each project sub-watershed.

Rain Barrel/Cistern Credit Criteria	Response
Total number of rain barrel(s)/cisterns	
Average capacity of rain barrel(s)/cistern(s) (in gallons)	
Total capacity rain barrel(s)/cistern(s) (in cu ft) ¹	0

¹ accounts for 10% loss

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Please fill out a soil quality worksheet for each project sub-watershed.

	Response
Will the landscaped area be lined with an impervious membrane?	
Will the soils used for landscaping meet the ideal bulk densities listed in Table 1 below? ¹	<input type="radio"/> Yes <input checked="" type="radio"/> No
If you answered yes to the question above, and you know the area-weighted bulk density within the top 12 inches for soils used for landscaping (in g/cm ³)*, fill in the cell to the right and skip to cell G11. If not select from the drop-down menu in G10.	1.3
If you answered yes to the question above, but you do not know the exact bulk density, which of the soil types in the drop down menu to the right best describes the top 12 inches for soils used for landscaping (in g/cm ³).	Sandy loams, loams
What is the average depth of your landscaped soil media meeting the above criteria (inches)?	12
What is the total area of the landscaped areas meeting the above criteria (in acres)?	2.97

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Table 1

Sands, loamy sands	<1.6
Sandy loams, loams	<1.4
Sandy clay loams, loams, clay loams	<1.4
Silts, silt loams	<1.3
Silt loams, silty clay loams	<1.1
Sandy clays, silty clays, some clay loams (35-45% clay)	<1.1
Clays (>45% clay)	<1.1

Porosity (%) 50.94%

Mineral grains in many soils are mainly quartz and feldspar, so 2.65 a good average for particle density. To determine percent porosity, use the formula: Porosity (%) = (1-Bulk Density/2.65) X 100

¹ USDA NRCS. "Soil Quality Urban Technical Note No.2-Urban Soil Compaction". March 2000.

http://soils.usda.gov/sqi/management/files/sq_utn_2.pdf

* To determine how to calculate density see:

<http://www.globe.gov/tctg/bulkden.pdf?sectionID=94>

APPENDIX 3 Bioassessment Monitoring Guidelines

Bioassessment monitoring is required for projects that meet all of the following criteria:

1. The project is rated Risk Level 3 or LUP Type 3
2. The project directly discharges runoff to a freshwater wadeable stream (or streams) that is either: (a) listed by the State Water Board or USEPA as impaired due to sediment, and/or (b) tributary to any downstream water body that is listed for sediment; and/or have the beneficial use SPAWN & COLD & MIGRATORY
3. Total project-related ground disturbance exceeds 30 acres.

For all such projects, the discharger shall conduct bioassessment monitoring, as described in this section, to assess the effect of the project on the biological integrity of receiving waters.

Bioassessment shall include:

1. The collection and reporting of specified instream biological data
2. The collection and reporting of specified instream physical habitat data

Bioassessment Exception

If a site qualifies for bioassessment, but construction commences out of an index period for the site location, the discharger shall:

1. Receive Regional Water Board approval for the sampling exception
2. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.
3. Send a copy of the check to the Regional Water Board office for the site's region
4. Invest **7,500.00 X The number of samples required** into the SWAMP program as compensation (upon Regional Water Board approval).
5. Conduct bioassessment monitoring, as described in Appendix 4
6. Include the collection and reporting of specified instream biological data and physical habitat
7. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP)

Site Locations and Frequency

Macroinvertebrate samples shall be collected both before ground disturbance is initiated and after the project is completed. The "after" sample(s) shall be collected after at least one winter season resulting in surface runoff has transpired after project-related ground disturbance has ceased. "Before" and "after" samples shall be collected both upstream and downstream of the project's

discharge. Upstream samples should be taken immediately before the sites outfall and downstream samples should be taken immediately after the outfall (when safe to collect the samples). Samples should be collected for each freshwater wadeable stream that is listed as impaired due to sediment, or tributary to a water body that is listed for sediment. Habitat assessment data shall be collected concurrently with all required macroinvertebrate samples.

Index Period (Timing of Sample Collection)

Macroinvertebrate sampling shall be conducted during the time of year (i.e., the “index period”) most appropriate for bioassessment sampling, depending on ecoregion. This map is posted on the State Water Board’s Website: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml

Field Methods for Macroinvertebrate Collections

In collecting macroinvertebrate samples, the discharger shall use the “Reachwide Benthos (Multi-habitat) Procedure” specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007).¹

Physical - Habitat Assessment Methods

The discharger shall conduct, concurrently with all required macroinvertebrate collections, the “Full” suite of physical habitat characterization measurements as specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007), and as summarized in the Surface Water Ambient Monitoring Program’s *Stream Habitat Characterization Form — Full Version*.

Laboratory Methods

Macroinvertebrates shall be identified and classified according to the Standard Taxonomic Effort (STE) Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT),² and using a fixed-count of 600 organisms per sample.

Quality Assurance

The discharger or its consultant(s) shall have and follow a quality assurance (QA) plan that covers the required bioassessment monitoring. The QA plan shall include, or be supplemented to include, a specific requirement for external QA checks (i.e., verification of taxonomic identifications and correction of data where

¹ This document is available on the Internet at: http://www.swrcb.ca.gov/swamp/docs/phab_sopr6.pdf.
http://swamp.mpsl.mml.calstate.edu/wp-content/uploads/2009/04/swamp_sop_bioassessment_collection_020107.pdf.

² The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf
http://www.safit.org/Docs/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board’s SWAMP website.

errors are identified). External QA checks shall be performed on one of the discharger's macroinvertebrate samples collected per calendar year, or ten percent of the samples per year (whichever is greater). QA samples shall be randomly selected. The external QA checks shall be paid for by the discharger, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used if approved in writing by State Water Board staff.

Sample Preservation and Archiving

The original sample material shall be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material shall be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms shall be stored in 70 percent ethanol, in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms shall be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, method of collection). The identified organisms shall be archived (i.e., retained) by the discharger for a period of not less than three years from the date that all QA steps are completed, and shall be checked at least once per year and "topped off" with ethanol to prevent desiccation. The identified organisms shall be relinquished to the State Water Board upon request by any State Water Board staff.

Data Submittal

The macroinvertebrate results (i.e., taxonomic identifications consistent with the specified SAFIT STEs, and number of organisms within each taxa) shall be submitted to the State Water Board in electronic format. The State Water Board's Surface Water Ambient Monitoring Program (SWAMP) is currently developing standardized formats for reporting bioassessment data. All bioassessment data collected after those formats become available shall be submitted using the SWAMP formats. Until those formats are available, the biological data shall be submitted in MS-Excel (or equivalent) format.³

The physical/habitat data shall be reported using the standard format titled *SWAMP Stream Habitat Characterization Form — Full Version*.⁴

³ Any version of Excel, 2000 or later, may be used.

⁴ Available at:

http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Invasive Species Prevention

In conducting the required bioassessment monitoring, the discharger and its consultants shall take precautions to prevent the introduction or spread of aquatic invasive species. At minimum, the discharger and its consultants shall follow the recommendations of the California Department of Fish and Game to minimize the introduction or spread of the New Zealand mudsnail.⁵

⁵ Instructions for controlling the spread of NZ mudsnails, including decontamination methods, can be found at: <http://www.dfg.ca.gov/invasives/mudsnail/>
More information on AIS More information on AIS
http://www.waterboards.ca.gov/water_issues/programs/swamp/ais/

Appendix 4 Non Sediment TMDLs

Region 1 Lost River-DIN and CBOD

Region 1 Source: Cal Trans Construction TMDL Completion Date: 12 30 2008 TMDL Type: River, Lake Watershed Area= 2996 mi ²	Pollutant Stressors/WLA	
	Dissolved inorganic nitrogen (DIN) (metric tons/yr)	Carbonaceous biochemical oxygen demand (CBOD) (metric tons/yr)
Lost River from the Oregon border to Tule Lake	.1	.2
Tule Lake Refuge	.1	.2
Lower Klamath Refuge	.1	.2

Region 2 San Francisco Bay-Mercury

Region 2 Source: Non-Urban Stormwater Runoff TMDL Type: Bay	Name	Pollutant Stressor/WLA	TMDL Completion Date
	San Francisco Bay	Mercury 25 kg/year	08 09 2006

Region 4 Ballona Creek-Metals and Selenium

Region 4 Source: NPDES General Construction TMDL Completion Date: 12 22 2005 TMDL Type: Creek	Pollutant Stressors/WLA							
	Copper (Cu)		Lead (Pb)		Selenium (Se)		Zinc (Zn)	
	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre
Ballona Creek	4.94E-07 x Daily storm volume (L)	2.20E-10 x Daily storm volume (L)	1.62E-06 x Daily storm volume (L)	7.20E-10 x Daily storm volume (L)	1.37E-07 x Daily storm volume (L)	6.10E-11 x Daily storm volume (L)	3.27E-06 x Daily storm volume (L)	1.45E-09 x Daily storm volume (L)

General Construction Storm Water Permits:

Waste load allocations will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

- Dry-weather Implementation Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order No. 99-08 DWQ), or any successor order, are exempt from the dry-weather waste load allocation equal to zero as long as they comply with the provisions of sections C.3 and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be:
 - (1) infeasible to eliminate
 - (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and
 - (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order.
 Unauthorized non-storm water flows are already prohibited by Order No. 99-08 DWQ.
- Wet-weather Implementation Within seven years of the effective date of the TMDL, the construction industry will submit the results of BMP effectiveness studies to determine BMPs that will achieve compliance with the final waste load allocations assigned to construction storm water permittees.
- Regional Board staff will bring the recommended BMPs before the Regional Board for consideration within eight years of the effective date of the TMDL.
- General construction storm water permittees will be considered in compliance with final waste load allocations if they implement these Regional Board approved BMPs. All permittees must implement the approved BMPs within nine years of the effective date of the TMDL. If no effectiveness studies are conducted and no BMPs are approved by the Regional Board within eight years of the effective date of the TMDL, each general construction storm water permit holder will be subject to site-specific BMPs and monitoring requirements to demonstrate compliance with final waste load allocations.

Region 4 Calleaguas Creek-OC Pesticides, PCBs, and Siltation

Interim Requirements

Region 4 Calleaguas Creek	Pollutant Stressor	WLA Daily Max (µg/L)	WLA Monthly Ave (µg/L)
Source: Minor NPDES point sources/WDRs	Chlordane	1.2	0.59
TMDL Completion Date: 3 14 2006	4,4-DDD	1.7	0.84
TMDL Type:Creek	4,4-DDE	1.2	0.59
	4,4-DDT	1.2	0.59
	Dieldrin	0.28	0.14
	PCB's	0.34	0.17
	Toxaphene	0.33	0.16

Final WLA (ng/g)							
Region 4 Calleguas Creek Source: Stormwater Permittees TMDL Completion Date: 3 14 2006 TMDL Type:Creek	Chlordane	4,4-DDD	4,4-DDE	4,4-DDT	Dieldrin	PCB's	Toxaphene
Mugu Lagoon*	3.3	2.0	2.2	0.3	4.3	180.0	360.0
Callegaus Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Revolon Slough (SW)*	0.9	2.0	1.4	0.3	0.1	130.0	1.0
Arroyo Las posas(SW)*	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Arroyo Simi	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Conejo Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Interim Requirements (ng/g)							
Mugu Lagoon*	25.0	69.0	300.0	39.0	19.0	180.	22900.0
Callegaus Creek	17.0	66.0	470.0	110.0	3.0	3800.0	260.0
Revolon Slough (SW)*	48.0	400.0	1600.0	690.0	5.7	7600.0	790.0
Arroyo Las posas(SW)*	3.3	290.0	950.0	670.0	1.1	25700.0	230.0
Arroyo Simi	3.3	14.0	170.0	25.0	1.1	25700.0	230.0
Conejo Creek	3.4	5.3	20.0	2.0	3.0	3800.0	260.0

*(SW)=Subwatershed

*Mugu Lagoon includes Duck pond/Agricultural Drain/Mugu/Oxnard Drain #2

Compliance with sediment based WLAs is measured as an instream annual average at the base of each subwatershed where the discharges are located.

Region 4 Calleguas Creek-Salts

Final Dry Weather Pollutant WLA (mg/L)					
Region 4 Calleguas Creek Source Permitted Stormwater Dischargers TMDL Completion Date: 12 2 2008 TMDL Type:Creek	Critical Condition Flow Rate (mgd)	Chloride (lb/day)	TDS (lb/day)	Sulfate (lb/day)	Boron (lb/day)
Simi	1.39	1738.0	9849.0	2897.0	12.0
Las Posas	0.13	157.0	887.0	261.0	N/A
Conejo	1.26	1576.0	8931.0	2627.0	N/A

Camarillo	0.06	72.0	406.0	119.0	N/A
Pleasant Valley (Calleguas)	0.12	150.0	850.0	250.0	N/A
Pleasant Valley (Revolon)	0.25	314.0	1778.0	523.0	2.0
Dry Weather Interim Pollutant WLA (mg/L)					
	Chloride (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Boron (mg/L)	
Simi	230.0	1720.0	1289.0	1.3	
Las Posas	230.0	1720.0	1289.0	1.3	
Conejo	230.0	1720.0	1289.0	1.3	
Camarillo	230.0	1720.0	1289.0	1.3	
Pleasant Valley (Calleguas)	230.0	1720.0	1289.0	1.3	
Pleasant Valley (Revolon)	230.0	1720.0	1289.0	1.3	

- General Construction permittees are assigned a dry weather wasteload allocation equal to the average dry weather critical condition flow rate multiplied by the numeric target for each constituent. Waste load allocations apply in the receiving water at the base of each subwatershed. Dry weather allocations apply when instream flow rates are below the 86th percentile flow and there has been no measurable precipitation in the previous 24 hours.
- Because wet weather flows transport a large mass of salts at low concentrations, these dischargers meet water quality objectives during wet weather.
- Interim limits are assigned for dry weather discharges from areas covered by NPDES stormwater permits to allow time to implement appropriate actions. The interim limits are assigned as concentration based receiving water limits set to the 95th percentile of the discharger data as a monthly average limit except for chloride. The 95th percentile for chloride was 267 mg/L which is higher than the recommended criteria set forth in the Basin Plan for protection of sensitive beneficial uses including aquatic life. Therefore, the interim limit for chloride for Permitted Stormwater Dischargers is set equal to 230 mg/L to ensure protection of sensitive beneficial uses in the Calleguas Creek watershed.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Region 4 San Gabriel River and Tributaries Source: Construction Stormwater Dischargers TMDL Completion Date: 3 2007 TMDL Type: Creek	Pollutant Stressor	Wet weather Allocations	Dry Weather Allocations	% of Watershed
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San Gabriel Reach 2	Lead (Pb)	0.7% * 166 µg/l * Daily Storm Vol	N/A	0.7%
San Gabriel Reach 2	Lead (Pb) Mass based	0.8 kg/d	N/A	0.7%
Coyote Creek	Copper (Cu)	0.285 kg/d	0	5.0%
Coyote Creek	Lead (Pb)	1.70 kg/d	N/A	5.0%
Coyote Creek	Zinc (Zn)	2.4 kg/d	N/A	5.0%
San Jose Creek Reach 1 and 2	Selenium	5 µg/L	5 µg/L	5.0%

Wet-weather allocations for lead in San Gabriel River Reach 2. Concentration-based allocations apply to non-stormwater NPDES discharges. Stormwater allocations are expressed as a percent of load duration curve. Mass-based values presented in table are based on a flow of 260 cfs (daily storm volume = 6.4×10^8 liters).

There are 1555 acres of water in the entire watershed, 37.4 acres of water in the Reach 1 subwatershed (2.4%), and 269 acres in the Coyote Creek subwatershed (17%).

General Construction Storm Water Permits

Waste load allocations for the general construction storm water permits may be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board. An estimate of direct atmospheric deposition is developed based on the percent area of surface water in the watershed. Approximately 0.4% of the watershed area draining to San Gabriel River Reach 2 is comprised of water and approximately 0.2% of the watershed area draining to Coyote Creek is comprised of water.

Region 4 The Harbor Beaches of Ventura County-Bacteria

The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. Bacteriological objectives are set forth in Chapter 3 of the Basin Plan. The objectives are based on four bacteria indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:

The General NPDES Construction permit is seen as a minor contributor and is given no allocation

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR permittees in the Channel Islands Harbor subwatershed are assigned WLAs of zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, individual NPDES permit, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR will also be subject to a WLA of zero (0) days of allowable exceedances.

Region 4 Resolution No. 03-009 Los Angeles River and Tributaries-Nutrients

Minor Point Sources

Waste loads are allocated to minor point sources enrolled under NPDES or WDR permits including but not limited to Tapia WRP, Whittier Narrows WRP, Los Angeles Zoo WRP, industrial and construction stormwater, and municipal storm water and urban runoff from municipal separate storm sewer systems (MS4s)

Region 4 Minor Point Sources for NPDES/WDR Permits TMDL Completion Date: 7 10 2003 TMDL Type: River	Pollutant Stressor/WLA				
	Total Ammonia (NH ₃)		Nitrate-nitrogen (NO ₃ -N)	Nitrite-nitrogen (NO ₂ -N)	NO ₃ -N + NO ₃ -N
	1 Hr Ave mg/l	30 Day Ave mg/l	30 Day Ave mg/l		30 Day Ave mg/l
LA River Above Los Angeles-Glendale WRP (LAG)	4.7	1.6	8.0	1.0	8.0
LA River Below LAG	8.7	2.4	8.0	1.0	8.0
Los Angeles Tributaries	10.1	2.3	8.0	1.0	8.0

Malibu Creek Attachment A to Resolution No. 2004-019R-Bacteria

12 13 2004 The WLAs for permittees under the NPDES General Stormwater Construction Permit are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean.

Region 4 Marina del Rey Harbor, Mothers' Beach and Back Basins

Attachment A to Resolution No. 2003-012-Bacteria

8 7 2003 As discussed in "Source Analysis", discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the MdR Watershed will also be subject to a WLA of zero days of allowable exceedances.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Dry Weather Selenium WLA

A zero WLA is assigned to the industrial and construction stormwater permits during dry weather. Non-storm water discharges are already prohibited or restricted by existing general permits.

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	Total Recoverable Metals (kg/day)		
	Copper (Cu) Kg/day	Lead (Pb) Kg/day	Zinc (Zn) Kg/day
San Gabriel River Reach 2 and upstream reaches/tributaries	XXXX	Daily storm volume x 1.24 µg/L	XXXX
Coyote Creek and Tributaries	Daily storm volume x 0.7 µg/L	Daily storm volume x 4.3 µg/L	Daily storm volume x 6.2 µg/L

Each enrollee under the general construction stormwater permit receives a WLA on a per acre basis

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	Total Recoverable Metals (kg/day/acre)		
	Copper (Cu) Kg/acre/day	Lead (Pb) Kg/acre/day	Zinc (Zn) Kg/acre/day
San Gabriel River Reach 2 and upstream reaches/tributaries	XXXX	Daily storm volume x 0.56 µg/L	XXXX

Coyote Creek and Tributaries	Daily storm volume x 0.12 µg/L	Daily storm volume x 0.70 µg/L	Daily storm volume x 1.01 µg/L
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For the general industrial and construction storm water permits, the daily storm volume is measured at USGS station 11085000 for discharges to Reach 2 and above and at LACDPW flow gauge station F354-R for discharges to Coyote Creek.

General construction storm water permits

WLAs will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

Dry-weather implementation

Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (NPDES Permit No. CAS000002), or any successor permit, are exempt from the dry-weather WLA equal to zero as long as they comply with the provisions of sections C.3. and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be (1) infeasible to eliminate (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order. Unauthorized non-storm water flows are already prohibited by Permit No. CAS000002.

Upon permit issuance, renewal, or re-opener

Non-storm water flows not authorized by Order No. 99-08 DWQ, or any successor order, shall achieve dry-weather WLAs. WLAs shall be expressed as NPDES water quality-based effluent limitations specified in accordance with federal regulations and state policy on water quality control. Effluent limitations may be expressed as permit conditions, such as the installation, maintenance, and monitoring of Regional Board-approved BMPs.

Six years from the effective date of the TMDL

The construction industry will submit the results of wet-weather BMP effectiveness studies to the Los Angeles Regional Board for consideration. In the event that no effectiveness studies are conducted and no BMPs are approved, permittees shall be subject to site-specific BMPs and monitoring to demonstrate BMP effectiveness.

Seven years from the effective date of the TMDL

The Los Angeles Regional Board will consider results of the wet weather BMP effectiveness studies and consider approval of BMPs.

Eight years from the effective date of the TMDL

All general construction storm water permittees shall implement Regional Board-approved BMPs.

Region 8 RESOLUTION NO. R8-2007- 0024

Total Maximum Daily Loads (TMDLs) for San Diego Creek, Upper and Lower Newport Bay, Orange County, California

Region 8 NPDES Construction Permit TMDL Completion Date: 1 24 1995 TMDL Type: River, Cr, Bay	Organochlorine Compounds							
	Total DDT		Chlordane		Total PCBs		Toxaphene	
	g/day	g/yr	g/day	g/yr	g/day	g/yr	g/day	g/yr
San Diego Creek	.27	99.8	.18*	64.3*	.09*	31.5*	.004	1.5
Upper Newport Bay	.11	40.3	.06	23.4	.06	23.2	X	X
Lower Newport Bay	.04	14.9	.02	8.6	.17	60.7	X	X

*Red= Informational WLA only, not for enforcement purposes

Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board’s expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by *(the date of OAL approval of this BPA)*. **No later than two months** from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but **no later than (three months of completion of the SWPPP Improvement Program)**. Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board’s SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

Appendix 4 Sediment TMDLs

Implemented Sediment TMDLs in California. Construction was listed as a source in all fo these TMDLs in relation to road construction. Although construction was mentioned as a source, it was not given a specific allocation amount. The closest allocation amount would be for the road activity management WLA. **Implementation Phase** – Adoption process by the Regional Board, the State Water Resources Control Board, the Office of Administrative Law, and the US Environmental Protection Agency completed and TMDL being implemented.

A. Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi ² yr
1 R1.epa.albionfinaltmdl	R	Albion River	Sedimentation	Road Construction	2001	43 acres	See A (table 6)

B Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi ² yr
1 R1.epa.EelR-middle.mainSed.temp	R	Middle Main Eel River and Tributaries (from Dos Rios to the South Fork)	Sedimentation	Road Construction	2005-2006	521 mi ²	100

C Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi ² yr
1 R1.epa.EelRsouth.sed.temp	R	South Fork Eel River	Sedimentation	Road Construction	12 1999	See chart	473

D Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi ² yr
1 R1.epa.bigfinaltmdl	R	Big River	Sedimentation	Road Construction	12 2001	181 mi ² watershed drainage	TMDL = loading capacity = nonpoint sources + background =

							393 t mi ² yr
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E Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi² yr
1 R1.epa.EelR-lower.Sed.temp-121807-signed	R	Lower Eel River	Sedimentation	Road Construction	12 2007	300 square-mile watershed	898

F Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi² yr
1 R1.epa.EelR-middle.Sed.temp-	R	Middle Fork Eel River	Sedimentation	Road Construction	12 2003	753 mi ² (approx. 482,000 acres)	82

G Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres Mi²	WLA tons mi² yr
1 R1.epa.EelRnorth-Sed.temp.final-121807-signed	R	North Fork Eel River	Sedimentation	Road Construction	12 30 2002	289 (180,020 acres)	20

H Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres Mi²	WLA tons mi² yr
1 R1.epa.EelR-upper.mainSed.temp-	R	Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury)	Sedimentation	Road Construction	12 29 2004	688 (approx. 440,384 acres)	14

I Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi ² yr
1 R1.epa.gualalafina ltmdl	R	Gualala River	Sedimentation	Road Construction	Not sure	300 (191,145 acres)	7

J Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr
1 R1.epa.Mad- sed.turbidity	R	Mad River	Sedimentation	Road Construction	12 21 2007	480	174

K Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr
1 R1.epa.mattole.se diment	R	Mattole River	Sedimentation	Road Construction	12 30 2003	296	27 or 520+27 = 547

L Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr
1 R1.epa.navarro.se d.temp	R	Navarro River	Sedimentation	Road Construction	Not sure	315 (201,600 acres).	50

M Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr
1 R1.epa.noyo.sedi ment	R	Noyo River	Sedimentation	Road Construction	12 16 1999	113 (72,323 acres)	68 (three areas measured) Table 16 in the TMDL

N Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi²	WLA tons mi² yr
1 R1.epa.RedwoodCk.sed	Cr	Redwood Creek	Sedimentation	Road Construction	12 30 1998	278	1900 Total allocation

O Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi²	WLA – Roads tons mi² yr
1 R1.epa.tenmile.sed	R	Ten Mile River	Sedimentation	Road Construction	2000	120	9

P Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi²	WLA management tons mi² yr
1 R1.epa.trinity.sed	R	Trinity River	Sedimentation	Road Construction	12 20 2001	2000 of 3000 covered in this TMDL	See rows below
1	Cr	Horse Linto Creek	Sedimentation	Road Construction	12 20 2001	64	528
1	Cr	Mill creek and Tish Tang	Sedimentation	Road Construction	12 20 2001	39	210
1	Cr	Willow Creek	Sedimentation	Road Construction	12 20 2001	43	94
1	Cr	Campbell Creek and Supply Creek	Sedimentation	Road Construction	12 20 2001	11	1961
1	Cr	Lower Mainstem and Coon Creek	Sedimentation	Road Construction	12 20 2001	32	63
1	R	Reference	Sedimentation	Road	12 20 2001	434	24

APPENDIX 4

		Subwatershed ¹		Construction			
1	Cr	Canyon Creek	Sedimentation	Road Construction	12 20 2001	64	326
1	R	Upper Tributaries ²	Sedimentation	Road Construction	12 20 2001	72	67
1	R	Middle Tributaries ³	Sedimentation	Road Construction	12 20 2001	54	53
1	R	Lower Tributaries ⁴	Sedimentation	Road Construction	12 20 2001	96	55
1	Cr	Weaver and Rush Creeks	Sedimentation	Road Construction	12 20 2001	72	169
1	Cr	Deadwood Creek Hoadley Gulch Poker Bar	Sedimentation	Road Construction	12 20 2001	47	68
1	L	Lewiston Lake	Sedimentation	Road Construction	12 20 2001	25	49
1	Cr	Grassvalley Creek	Sedimentation	Road Construction	12 20 2001	37	44
1	Cr	Indian Creek	Sedimentation	Road Construction	12 20 2001	34	81
1	Cr	Reading and Browns Creek	Sedimentation	Road Construction	12 20 2001	104	66
1	Cr	Reference Subwatersheds ⁵	Sedimentation	Road Construction	12 20 2001	235	281
1	L, Cr	Westside tributaries ⁶	Sedimentation	Road Construction	12 20 2001	93	105
1	R, Cr, G	Upper trinity ⁷	Sedimentation	Road Construction	12 20 2001	161	690
1	R, Cr, G	East Fork Tributaries ⁸	Sedimentation	Road Construction	12 20 2001	115	65

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1	R, L	Eastside Tributaries ⁹	Sedimentation	Road Construction	12 20 2001	89	60
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- 1 New River, Big French, Manzanita, North Fork, East Fork, North Fork
- 2 Dutch, Soldier, Oregon gulch, Conner Creek
- 3 Big Bar, Prairie Creek, Little French Creek
- 4 Swede, Italian, Canadian, Cedar Flat, Mill, McDonald, Hennessy, Quimby, Hawkins, Sharber
- 5 Stuarts Fork, Swift Creek, Coffee Creek
- 6 Stuart Arm, Stoney Creek, Mule Creek, East Fork, Stuart Fork, West Side Trinity Lake, Hatchet Creek, Buckeye Creek,
- 7 Upper Trinity River, Tangle Blue, Sunflower, Graves, Bear Upper Trinity Mainstream, Ramshorn Creek, Ripple Creek, Minnehaha Creek, Snowslide Gulch, Scorpion Creek
- 8 East Fork Trinity, Cedar Creek, Squirrel Gulch
- 9 East Side Tributaries, Trinity Lake

Q Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr
1 R1.epa.trinity.so.sed	R, Cr	South Fork Trinity River and Hayfork Creek	Sedimentation	Road Construction	12 1998	Not given, 19 miles long	33 (road total)

R Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr
1 R1.epa.vanduzen.sed	R, Cr	Van Duzen River and Yager Creek	Sedimentation	Various	12 16 1999	429	1353 total allocation
1		Upper Basin	Sedimentation	Road Construction			7
1		Middle Basin	Sedimentation	Road Construction			22
1		Lower Basin	Sedimentation	Road Construction			20

S Region	Type	Name	Pollutant Stressor	Potential	TMDL	Watershed	WLA tons mi ²
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				Sources	Completion Date	Acres mi ²	yr	
6	R6.blackwood.sed	Cr	Blackwood Creek (Placer County)	Bedded Sediment	Various	9 2007	11	17272 total

T Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi ²	WLA tons mi ² yr	
6	R6.SquawCk.sed	R	Squaw Creek (Placer County)	Sedimentation /controllable sources	Various – basin plan amendment	4 13 2006	8.2	10,900

Adopted TMDLs for Construction Sediment Sources

Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Area mi ²	Waste load Allocation tons mi ² yr
8	R	Newport Bay San Diego Creek Watershed	Sedimentation	Construction Land Development	1999	2.24 (1432 acres)	125,000 tons per Year (no more than 13,000 tons per year from construction sites)

APPENDIX 5: Glossary

Active Areas of Construction

All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

Active Treatment System (ATS)

A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

Acute Toxicity Test

A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

Air Deposition

Airborne particulates from construction activities.

Approved Signatory

A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;
5. For a public university: an authorized university official;
6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or
7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

Beneficial Uses

As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT)

As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)

As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

Best Professional Judgment (BPJ)

The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

Best Management Practices (BMPs)

BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Chain of Custody (COC)

Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Coagulation

The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

Common Plan of Development

Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

Daily Average Discharge

The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

Debris

Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

Direct Discharge

A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

Discharger

The Legally Responsible Person (see definition) or entity subject to this General Permit.

Dose Rate (for ATS)

In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

Drainage Area

The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

Effluent

Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

Effluent Limitation

Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Erosion

The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

Erosion Control BMPs

Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Field Measurements

Testing procedures performed in the field with portable field-testing kits or meters.

Final Stabilization

All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

First Order Stream

Stream with no tributaries.

Flocculants

Substances that interact with suspended particles and bind them together to form flocs.

Good Housekeeping BMPs

BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Grading Phase (part of the Grading and Land Development Phase)

Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

Hydromodification

Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

Identified Organisms

Organisms within a sub-sample that is specifically identified and counted.

Inactive Areas of Construction

Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Index Period

The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year, and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

K Factor

The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

Legally Responsible Person

The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities

shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.
2. In addition to the above, the following persons or entities may also serve as an LRP:
 - a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;
 - b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);
 - c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or
 - d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

Likely Precipitation Event

Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).

Maximum Allowable Threshold Concentration (MATC)

The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity

testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

Natural Channel Evolution

The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass through the suite of evolution stages, they will rest in a new state of equilibrium.

Non-Storm Water Discharges

Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

Non-Visible Pollutants

Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen through observation (ex: chlorine). Such pollutants being discharged are not authorized.

Numeric Action Level (NAL)

Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

Original Sample Material

The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

pH

Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Post-Construction BMPs

Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)

Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

Project

Qualified SWPPP Developer

Individual who is authorized to develop and revise SWPPPs.

Qualified SWPPP Practitioner

Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

Qualifying Rain Event

Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

R Factor

Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

Rain Event Action Plan (REAP)

Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

Remaining Sub sampled Material

The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

Routine Maintenance

Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Runoff Control BMPs

Measures used to divert runoff from offsite and runoff within the site.

Run-on

Discharges that originate offsite and flow onto the property of a separate project site.

Revised Universal Soil Loss Equation (RUSLE)

Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

Sampling and Analysis Plan

Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment

Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation

Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

Sediment Control BMPs

Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

Settleable Solids (SS)

Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

Sheet Flow

Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

Site**Soil Amendment**

Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

Streets and Utilities Phase

Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

Structural Controls

Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

Suspended Sediment Concentration (SSC)

The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)

The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Toxicity

The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity

The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

Vertical Construction Phase

The Build out of structures from foundations to roofing, including rough landscaping.

Waters of the United States

Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.¹

Water Quality Objectives (WQO)

Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

¹ The application of the definition of “waters of the United States” may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

APPENDIX 6: Acronym List

ASBS	Areas of Special Biological Significance
ASTM	American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils
ATS	Active Treatment System
BASMAA	Bay Area Storm water Management Agencies Association
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
CAFO	Confined Animal Feeding Operation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	NPDES General Permit for Storm Water Discharges Associated with Construction Activities
CIWQS	California Integrated Water Quality System
CKD	Cement Kiln Dust
COC	Chain of Custody
CPESC	Certified Professional in Erosion and Sediment Control
CPSWQ	Certified Professional in Storm Water Quality
CSMP	Construction Site Monitoring Program
CTB	Cement Treated Base
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
CWP	Center for Watershed Protection
DADMAC	Diallyldimethyl-ammonium chloride
DDNR	Delaware Department of Natural Resources
DFG	Department of Fish and Game
DHS	Department of Health Services
DWQ	Division of Water Quality
EC	Electrical Conductivity
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
HSPF	Hydrologic Simulation Program Fortran
JTU	Jackson Turbidity Units
LID	Low Impact Development
LOEC	Lowest Observed Effect Concentration
LRP	Legally Responsible Person
LUP	Linear Underground/Overhead Projects

MATC	Maximum Allowable Threshold Concentration
MDL	Method Detection Limits
MRR	Monitoring and Reporting Requirements
MS4	Municipal Separate Storm Sewer System
MUSLE	Modified Universal Soil Loss Equation
NAL	Numeric Action Level
NEL	Numeric Effluent Limitation
NICET	National Institute for Certification in Engineering Technologies
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
PAC	Polyaluminum chloride
PAM	Polyacrylamide
PASS	Polyaluminum chloride Silica/sulfate
POC	Pollutants of Concern
PoP	Probability of Precipitation
POTW	Publicly Owned Treatment Works
PRDs	Permit Registration Documents
PWS	Planning Watershed
QAMP	Quality Assurance Management Plan
QA/QC	Quality Assurance/Quality Control
REAP	Rain Event Action Plan
Regional Board	Regional Water Quality Control Board
ROWD	Report of Waste Discharge
RUSLE	Revised Universal Soil Loss Equation
RW	Receiving Water
SMARTS System	Storm water Multi Application Reporting and Tracking
SS	Settleable Solids
SSC	Suspended Sediment Concentration
SUSMP	Standard Urban Storm Water Mitigation Plan
SW	Storm Water
SWARM	Storm Water Annual Report Module
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Storm Water Management Model
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TC	Treatment Control
TDS	Total Dissolved Solids

TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACOE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDID	Waste Discharge Identification Number
WDR	Waste Discharge Requirements
WLA	Waste Load Allocation
WET	Whole Effluent Toxicity
WRCC	Western Regional Climate Center
WQBEL	Water Quality Based Effluent Limitation
WQO	Water Quality Objective
WQS	Water Quality Standard

APPENDIX 7: State and Regional Water Resources Control Board Contacts

NORTH COAST REGION (1)
5550 Skylane Blvd, Ste. A
Santa Rose, CA 95403
(707) 576-2220 FAX: (707)523-0135

SAN FRANCISCO BAY REGION (2)
1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300 FAX: (510) 622-2640

CENTRAL COAST REGION (3)
895 Aerovista Place, Ste 101
San Luis Obispo, CA 93401
(805) 549-3147 FAX: (805) 543-0397

LOS ANGELES REGION (4)
320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-6600 FAX: (213) 576-6640

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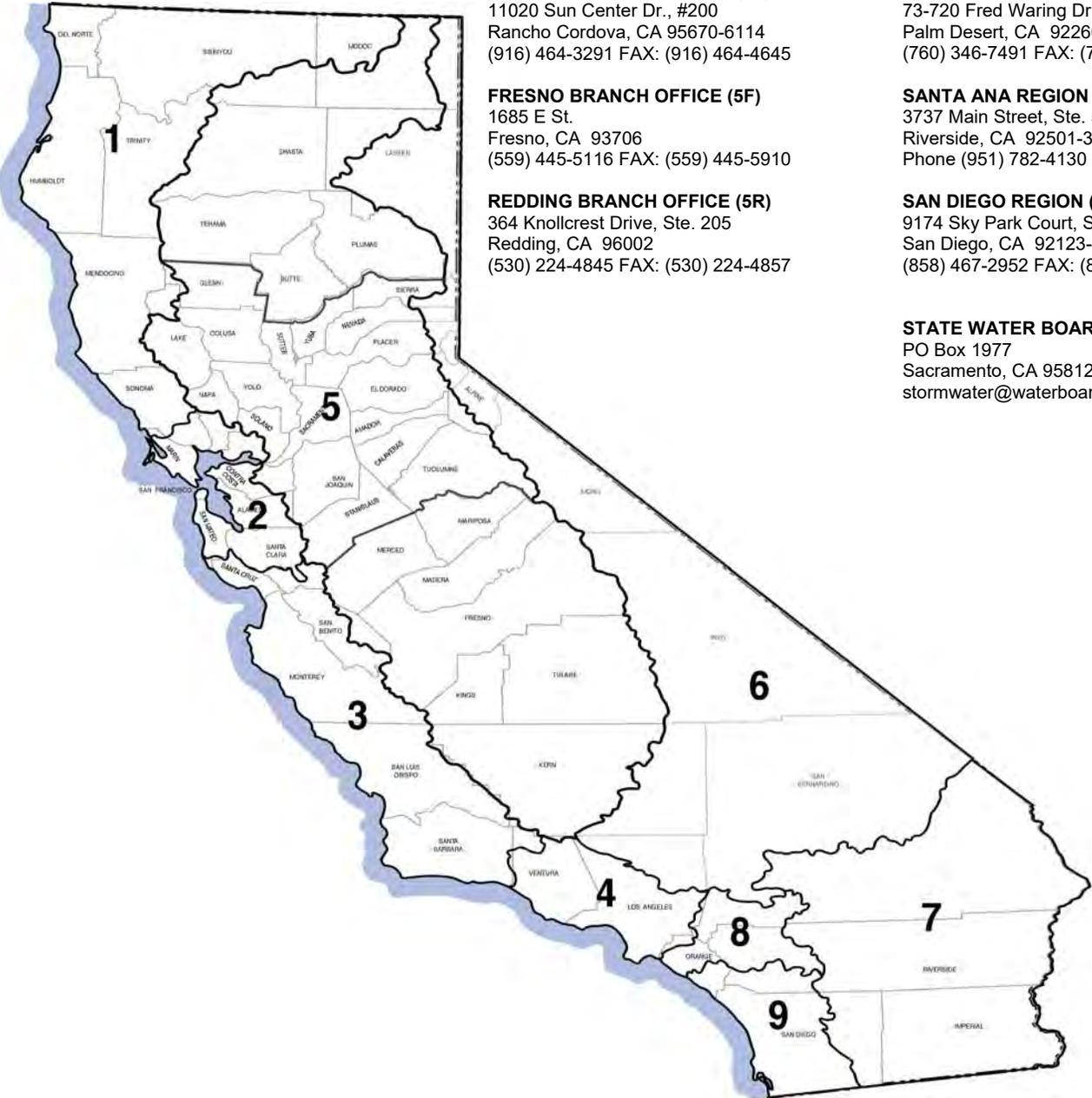
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ATTACHMENT 38

CONFORMED (04/07/15)

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
ORDER 2012-0011-DWQ

AS AMENDED BY
ORDER WQ 2014-0006-EXEC,
ORDER WQ 2014-0077-DWQ, AND
ORDER WQ 2015-0036-EXEC

NPDES NO. CAS000003
**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STATEWIDE STORM WATER PERMIT
WASTE DISCHARGE REQUIREMENTS (WDRS)
FOR
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

The State Water Resources Control Board adopted Order 2012-0011-DWQ on:	September 19, 2012
The Executive Director of the State Water Resources Control Board issued Order WQ 2014-0006-EXEC on:	January 17, 2014
The State Water Resources Control Board adopted Order WQ 2014-0077-DWQ on:	May 20, 2014
The Executive Director of the State Water Resources Control Board issued Order WQ 2015-0036-EXEC on:	April 7, 2015
The amendments to Order 2012-0011-DWQ contained in Order 2015-0036-DWQ are effective on:	April 7, 2015

CERTIFICATION

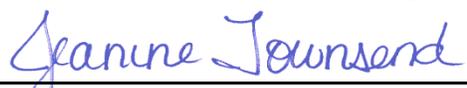
The undersigned, Clerk to the State Water Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 19, 2012.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
ORDER 2012-0011-DWQ

AS AMENDED BY
ORDER WQ 2014-0006-EXEC,
ORDER WQ 2014-0077-DWQ, AND
ORDER WQ 2015-0036-EXEC

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**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STATEWIDE STORM WATER PERMIT
WASTE DISCHARGE REQUIREMENTS (WDRS)
FOR
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

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APPENDIX: FACT SHEET FOR NPDES PERMIT AND WASTE DISCHARGE
REQUIREMENTS FOR STATE OF CALIFORNIA, DEPARTMENT OF
TRANSPORTATION

- ATTACHMENT I: INCIDENT REPORT FORM
- ATTACHMENT II: MONITORING CONSTITUENT LIST
- ATTACHMENT III: ASBS PRIORITY DISCHARGE LOCATIONS
- ATTACHMENT IV: TMDL IMPLEMENTATION REQUIREMENTS
- ATTACHMENT V: REGIONAL WATER BOARD SPECIFIC REQUIREMENTS
- ATTACHMENT VI: STANDARD PROVISIONS
- ATTACHMENT VII: ACRONYMS & ABBREVIATIONS
- ATTACHMENT VIII: GLOSSARY
- ATTACHMENT IX: REPORTING REQUIREMENTS
- ATTACHMENT X: References

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
ORDER 2012-0011-DWQ

AS AMENDED BY
ORDER WQ 2014-0006-EXEC,
ORDER WQ 2014-0077-DWQ, AND
ORDER WQ 2015-0036-EXEC

NPDES NO. CAS000003
**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STATEWIDE STORM WATER PERMIT
WASTE DISCHARGE REQUIREMENTS (WDRS)
FOR
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

FINDINGS

The State Water Resources Control Board (State Water Board) finds that:

Permit Application

1. The State of California, Department of Transportation (hereafter the Department) has applied to the State Water Board for reissuance of its statewide storm water permit and waste discharge requirements to discharge storm water and permitted non-storm water to waters of the United States under the National Pollutant Discharge Elimination System (NPDES) permit program.

Background and Authority

Permit Background

2. Prior to issuance of the Department's first statewide storm water permit (Order No. 99-06-DWQ), the Regional Water Boards regulated storm water discharges from the Department's storm drain systems with individual permits. On July 15, 1999, the State Water Board adopted a statewide permit to consolidate storm water permits previously adopted by the Regional Water Boards. This statewide permit regulates storm water and non-storm water discharges from the Department's properties and facilities, and discharges associated with operation and maintenance of the State highway system. The Department's properties include all Right-of-Way (ROW) owned by the Department. The Department's facilities include, but are not limited to, maintenance stations/yards, equipment storage areas, storage facilities, fleet vehicle parking and maintenance areas and warehouses with material storage areas.

Federal Authority

3. In 1987, the United States Congress amended the federal Clean Water Act (CWA) and added section 402(p), which established a framework for regulating municipal and

industrial storm water discharges under the NPDES Permit Program. On November 16, 1990, the U.S. Environmental Protection Agency (U.S. EPA) promulgated federal regulations for controlling pollutants in storm water runoff discharges (known as Phase I storm water regulations). Phase I storm water regulations require permit coverage for storm water discharges from large and medium Municipal Separate Storm Sewer Systems (MS4s), certain categories of industrial facilities, and construction activities disturbing five or more acres of land. On December 8, 1999, U.S. EPA promulgated regulations, known as Phase II storm water regulations, which require NPDES permit coverage for storm water discharges from small MS4s and construction sites which disturb one to five acres of land.

State Authority

4. California Water Code (Wat. Code) section 13376 provides that any person discharging or proposing to discharge pollutants to waters of the United States within the jurisdiction of the state shall apply for and obtain Waste Discharge Requirements (WDRs). (For this permit, the State term “WDRs” is equivalent to the federal term “NPDES permits” as used in the Clean Water Act). The State Water Board issues this Order pursuant to section 402 of the Clean Water Act and implementing regulations adopted by U.S. EPA and chapter 5.5, division 7 of the California Water Code (commencing with § 13370 et seq.). It shall serve as an NPDES permit for point source discharges to surface waters. This Order also serves as WDRs pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with § 13260 et seq.). Applicable State regulations on discharges of waste are contained in the California Code of Regulations (Cal. Code Regs.), tit. 23, Division 3, Chapter 9.

Storm Water Definition

Storm Water Discharge

5. Storm water discharges consist only of those discharges that originate from precipitation events. Storm water is defined in the Code of Federal Regulations (40 C.F.R. § 122.26(b)(13)) as storm water runoff, snowmelt runoff, and surface runoff and drainage. During precipitation events, storm water picks up and transports pollutants into and through MS4s and ultimately to waters of the United States.

Non-Storm Water Discharge

6. Non-storm water discharges consist of all discharges from an MS4 that do not originate from precipitation events.

Generally, non-storm water discharges to an MS4 are prohibited, conditionally exempt from prohibition, or regulated separately by an NPDES permit. The categories of conditionally exempt non-storm water discharge are specified at 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(1). Non-storm water discharges that are regulated by a separate NPDES permit are not subject to the discharge prohibition. Prohibited non-storm water discharges include conditionally exempt discharges that are found to be a source of pollutants to waters of the United States. Illicit discharges must also be prohibited. An illicit discharge is defined in 40 Code of Federal Regulations section 122.26(b)(2) as "any discharge to a municipal storm sewer that is not composed entirely of storm water except

discharges pursuant to an NPDES permit (other than the NPDES Permit for discharges from the Municipal Separate Storm Sewer System) and discharges resulting from fire fighting activities." Provision B of this Order addresses non-storm water discharge.

Non-storm water discharges to an MS4 with a discharge to an ASBS are subject to a different set of conditions as stated in Finding 22.a.

Performance Standards

Performance Standard for Discharges from MS4s

7. Clean Water Act section 402(p) establishes performance standards for discharges from MS4s. Clean Water Act section 402(p)(3)(B) requires that municipal permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." This Order prohibits storm water discharges that do not comply with the maximum extent practicable (MEP) standard.
8. Compliance with the MEP standard involves applying Best Management Practices (BMPs) that are effective in reducing or eliminating the discharge of pollutants to the waters of the United States. MEP emphasizes pollutant reduction and source control BMPs to prevent pollutants from entering storm water runoff. MEP may require treatment of the storm water runoff if it contains pollutants. BMP development is a dynamic process, and the menu of BMPs contained in a SWMP may require changes over time as experience is gained and/or the state of the science and art progresses. MEP is the cumulative effect of implementing, evaluating, and making corresponding changes to a variety of technically appropriate and economically feasible BMPs, ensuring that the most appropriate controls are implemented in the most effective manner. The State Water Board has held that "MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the costs would be prohibitive." (SWRCB, 2000b).

Permit Coverage and Scope

Discharges Regulated by this Permit

9. This Order regulates the following discharges:
 - a. Storm water discharges from all Department-owned MS4s;
 - b. Storm water discharges from the Department's vehicle maintenance, equipment cleaning operations facilities and any other non-industrial facilities with activities that have the potential of generating significant quantities of pollutants; and
 - c. Certain categories of non-storm water discharges as listed under provision B. of this Order.

This Order does not regulate storm water discharges from leased office spaces, Department owned batch plants or any other industrial facilities, as industrial facilities defined in the Statewide Industrial General Permit. The Department will obtain coverage

for storm water discharges associated with industrial activities under the Statewide Industrial General Permit for each batch plant and industrial facility, and shall comply with applicable requirements. While this Order does not regulate storm water discharges associated with industrial activities, it does impose contractor requirements for certain industrial facilities.

This Order does not regulate discharges from the Department's construction activities, including dewatering effluent discharges from construction projects. Instead, the Department will obtain coverage for storm water discharges associated with construction activities under Order No. 2009-0009-DWQ Statewide Construction General Permit. While this Order does not regulate storm water discharges associated with construction activities, it does impose electronic filing, notification, reporting and contractor requirements for certain construction projects, and imposes limitations on types of materials that may be used during construction which may have an impact on post-construction discharges. Any discharges from a site occurring after completion of construction are fully subject to the requirements of this Order.

Some Regional Water Boards have issued specific requirements for dewatering effluent discharges in their regions. The Department will consult with the appropriate Regional Water Board and comply with the applicable dewatering requirements in each region.

Department Activities and Discharges

Department Activities

10. The Department is primarily responsible for the design, construction, management, and maintenance of the State highway system including; freeways, bridges, tunnels, and facilities such as corporation yards, maintenance facilities, rest areas, weigh stations, park and ride lots, toll plazas and related properties. The Department is also responsible for initial emergency spill response and cleanup for unauthorized discharges of waste within the Department's ROW.

Department Discharges

11. The Department's discharges include storm water and non-storm water discharges generated from:
 - a. Maintenance and operation of State-owned ROW;
 - b. Department storage and disposal areas;
 - c. Department facilities;
 - d. Department Airspaces; and
 - e. Other properties and facilities owned and operated by the Department.

The Department discharges either directly to surface waters or indirectly through municipal storm water conveyance systems. These surface waters include creeks, rivers, reservoirs, wetlands, saline sinks, lagoons, estuaries, bays, and the Pacific Ocean and tributaries thereto, some or all of which are waters of the United States as defined in 40 Code of

Federal Regulations section 122.2. As specified, this Order regulates the Department's municipal storm water and non-storm water discharges.

Potential Pollutants

12. Discharges of storm water and non-storm water from Department properties, facilities, and activities have been shown to contribute pollutants to waters of the United States. As such, these discharges may be causing or threatening to cause violations of water quality objectives and can have damaging effects on human health and aquatic ecosystems. The quality and quantity of these discharges vary considerably and are affected by many environmental factors including hydrology, geology, land use, climatology and chemistry, and by controllable management factors including maintenance practices, spill prevention and response activities, public education (i.e., concerning trash and other storm water pollutants) and pollution prevention.

Pollutant sources from the Department properties, facilities, and activities include motor vehicles, highway surface materials such as fine particles of asphalt and concrete, highway maintenance products, construction activities, erodible shoulder materials, eroding cut and filled slopes, abrasive sand and deicing salts used in winter operations, abraded tire rubber, maintenance facilities, illegal connections, illegal dumping, fluids from accidents and spills, and landscape care products.

Pollutant categories include, but are not limited to, metals (such as copper, lead, and zinc), synthetic organic compounds (pesticides), Polycyclic Aromatic Hydrocarbons (PAHs) from vehicle emissions, oil and grease, Total Petroleum Hydrocarbons (TPH), sediment, nutrients (nitrogen and phosphorus fertilizers), debris (trash and litter), pathogens, and oxygen demanding substances (decaying vegetation, animal waste, and other organic matter).

Characterization Monitoring

13. Under the previous permit (Order No. 99-06-DWQ), the Department conducted a comprehensive, multi-component storm water monitoring program. The Department monitored and collected pollutant characterization information at more than 180 sites statewide, yielding more than 60,000 data points. The Department used the data to evaluate the effectiveness of the Department's maintenance facility pollution prevention plans and highway operation control measures. This information is also used to identify pollutants of concern in the Department's discharges.

Department Discharge Characterization Studies

14. The Department compared the monitoring results from the 2002 and 2003 Runoff Characterization Studies (California Department of Transportation, 2003)¹ to California Toxics Rule (CTR) objectives and to several surface water quality objectives considered potentially relevant to storm water runoff quality. The Department prioritized constituents as high, medium, and low, according to a percentage estimate by which the most stringent water quality objective was exceeded. The Department identified lead, copper, zinc,

¹ References are found in Attachment X of this Order.

aluminum, diazinon, chlorpyrifos, and iron as high priority constituents in the Department's runoff. The sources of other water quality objectives considered were:

- a. National Primary Drinking Water Maximum Contaminant Levels (40 C.F.R., § 141.1);
- b. U.S. EPA Action Plan for Beaches and Recreational Waters;
- c. U.S. EPA Aquatic Life Criteria;
- d. California Department of Public Health Maximum Contaminant Levels; and California Department of Fish and Game Recommended Criteria for Diazinon and Chlorpyrifos.

Department Discharges that are Subject to MS4 Permit Regulations

15. An MS4 is a conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains. An MS4 is designed or used for collecting or conveying storm water. It is not a combined sanitary sewer and is not part of a Publicly Owned Treatment Works (POTW). Clean Water Act section 402(p) and 40 Code of Federal Regulations section 122.26 (a)(v) give the State authority to regulate discharges from an MS4 on a system-wide or jurisdiction-wide basis. All MS4s under the Department's jurisdiction are considered one system, and are regulated by this Order. Therefore, all storm water and exempted and conditionally exempted non-storm water discharges from the Department owned MS4 are subject to the requirements in this Order.

Maintenance and Construction Activities not Subject to the Construction General Permit

16. Some maintenance and construction activities such as roadway and parking lot repaving and resurfacing may not be subject to the Construction General Permit. Such activities may involve grinding and repaving the existing surface and have the potential to mobilize pollutants, even though it may not involve grading or land disturbance. The Department's Maintenance Staff Guide (Department, 2007b), Project Planning and Design Guide (Department, 2010) and the California Stormwater Quality Association (CASQA) California Construction Stormwater BMP Handbook (CASQA, 2009) specify BMPs for paving and grinding operations. The Department is required to implement BMPs for such operations to control the discharge of pollutants to the MEP.

Department Construction Projects Involving Lead Contaminated Soils

17. Department construction projects may involve soils that contain lead in quantities that meet the State definition of hazardous waste but not the federal definition. The Department of Toxic Substances Control (DTSC) has issued a variance (V09HQSCD006) effective July 1, 2009, allowing the Department to place soil containing specific concentrations of aerially deposited lead under pavement or clean soil. In addition to complying with the terms of the variance, the Department also needs to notify the appropriate Regional Water Boards to determine the appropriate regulation of these soils.
18. Past monitoring data show that storm water runoff from the Department's facilities contains pollutants that may adversely affect the beneficial uses of receiving waters. Facilities not

subject to the Industrial General Permit are required to implement BMPs to reduce the discharge of pollutants from these facilities to the MEP.

Provisions of This Order

19. Storm water discharges from MS4s are highly variable in frequency, intensity, and duration, and it is difficult to characterize the amount of pollutants in the discharges. In accordance with 40 Code of Federal Regulations section 122.44(k)(2), the inclusion of BMPs in lieu of numeric effluent limitations is appropriate in storm water permits. This Order requires implementation of BMPs to control and abate the discharge of pollutants in storm water to the MEP. To assist in determining if the BMPs are effectively achieving MEP standards, this Order requires effluent and receiving water monitoring. The monitoring data will be used to determine the effectiveness of the applied BMPs and to make appropriate adjustments or revisions to BMPs that are not effective.

Receiving Water Limitations

20. The effect of the Department's storm water discharges on receiving water quality is highly variable. For this reason, this Order requires the Department to implement a storm water program designed to achieve compliance with water quality standards, over time through an iterative approach. If discharges are found to be causing or contributing to an exceedance of an applicable Water Quality Standard, the Department is required to revise its BMPs (including use of additional and more effective BMPs).

Discharges to Areas of Special Biological Significance

21. The State Water Board has designated 34 coastal marine waters as Areas of Special Biological Significance (ASBS) in the California Ocean Plan. An ASBS is a coastal area requiring protection of species or biological communities. The Department discharges storm water into the following ASBS:
- a. Redwoods National Park ASBS
 - b. Saunders Reef ASBS
 - c. James V. Fitzgerald ASBS
 - d. Año Nuevo ASBS
 - e. Carmel Bay ASBS
 - f. Point Lobos ASBS
 - g. Julia Pfeiffer Burns ASBS
 - h. Salmon Creek Coast ASBS
 - i. Laguna Point to Latigo Point ASBS
 - j. Irvine Coast ASBS
22. The Ocean Plan prohibits waste discharges into ASBS. The Ocean Plan allows the State Water Board to grant exceptions to this prohibition, provided that: (1) the exception will not compromise protection of ocean waters for beneficial uses, and (2) the public interest will be served. The Department has applied for and been granted an exception under the General Exception for Storm Water and Non-Point Source Discharges to ASBS. The exception

allows the continued discharge into ASBS provided the Department complies with the special protections specified in the General Exception.

- 22a. Non-storm water discharges to ASBS are prohibited except as specified in the General Exception. Certain enumerated non-storm water discharges are allowed under the General Exception if essential for emergency response purposes, structural stability, slope stability, or if occur naturally. In addition, an NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. This Order allows utility vault discharges to segments of the Department MS4 with a direct discharge to an ASBS, provided the discharge is authorized by the General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surface Water, NPDES No. CAG 990002. The State Water Board is in the process of reissuing the General NPDES Permit for Utility Vaults. As part of the renewal, the State Water Board will require a study to characterize representative utility vault discharges to an MS4 with a direct discharge to an ASBS and will impose conditions on such discharges to ensure the discharges do not alter natural ocean water quality in the ASBS. Given the limited number of utility vault discharges to MS4s that discharge directly to an ASBS, the State Water Board finds that discharges from utility vaults and underground structures to a segment of the Department's MS4 with a direct discharge to an ASBS are not expected to result in the MS4 discharge causing a substantial alteration of natural ocean water quality in the ASBS in the interim period while the General NPDES Permit for Discharges from Utility Vaults is renewed and the study is completed. However, if a Regional Water Board determines a specific discharge from a utility vault or underground structure does alter the natural ocean water quality in an ASBS, the Regional Water Board may prohibit the discharge as specified in this Order.

New Development and Re-development Design Standards

23. 40 Code of Federal Regulations section 122.26(d)(2)(iv)(A)(2) requires municipal storm water permittees to implement a new development and redevelopment program to reduce the post-construction generation and transport of pollutants. Development can involve grading and soil compaction, an increase in impervious surfaces (roadways, roofs, sidewalks, parking lots, etc.), and a reduction of vegetative cover, all of which increase the amount of rainfall that ends up as runoff, and decrease the particle size and the load of watershed sediment. The increase in runoff generally leads to increased pollutant loading from watersheds, even if post-construction pollutant concentrations are similar to pre-construction concentrations. The accelerated erosion and deposition resulting from an increase in runoff and a decrease in the size and load of watershed sediment generally causes a stream channel to respond by deepening and widening and detaching from the historic floodplain. The magnitude of response depends on geology, land use, and channel stability at the time of the watershed disturbance. Increased pollutant loads and alteration of the runoff/sediment balance have the potential to negatively impact the beneficial uses of receiving waters including streams, lakes, wetlands, ground water, oceans, bays and estuaries, and the biological habitats supported by these aquatic systems.

24. Department projects have the potential to negatively impact stream channels and downstream receiving waters through modification of the existing runoff hydrograph. The hydromodification requirements in this Order are “effluent limitations,” which are defined by the Clean Water Act to include any restriction on the quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources (C.W.A., § 502(11)).
25. Waters of the United States supporting the beneficial use of fish migration could be adversely impacted by improperly designed or maintained stream crossings, or through natural channel evolution processes affected by Department activities. This Order requires the Department to submit to the State Water Board the annual report required under Article 3.5 of the Streets and Highways Code reporting on the Department’s progress in locating, assessing, and remediating barriers to fish passage.
26. Low Impact Development (LID) is a sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID uses site design and storm water management to maintain the site’s pre-project runoff rates and volumes by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source.
27. On October 5, 2000, the State Water Board adopted a precedential decision concerning the use of Standard Urban Storm Water Mitigation Plans (SUSMPs) (Order WQ 2000-11). The SUSMP in that case required sizing design standards for post-construction BMPs for specific categories of new development and redevelopment projects. Order WQ 2000-11 found that provisions in the SUSMPs, as revised in the order, reflected MEP. The LID requirements, post-construction requirements for impervious surface and the design standards in this Order are consistent with Order WQ 2000-11 and meet the requirement for development of a SUSMP.

Self-Monitoring Program

28. Effluent and receiving water monitoring are necessary to evaluate the effectiveness of BMP measures and to track compliance with water quality standards. This Order requires the Department to conduct effluent and receiving water monitoring.

Storm Water Management Plan (SWMP)

29. The SWMP describes the procedures and practices that the Department proposes to reduce or eliminate the discharge of pollutants to storm drainage systems and receiving waters. On May 17, 2001, the State Water Board approved a Storm Water Management Plan submitted by the Department. That SWMP was updated in 2003 (Department, 2003c) and the updates were approved by the Executive Director of the State Water Board on February 13, 2003. On January 15, 2004, the Department submitted a proposed Storm Water Management Plan as part of its NPDES permit application to renew its previous statewide storm water permit (Order No. 99-06-DWQ). The State Water Board and Regional Water Board staff and the Department discussed and revised Best Management

Practices (BMP) controls and many other components proposed in each section of the SWMP during numerous meetings from January 2004 to 2006. The Department submitted a revised SWMP in June 2007. The 2004 and 2007 SWMPs have not been approved by the State Water Board and the Department has continued to implement the 2003 SWMP. The Department is in the process of revising aspects of the 2003 SWMP to address the Findings of Violation and Order for Compliance issued by U.S. EPA in 2011 (U.S. EPA Docket No. CWA-09-2011-0001).

30. The SWMP and any future modifications or revisions are integral to and enforceable components of this Order. Any documents incorporated into the SWMP by reference that specify the manner in which the Department will implement the SWMP shall be consistent with the requirements of this Order.
31. This Order requires the Department to submit an Annual Report each year to the State Water Board. The Annual Report serves the purpose of evaluating, assessing, and reporting on each relevant element of the storm water program, and revising activities, control measures, BMPs, and measurable objectives, as necessary, to meet the applicable standards.
32. Revisions to the SWMP requiring approval by the State Water Board's Executive Director are subject to public notice and the opportunity for a public hearing.

Total Maximum Daily Load (TMDL) Requirements

33. TMDLs are calculations of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations or LAs), plus the contribution from background sources and a margin of safety (40 C.F.R., § 130.2, subd.(i)). Discharges from the Department's MS4 are considered point source discharges.
34. This Order implements U.S. EPA-approved or U.S. EPA-established TMDLs applicable to the Department. This Order requires the Department to comply with all TMDLs listed in Attachment IV. Attachment IV identifies TMDLs adopted by the Regional Water Boards and approved by the State Water Board and U.S. EPA that assign the Department a Waste Load Allocation (WLA) or that specify the Department as a responsible party in the implementation plan. In addition, Attachment IV identifies TMDLs established by U.S. EPA that specify the Department as a responsible party or that identify NPDES permitted storm water sources or point sources generally, or identify roads generally, as subject to the TMDL. In accordance with 40 Code of Federal Regulations section 122.44, subdivision (d)(1)(vii)(B), NPDES water quality-based effluent limitations (WQBELs) must be consistent with the assumptions and requirements of available TMDL WLAs. In addition, Water Code section 13263, subdivision (a), requires that waste discharge requirements implement any relevant water quality control plans. The TMDL requirements in this Order are consistent with the assumptions and requirements of the TMDLs applicable to the Department.

35. TMDL WLAs in this Order are not limited by the MEP standard. Due to the nature of storm water discharges, and the typical lack of information on which to base numeric WQBELs, federal regulations (40 C.F.R., § 122.44, subd. (k)(2)) allow for the implementation of BMPs to control or abate the discharge of pollutants from storm water.
36. The Department reported in its 2008-09 Annual Report to the State Water Board that it is subject to over 50 TMDLs and is in the implementation phase of over 30 TMDLs. The State Water Board has since determined that the Department is subject to 84 TMDLs. WLAs and LAs for some TMDLs are shared jointly among several dischargers, with no specific mass loads assigned to individual dischargers. In some of these cases, multiple dischargers are assigned a grouped or aggregate waste load allocation, and each discharger is jointly responsible for complying with the aggregate waste load allocation.
37. The high variance in the level of detail and specificity in the TMDLs developed by the Regional Water Boards and U.S. EPA necessitates the development of more specific permit requirements in many cases, including deliverables and required actions, derived from each TMDL's WLA and implementation requirements. These requirements will provide clarity to the Department regarding its responsibilities for compliance with applicable TMDLs. The development of TMDL-specific permit requirements is subject to notice and a public comment period. Because most of the TMDLs were developed by the Regional Water Boards, and because some of the WLAs are shared by multiple dischargers, the development of TMDL-specific permit requirements has been coordinated initially at the Regional Water Board level.
38. Attachment IV specifies TMDL-specific permit implementation requirements for the Lake Tahoe sediment and nutrients TMDL, Napa River Sediment TMDL, Sonoma Creek Sediment TMDL, and the Lake Elsinore and Canyon Lake Nutrients TMDL. These requirements are consistent with the assumptions and requirements of applicable WLAs assigned to the Department, and with the adopted and approved TMDL, Basin Plan, and related Regional Water Board Orders and Resolutions.
39. For all remaining TMDLs identified in Attachment IV, the Regional Water Boards, in consultation with the State Water Board and the Department, developed categorical pollutant permit requirements. The Fact Sheet contains supporting analyses explaining how the proposed categorical pollutant permit requirements will implement the TMDL and are consistent with the assumptions and requirements of any applicable WLA and how the BMPs will be sufficient to implement applicable WLAs. Following a notice and comment period, Attachment IV of this Order and the Fact Sheet was reopened consistent with provision E.11.c. for incorporation of these requirements and supporting analysis into the Order and Fact Sheet.
40. This Order specifies the requirements to be followed for the Comprehensive TMDL Monitoring Plan. TMDL monitoring requirements are found in Attachment IV, Section III.A. The Regional Water Boards may require additional monitoring through Regional Water Board orders pursuant to Water Code section 13383.

41. Attachment IV may additionally be reopened consistent with provision E.11.b. of this Order for incorporation of newly adopted TMDLs or amendments to existing TMDLs into the Permit.

Non-Compliance

42. NPDES regulations require the Department to notify the Regional Water Board and/or State Water Board of anticipated non-compliance with this Order (40 C.F.R., § 122.41(l)(2)); or of instances of non-compliance that endanger human health or the environment (40 C.F.R., § 122.41(l)(6)).

Regional Water Board and State Water Board Enforcement

43. The Regional Water Boards and the State Water Board will enforce the provisions and requirements of this Order.

Region Specific Requirements

Basin Plans

44. Each Regional Water Board has adopted a Basin Plan for the watersheds within its jurisdiction. Basin Plans identify the beneficial uses for each water body and the water quality objectives necessary to protect them. The Department is subject to the prohibitions and requirements of each Basin Plan.

Region Specific Requirements

45. Regional Water Boards have identified Region-specific water quality issues and concerns pertaining to discharges from the Department's properties. Region-specific requirements to address these issues are included in this Order.

Local Municipalities and Preemption

46. Storm water and non-storm water from MS4s that are owned and managed by other NPDES permitted municipalities may discharge to storm water conveyance systems owned and managed by the Department. This Order does not supersede the authority of the Department to prohibit, restrict, or control storm water discharges and conditionally exempt non-storm water discharges to storm drain systems or other watercourses within its jurisdiction as allowed by State and federal law.

Storm water and non-storm water from the Department's ROW, properties, facilities, and activities may discharge to storm water conveyance systems managed by other NPDES permitted municipalities. This Order does not preempt or supersede the authority of the permitted municipalities to prohibit, restrict, or control storm water discharges and conditionally exempt non-storm water discharges to storm drain systems or other watercourses within their jurisdiction as allowed by State and federal law.

Anti-Degradation Policy

47. 40 Code of Federal Regulations section 131.12 requires that state water quality standards include an anti-degradation policy consistent with the federal policy. The State Water Board established California's anti-degradation policy in State Water Board Resolution No.

68-16. Resolution No. 68-16 incorporates the federal anti-degradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plans implement, and incorporate by reference, both the State and federal anti-degradation policies. This Order is consistent with the anti-degradation provision of 40 Code of Federal Regulations section 131.12 and State Water Board Resolution No. 68-16.

Endangered Species Act

48. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2115.5) or the Federal Endangered Species Act (16 U.S.C.A., §§ 1531 to 1544). This Order requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the United States. The Department is responsible for meeting all requirements of the applicable Endangered Species Act.

California Environmental Quality Act (CEQA)

49. The action to adopt an NPDES Permit is exempt from the provisions of CEQA (Public Resources Code, § 21100, et. seq.), pursuant to section 13389 of the California Water Code (County of Los Angeles et al., v. California Water Boards et al., (2006), 143 Cal.App.4th 985).

Public Notification

50. The Department, interested agencies, and persons have been notified of the State Water Board's intent to reissue requirements for storm water discharges and have been provided an opportunity to submit their written comments and recommendations. State Water Board staff prepared a Fact Sheet and Response to Comments, which are incorporated by reference as part of this Order.

Public Hearing

51. The State Water Board, through public testimony in public meetings and in written form, has received and considered all comments pertaining to this Order.

Cost of Compliance

52. The State Water Board has considered the costs of complying with this Order and whether the required BMPs meet the minimum "maximum extent practicable" standard required by federal law. The MEP approach is an evolving, flexible, and advancing concept, which considers technical and economic feasibility. Because of the numerous advances in storm water regulation and management and the size of the Department's MS4, the Order does not require the Department to fully incorporate and implement all advances in a single permit term, but takes an incremental approach that allows for prioritization of efforts for the most effective use of the increased, but nevertheless limited, Department funds. This Order will have an effect on costs to the Department above and beyond the costs from the Department's prior permit. Such costs will be incurred in complying with the post-

construction, hydrograph modification, Low Impact Development, and monitoring and reporting requirements of this Order. Additional costs will also be incurred in correcting non-compliant discharges.² These incremental costs are necessary to advance the controls and management of storm water by the Department and to facilitate reduction of the discharge of pollutants to the MEP.

53. This Order supersedes Order No. 99-06-DWQ.

54. This Order serves as an NPDES permit pursuant to Clean Water Act section 402 or amendments thereto, and shall become effective on July 1, 2013, provided that the Regional Administrator, U.S. EPA, Region IX, expresses no objections.

IT IS HEREBY ORDERED, pursuant to the provisions of Division 7 of the California Water Code, regulations, and plans and policies adopted thereafter, and to the provisions of the Clean Water Act and regulations and guidelines adopted thereafter, that the Department shall comply with the following:

A. GENERAL DISCHARGE PROHIBITIONS

1. Storm water discharges from the Department's Municipal Separate Storm Sewer System (MS4) containing pollutants that have not been reduced to the Maximum Extent Practicable (MEP), are prohibited. The Department shall achieve the pollutant reductions described in this Prohibition through implementation of the provisions in this Order and the approved SWMP.
2. Discharges to Areas of Special Biological Significance (ASBS).
 - a. Existing storm water discharges into an ASBS are allowed only if the discharges:
 - 1) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;
 - 2) Are designed to prevent soil erosion;
 - 3) Occur only during wet weather; and
 - 4) Are composed of only storm water runoff, except as provided at B.6.
 - b. Discharges composed of storm water runoff shall not alter natural water quality in an ASBS.
 - c. The discharge of trash is prohibited.
 - d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no

² Although the cost of compliance with TMDL waste load allocations was considered, compliance with TMDLs is not subject to the MEP standard.

additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

- e. The discharges comply with all terms, prohibitions, and special conditions contained in sections E.2.c.2)a)i) and E.5. of this Order.
3. Discharge of material other than storm water, or discharge that is not composed entirely of storm water, to waters of the United States or another permitted MS4 is prohibited, except as conditionally exempted under Section B.2 of this Order or authorized by a separate National Pollutant Discharge Elimination System (NPDES) permit.
4. The discharge of storm water or conditionally exempt non-storm water that causes or contributes to the violation of water quality standards or water quality objectives (collectively WQSs), the California Toxics Rule (CTR), or impairs the beneficial uses established in a Water Quality Control Plan, or a promulgated policy of the State or Regional Water Boards, is prohibited. The Department shall comply with all discharge prohibitions contained in Regional Water Board Basin Plans.
5. The discharge of storm water to surface waters of the United States in a manner causing or threatening to cause a condition of pollution or nuisance as defined in Water Code section 13050 is prohibited.
6. Discharge of wastes or wastewater from road-sweeping vehicles or from other maintenance activities to any waters of the United States or to any storm drain leading to waters of the United States is prohibited unless in compliance with section E.2.h.3)c)ii) of this Order or authorized by another NPDES permit.
7. The dumping, deposition, or discharge of waste by the Department directly into waters of the United States or adjacent to such waters in any manner that may allow its being transported into the waters is prohibited unless authorized by the Regional Water Board.
8. The discharge of sand, silt, clay, or other earthen materials from any activity in quantities which cause deleterious bottom deposits, turbidity, or discoloration in waters of the United States or which unreasonably affect or threaten to affect beneficial uses of such waters, is prohibited.

B. NON-STORM WATER DISCHARGE PROHIBITIONS

Non-storm water discharges, other than those to ASBS, must comply with the following provisions:

1. The Department shall effectively prohibit non-storm water discharges into its storm water conveyance system unless such discharges are either:
 - a. Authorized by a separate NPDES permit; or
 - b. Conditionally exempt in accordance with provision B.2. of this NPDES permit
2. Conditionally Exempt Non-storm Water Discharges.

The following non-storm water discharges are conditionally exempt from Prohibition B.1 unless the Department or the State Water Board Executive Director identifies them as sources of pollutants to receiving waters. For discharges identified as sources of pollutants, the Department shall either eliminate the discharge or otherwise effectively prohibit the discharge.

- a. Diverted stream flows;
 - b. Rising ground waters;
 - c. Uncontaminated ground water infiltration (as defined at 40 C.F.R., § 35.2005(20)) to MS4s;
 - d. Uncontaminated pumped ground water;
 - e. Foundation drains, including slope lateral drains;
 - f. Springs;
 - g. Water from crawl space pumps;
 - h. Footing drains;
 - i. Air conditioning condensation;
 - j. Flows from riparian habitats and wetlands;
 - k. Water line flushing³;
 - l. Minor, incidental discharges of landscape irrigation water⁴;
 - m. Discharges from potable water sources³;
 - n. Irrigation water⁵;
 - o. Minor incidental discharges from lawn watering;
 - p. Individual residential car washing; and
 - q. Dechlorinated swimming pool discharges.
3. Some Regional Water Boards have separate dewatering and/or “de minimus” NPDES discharge permits or Basin Plan requirements for some or all of these listed non-storm water discharges. The Department shall check with the appropriate Regional Water Board to determine if a specific non-storm water discharge requires coverage under a separate NPDES permit.
 4. The Department is not required to prohibit emergency fire fighting flows (i.e., flows necessary for the protection of life or property). Discharges associated with emergency

³ In order to remain conditionally exempt, discharges shall be dechlorinated prior to discharge.

⁴ In order to remain conditionally exempt, landscape irrigation systems must be designed, operated and maintained to control non-incidental runoff. See definition of incidental runoff in Attachment VIII.

⁵ Return flows from irrigated agriculture are not point-source discharges and are not prohibited from entering the Department’s MS4.

firefighting do not require BMPs, but they are recommended if feasible. As part of the SWMP, the Department shall develop and implement a program to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) as specified in the SWMP.

5. If the State Water Board Executive Director determines that any category of conditionally exempt non-storm water discharge is a source of pollutants, the State Water Board Executive Director may require the Department to conduct additional monitoring and submit a report on the discharges. The State Water Board Executive Director may also order the Department to cease a non-storm water discharge if it is found to be a source of pollutants.

Non-storm water discharges to ASBS must comply with the following provisions:

6. Non-storm water discharges to ASBS are prohibited except as stated in this Section.

The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

- a. Discharges associated with emergency fire fighting operations.
- a. Foundation and footing drains.
- b. Water from crawl space or basement pumps.
- c. Hillside dewatering.
- d. Naturally occurring groundwater seepage via a storm drain.
- f. Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

Discharges from utility vaults and underground structures to a segment of the Department's MS4 with a direct discharge to an ASBS are permitted if such discharges are authorized by the General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surface Water, NPDES No. CAG 990002. A Regional Water Board may nonetheless prohibit a specific discharge from a utility vault or underground structure if it determines that the discharge is causing the MS4 discharge to the ASBS to alter natural ocean water quality in the ASBS.

Additional non-storm water discharges to a segment of the Department's MS4 with a direct discharge to an ASBS are allowed only to the extent the relevant Regional Water Board finds that the discharge does not alter natural ocean water quality in the ASBS.

Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan or alter natural ocean water quality in an ASBS.

C. EFFLUENT LIMITATIONS

The Department shall reduce the discharge of pollutants from its MS4 to waters of the United States to the MEP, as necessary to achieve TMDL WLAs established for discharges by the Department, and to comply with the Special Protections for discharges to ASBS.

D. RECEIVING WATER LIMITATIONS

1. Receiving water quality objectives, as specified in the Water Quality Control Plans and promulgated policies and regulations of the State and Regional Water Boards, are applicable to discharges from the Department's facilities and properties.
2. The discharge of storm water from a facility or activity shall not cause or contribute to an exceedance of any applicable water quality standard.
3. Storm water discharges shall not cause the following conditions to create a condition of nuisance or to adversely affect beneficial uses of waters of the United States:
 - a. Floating or suspended solids, deposited macroscopic particulate matter, or foam;
 - b. Bottom deposits or aquatic growth;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin, and/or;
 - e. Toxic or deleterious substances present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
4. The Department shall comply with Sections A.4, D.2 and D.3 of this Order through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the SWMP and other requirements of this Order including any modifications. The SWMP shall be designed to achieve compliance with Sections A.4, D.2 and D.3 of this Order. If exceedance(s) of WQS persist notwithstanding implementation of the SWMP and other requirements of this Order, the Department shall assure compliance with Sections A.4, D.2 and D.3 of this Order by complying with the procedure specified at Section E.2.c.6)c) of this Order.
5. Provided the Department has complied with the procedure set forth in provision E.2.c.6)c) of this Order and is implementing the revised SWMP required by provision E.1., the Department is not required to repeat the procedure called for in provision E.2.c.6)c) for continuing or recurring exceedances of the same receiving water limitations unless directed by the State Water Board's Executive Director or Regional Water Board Executive Officer to develop additional BMPs.

6. Where the Department discharges waste to a water of the State that is not a water of the United States, compliance with the prohibitions, limitations, and provisions of this Order when followed for that water of the State will constitute compliance with the requirements of the Porter-Cologne Water Quality Control Act, unless the Department is notified otherwise in writing by the State Water Board Executive Director or a Regional Water Board Executive Officer.

E. PROVISIONS

1. Storm Water Management Plan (SWMP)

- a. The Department shall update, maintain and implement an effective SWMP that describes how the Department will meet requirements of this Order as outlined in E.1.b below. The Department shall submit for Executive Director approval an updated SWMP consistent with the provisions and requirements of this Order within one year of the effective date of this Order. The SWMP shall identify and describe the BMPs that shall be used. The SWMP shall be reviewed annually and modified as necessary to maintain an effective program in accordance with the procedures of this Order. The SWMP shall reflect the principles that storm water management is to be a year-round proactive program to eliminate or control pollutants at their source or to reduce them from the discharge by either structural or nonstructural means when elimination at the source is not possible.
- b. The SWMP shall contain the following elements:
 - 1) Overview
 - 2) Management And Organization
 - 3) Monitoring And Discharge Characterization Program
 - 4) Project Planning And Design
 - 5) BMP Development and Implementation
 - 6) Construction
 - 7) Compliance with the Industrial General Permit
 - 8) Maintenance Program Activities, including facilities operations
 - 9) Non-Departmental Activities
 - 10) Non-Storm Water Activities/ Discharges
 - 11) Training
 - 12) Public Education and Outreach
 - 13) Region Specific Activities (See provision E.6 and Attachment V.)
 - 14) Program Evaluation
 - 15) Measurable Objectives
 - 16) Reporting
 - 17) References

The Department shall implement all requirements of this Order regardless of whether those requirements are addressed by an element of the SWMP.

- c. The SWMP shall include all provisions and commitments in the 2003 SWMP (Department, 2003c), as revised in response to U.S. EPA's Findings of Violation and Order for Compliance (U.S. EPA Docket No. C.W.A.-09-2011-0001). The Department shall continue to implement the 2003 SWMP to the extent that it does not conflict with the requirements of this Order and until a new SWMP is approved pursuant to this Order.
- d. All policies, guidelines, and manuals referenced by the SWMP and related to storm water are intended to facilitate implementation of the SWMP, and shall be consistent with the requirements of this Order.
- e. The SWMP shall define terms in a manner that is consistent with the definitions in 40 Code of Federal Regulations section 122.2. This includes, but is not limited to, the definitions for pollutant, waters of the United States, and point source. Where there is a conflict between the SWMP and the language of this Order, the language of this Order shall govern.
- f. Unless otherwise specified in this Order, proposed revisions to the SWMP shall be submitted to the State Water Board Executive Director as part of the Annual Report. The Department shall revise all other appropriate manuals to reflect modifications to the SWMP.
- g. Revisions to the SWMP requiring Executive Director approval will be publicly noticed for thirty days on the State Water Board's website and via the storm water electronic notification list. During the public notice period, members of the public may submit written comments or request a public hearing. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised at the hearing. Upon review of the request or requests for a public hearing, the Executive Director may, in his or her discretion, schedule a public hearing prior to approval of the SWMP revision. The Executive Director shall schedule a hearing if there is a significant degree of public interest in the proposed revision. If no public hearing is conducted, the Executive Director shall consider all public comments received and may approve the SWMP revision if it meets the conditions set forth in this Order. Any SWMP revision approved by the Executive Director will be posted on the State Water Board's website.
- h. The Department shall maintain for public access on its website the latest approved version of the SWMP. The Department shall update the SWMP on its website within 30 days of approval of revisions by the State Water Board.

2. Storm Water Program Implementation Requirements

a. Overview

The Department shall provide an overview of the storm water program in the SWMP. The overview will include:

- 1) A statement of the SWMP purpose;
- 2) A description of the regulatory background;
- 3) A description of the SWMP applicability;
- 4) A description of the relationship of the Permit, SWMP, and related Department documents; and
- 5) A description of the permits addressed by the SWMP.

b. Management and Organization

The Department shall provide in the SWMP an overview of its management and organizational structure, roles and responsibilities of storm water personnel, a description of the role and focal point of the Department's storm water program, and a description of the Storm Water Advisory Teams. The Department shall implement the program specified in the SWMP. The Department shall also implement any additional requirements contained in this Order.

1) *Coordination with Local Municipalities*

- a) The Department is expected to comply with the lawful requirements of municipalities and other local, regional, and/or other State agencies regarding discharges of storm water to separate storm sewer systems or other watercourses under the agencies' jurisdictions.
- b) The Department shall include a **MUNICIPAL COORDINATION PLAN** in the SWMP. The plan shall describe the specific steps that the Department will take in establishing communication, coordination, cooperation, and collaboration with other MS4 storm water management agencies and their programs including establishing agreements with municipalities, flood control departments, or districts as necessary or appropriate. The Department shall report on the status and progress of interagency coordination activities in each Annual Report.

2) *Legal Authority*

- a) The Department shall establish, maintain, and certify that it has adequate legal authority through statute, permit, contract or other means to control discharges to and from the Department's properties, facilities and activities.
- b) The Department has provided a statement certified by its chief legal counsel that the Department has adequate legal authority to implement and enforce

each of the key regulatory requirements contained in 40 Code of Federal Regulations sections 122.26(d)(2)(i)(A-F). The Department shall submit annually, as part of the Annual Report, a **CERTIFICATION OF THE ADEQUACY OF LEGAL AUTHORITY**.

3) *Fiscal Resources*

- a) The Department shall seek to maintain adequate fiscal resources to comply with this NPDES Permit. This includes but is not limited to:
 - i) Implementing and maintaining all BMPs;
 - ii) Implementing an effective storm water monitoring program; and
 - iii) Retaining qualified personnel to manage the storm water program.
- b) The Department shall submit a **FISCAL ANALYSIS** of the storm water program annually. At a minimum, the fiscal analysis shall show:
 - i) The allocation of funds to the Districts for compliance with this Order;
 - ii) The funding for each program element;
 - iii) A comparison of actual past year expenditures with the current year's expenditures and next year's proposed expenditures;
 - iv) How the funding has met the goals specified in the SWMP and District workplans; and
 - v) Description of any cost sharing agreements with other responsible parties in implementing the storm water management program.
- c) The fourth year report shall contain a **BUDGET ANALYSIS** for the next permit cycle.

4) *Practices and Policies*

The Department shall identify in the SWMP any of the Department's practices and policies that conflict with implementation of the storm water program. The Department shall annually propose changes, including changes to implementation schedules, needed to resolve these conflicts and otherwise effectively implement the SWMP and the requirements of this Order.

5) *Inspection Program*

The Department shall have an inspection program to ensure that this Order and the SWMP are implemented, and that facilities are constructed, operated, and maintained in accordance with this Order and the SWMP. The program shall include training for inspection personnel, documentation of field activities, a reporting system that can be used to track effectiveness of control measures, enforcement procedures (or referral for enforcement) for non-compliance, procedures for taking corrective action, and responsibilities and responsible personnel of all affected functional offices and branches.

The inspection program shall also include standard operating procedures for documenting inspection findings, a system of escalating enforcement response to non-compliance (including procedures for addressing third party (i.e., contractor) non-compliance), and a system to ensure the timely resolution of all violations of this Order or the SWMP. The Department shall delegate adequate authority to appropriate personnel within all affected functional offices and branches to require corrective actions (including stop work orders).

6) *Incident Reporting - Non-Compliance and Potential/Threatened Non-Compliance*

The Department shall report all known incidents of non-compliance with this Order. Non-compliance may be emergency, field, or administrative. The Department shall electronically file a complete **INCIDENT REPORT FORM** (Attachment I) in the Storm Water Multiple Application Report and Tracking System (SMARTS)⁶ and provide verbal notifications as soon as practicable, but no later than the time frames specified in Attachment I. Submission of an Incident Report Form is not an admission by the Department of a violation of this Order. The types of incidents requiring non-compliance reporting are discussed in Attachment I. The State Water Board or Regional Water Board may require additional information. The Department shall include in the Annual Report a summary of all incidents by type and District, and report on the status of each.

The Department shall report all potential or threatened non-compliance to the State Water Board and appropriate Regional Water Board in accordance with the “Anticipated non-compliance” provisions described in Attachment VI (Standard Provisions). The report shall describe the timing, nature and extent of the anticipated non-compliance. An Incident Report Form is not required for anticipated non-compliance. Anticipated non-compliance may be for field or administrative incidents only.

c. Monitoring and Discharge Characterization Requirements

The Department shall revise and implement the SWMP consistent with the requirements specified below.

1) *Monitoring Site Selection*

Monitoring shall be conducted in two tiers. Tier 1 consists of all sites for which monitoring is required pursuant to the requirements of the General Exception, including Special Protections, to the California Ocean Plan waste discharge prohibitions for storm water and non-point source discharges to ASBS, and sites in impaired watersheds for which the Department has been assigned a WLA and monitoring requirements pursuant to an approved TMDL. Tier 2 consists of all sites where the Department has existing monitoring data, including both storm water and non-storm water. Tier 2 sites may include locations where the Department has conducted characterization monitoring or where monitoring has been conducted for other purposes.

⁶ <https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp>

The Department shall conduct without limitation all Tier 1 monitoring as required under the ASBS Special Protections and under the adopted and approved TMDLs. The Department may satisfy Tier 1 monitoring requirements by participating in stakeholder groups. Retrofitting and verification monitoring under Tier 2 need not be initiated until there are less than 100 sites actively monitored under Tier 1. There shall be a minimum of 100 active monitoring sites at any one time, consisting of Tier 1, Tiers 1 and 2, or Tier 2.

Sites from Tier 2 shall be prioritized by the Department in consideration of the threat to water quality, including the pollutant and its concentration or load, the distance to receiving water, water quality objectives, and any existing impairments in the receiving waters. The prioritized list shall be submitted to the State Water Board within eight (8) months of the effective date of this Order. The State Water Board will review the prioritized list and may revise it to reflect Regional or State Water Board priorities. The revised list will be approved by the Executive Director and will become effective upon notice to the Department.

2) *Water Quality Monitoring*

a) Tier 1 Monitoring Requirements

i) Areas of Special Biological Significance

The Department's ASBS monitoring program shall include both core discharge monitoring and ocean receiving water and reference site monitoring. The State and Regional Water Boards must approve receiving water and reference site sampling locations and any adjustments to the monitoring program. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions exist.

(1) Core Discharge Monitoring Program

Core discharge monitoring is the monitoring of storm water effluents from the storm water outfalls at the priority discharge locations listed in Attachment III.

(a) General Sampling Requirements for Timing and Storm Size

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for

the same constituents as receiving water and reference site samples (see section E.2.c.2)a)i)(2)) as described below.

(b) Runoff Flow Measurements

For storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width, including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State Water Board. Report measurements annually for each precipitation season to the State and Regional Water Boards.

(c) Runoff samples – storm events

- (i) Outfalls equal to or greater than 18 inches (0.46m) in diameter or width.

Samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination. Samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS. If the Department has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B (shown in Attachment II) metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

- (ii) Outfalls equal to or greater than 36 inches (0.91m) in diameter or width.

Samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination. Samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and

phosphates). Samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(d) If the Department does not participate in a regional monitoring program as described in provision E.2.c.2)a)i)(2)(b) in addition to (i) and (ii) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A (shown in Attachment II) constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For discharges to ASBS in more than one Regional Water Board, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

(e) The Executive Director of the State Water Board may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

(2) Ocean Receiving Water and Reference Area Monitoring Program
In addition to performing the Core Discharge Monitoring Program in provision E.2.c.2)a)i)(1) above, the Department must perform ocean receiving water monitoring. The Department may either implement an individual monitoring program or participate in a regional integrated monitoring program.

(a) Individual Monitoring Program

If the Department elects to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS, in addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

(i) Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in provision E.2.c.2)a)i)(1)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan

PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

- (ii) Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.
- (iii) A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.
- (iv) Once during each permit term and in each subsequent five year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the

State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

(v) Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

(vi) The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

(b) Regional Integrated Monitoring Program

The Department may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within an ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the prescribed individual monitoring approach described in provision E.2.c.2)a)i)(2)(a) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

(i) Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are

303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled by the Department. Because the Department discharges to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

- (ii) ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than 18 inches). Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS by the Department. At a minimum, one reference station and one receiving water station shall be sampled in each applicable Regional Water Board.
- (iii) Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons.

- (iv) Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.
- (v) Determinations of compliance with Special Protections requirements for ASBS discharges (State Water Board resolution DWQ 2012-0012) shall be made by the Executive Director of the State Water Board or his designee. When a determination is made that a site or discharge is in compliance with the Special Protections, the site will no longer be considered an active monitoring site pursuant to provision E.2.c.1). This provision applies regardless of any continued monitoring that may be required at the site pursuant to the Special Protections.

ii) Total Maximum Daily Load Watersheds

The Department shall comply with the TMDL monitoring requirements in Attachment IV, or in orders of the Regional Water Boards pursuant to Water Code section 13383 that require TMDL-related monitoring. TMDL monitoring shall also include the constituents listed in Attachment II, except as exempted in Attachment IV.

Determinations of compliance with the TMDL shall be made by the Executive Officer of the Regional Water Board or his designee. When a determination is made that a site or discharge is in compliance with the TMDL, the site will no longer be considered an active monitoring site pursuant to provision E.2.c.1) and monitoring of Attachment II constituents will be discontinued. This provision applies regardless of any continued monitoring that may be required at the site pursuant to the TMDL.

b) Tier 2 Retrofit and Verification Monitoring Requirements

Corrective actions shall be implemented at the top 15 percent of sites (rounded up) on the Tier 2 priority list, subject to the number of sites per year specified in provision E.2.c.1). Follow up monitoring shall be conducted to confirm the effectiveness of the measures implemented, as determined by the Executive Officer of the Regional Water Board or his designee. Follow up monitoring is not required where the discharge has been eliminated, or where

the implemented BMP provides full retention of the 85th percentile, 24-hour rain event.

Determinations of compliance at the Tier 2 sites shall be made by the Executive Officer of the Regional Water Board or his designee. When a determination is made that a site or discharge is in compliance, the site will no longer be considered an active monitoring site pursuant to provision E.2.c.1).

3) *Corrective Actions*

Corrective actions may include structural or non-structural BMPs. All structural BMPs must be designed according to the requirements in provisions E.2.d. and E.2.e.

4) *Field and Laboratory Data Requirements*

The Department shall prepare, maintain, and implement a Quality Assurance Project Plan (QAPP) in accordance with the Surface Water Ambient Monitoring Program. All monitoring samples shall be collected and analyzed according to the Department's QAPP developed for the purpose of compliance with this Order. SWAMP Quality Assurance Program Plan (2008) is available at:

http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml

All samples shall be analyzed by a certified or accredited laboratory as required by Water Code section 13176. Global Positioning System (GPS) coordinates shall be recorded for all monitoring sites, including sites selected for the final Tier 2 priority list (top 15%) according to existing data.

Water quality data (receiving water and effluent) shall be uploaded to the Storm Water Multi-Application Reporting and Tracking System (SMARTS) and must conform to "CEDEN Minimum Data Templates" format. CEDEN Minimum Data Templates are available at <http://ceden.org/>.

Analytical results shall be filed electronically in SMARTS within 30 days of receipt by the Department.

5) *Monitoring Results Report*

The Department shall submit, separate from the Annual Report, a **MONITORING RESULTS REPORT (MRR)** by October 1 of each year.

- a) The MRR shall include a list of all sites in Tier 1 and Tier 2 being actively monitored, and the results of the past fiscal year's monitoring activities including effluent and receiving water quality monitoring.
- b) The Department shall specifically highlight sample values that exceed applicable WQSs, including toxicity objectives. Complete sample results or

lab data need not be included, but must be retained and filed electronically, and must be provided to the Regional Water Board or State Water Board as provided in provision E.2.c.4).

- c) The MRR shall include a summary of sites requiring corrective actions needed to achieve compliance with this Order, and a review of any iterative procedures (where applicable) at sites needing corrective actions.
- d) The reporting period for the MRR shall be July 1 of the prior year through June 30 of the current year.

6) *Compliance Monitoring and Reporting*

- a) The Department shall review and propose any updates, as needed, to the Non-compliance Reporting Plan for Municipal and Construction Activities in section 9.4.1 of the SWMP. The plan shall identify the staff in each District Office and Regional Water Board to send and receive **INCIDENT REPORT FORMS** (Attachment I). The Department shall continue to implement the July 2008 Construction Compliance Evaluation Plan or any updated plan as approved by the Executive Director.
- b) The Department shall summarize, by District, all non-compliance incidents, including construction, in the Annual Report. The summary shall include incident dates, types, locations, and the status of the non-compliance incidents.
- c) Receiving Water Limitations Compliance.
 - i) Upon a determination by the Department or the Regional Water Board Executive Officer that a discharge is causing or contributing to an exceedance of an applicable WQS, the Department shall provide verbal notification within five (5) days, and within 30 days thereafter submit a report to the appropriate Regional Water Board with a copy to the State Water Board. Verbal notification is not required where the determination is made by the Regional Water Board. An Incident Report is not required. Where the pollutant causing the exceedance is subject to a waste load allocation listed in Attachment IV of this Order, the Department shall comply with the requirements of the relevant TMDL in lieu of this provision.
 - ii) The report shall describe BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance. The report shall include an implementation schedule. The Regional Water Board Executive Officer may require modifications to the report.
 - iii) The Department shall submit any modifications to the report required by the Regional Water Board within 30 days of notification.
 - iv) The Department shall implement the revised BMPs and conduct any additional monitoring required according to the implementation schedule.

- d) Toxicity
 - i) Tests for chronic toxicity, where required, shall be estimated as specified in Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002; Table IA, 40 Code of Federal Regulations section 136 and its subsequent amendments or revisions.
 - ii) For the Department's discharges, the In-stream Waste Concentration (IWC) is 100 percent (i.e., either is 100 percent storm water or 100% non-storm water). To calculate either a Pass or Fail of the effluent concentration chronic toxicity test at the IWC, the instructions in Appendix A in the National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document (EPA/833-R-10-003) shall be used. A Pass result indicates no toxicity at the IWC, and a Fail result indicates toxicity at the IWC. Results shall be reported as provided in provision E.2.c.5).

- e) Toxicity Reduction Evaluations (TREs)
 - i) The Department shall include in the SWMP a TRE workplan (1-2 pages) specifying the steps that will be taken in preparing a TRE, when a TRE is required pursuant to provision E.2.c.6)e)ii). The workplan shall include, at a minimum:
 - (a) A description of the investigation and evaluation techniques that will be used to identify potential causes and sources of toxicity, effluent variability, and BMP efficiencies.
 - (b) A description of the steps that will be taken to identify effective pollutant/toxicity reduction opportunities.
 - (c) If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIEs (i.e., a Department laboratory or outside contractor).
 - ii) Upon a determination that a discharge is causing or contributing to an exceedance of an applicable toxicity standard, a TRE may be required by the appropriate Regional Water Board Executive Officer on a site specific basis. The TRE shall be conducted according to the workplan in the SWMP.

d. Project Planning and Design

The Department shall describe in the SWMP how storm water management is incorporated into the project planning and design process, and how the procedures and methodologies used in the selection of Design and Construction BMPs will be used in Department projects. The Department shall implement the program specified in the SWMP, any documents incorporated into the SWMP by reference, and any additional requirements contained in this Order.

Department and Non-Department projects within the Department's ROW that are new development or redevelopment shall comply with the standard project planning and design requirements for new development and redevelopment specified below. These requirements shall apply to all new and redevelopment projects that have not completed the project initiation phase on the effective date of this Order.

1) *Design Pollution Prevention Best Management Practices*

The following design pollution prevention best management practices shall be incorporated into all projects that create disturbed soil area (DSA), including projects designed to meet the post-construction treatment requirements (Section E.2.d.2)). The SWMP shall be updated to reflect these principles.

- a) Conserve natural areas, to the extent feasible, including existing trees, stream buffer areas, vegetation and soils;
- b) Minimize the impervious footprint of the project;
- c) Minimize disturbances to natural drainages;
- d) Design and construct pervious areas to effectively receive runoff from impervious areas, taking into consideration the pervious areas' soil conditions, slope and other pertinent factors;
- e) Implement landscape and soil-based BMPs such as compost-amended soils and vegetated strips and swales;
- f) Use climate-appropriate landscaping that minimizes irrigation and runoff, promotes surface infiltration, and minimizes the use of pesticides and fertilizers; and
- g) Design all landscapes to comply with the California Department of Water Resources Water Efficient Landscape Ordinance.

<http://www.water.ca.gov/wateruseefficiency/landscapeordinance/technical.cfm>

Where the California Department of Water Resources Water Efficient Landscape Ordinance conflicts with a local water conservation ordinance, the Department shall comply with the local ordinance.

2) *Post-Construction Storm Water Treatment Controls*

a) Projects Subject to Post-Construction Treatment Requirements

i) Department Projects

The Department shall implement post construction treatment control BMPs for the following new development or redevelopment projects:

- (1) Highway Facility projects that create 1 acre or more of new impervious surface.
- (2) Non-Highway Facility projects that create 5,000 square feet or more of new impervious surface.

ii) Non-Department Projects within Department ROW

- (1) The Department shall exercise control or oversight over Non-Department projects through encroachment permits or other means.
- (2) Non-Department development or redevelopment projects shall be subject to the same post-construction treatment control requirements as Department projects.
- (3) For all Non-Department Projects that trigger post-construction treatment control requirements, the Department shall review and approve the design of post-construction treatment controls and BMPs prior to implementation.

iii) Waiver

Where a Regional Water Board Executive Officer finds that a project will have a minimal impact on water quality, the Executive Officer may waive the treatment control requirements, or lessen the stringency of the requirements, for a project. Waivers may not be granted for projects subject to treatment control requirements based on a waste load allocation assigned to the Department.

b) Numeric Sizing Criteria for Storm Water Treatment Control BMPs:

Treatment control BMPs constructed for Department and Non-Department projects shall be designed according to the following priorities (in order of preference):

- i) Infiltrate, harvest and re-use, and/or evapotranspire the storm water runoff;
- ii) Capture and treat the storm water runoff.

The storm water runoff volumes and rates used to size BMPs shall be based on the 85th percentile 24-hour storm event. This sizing criterion shall apply to the entire treatment train within Project Limits. Design Pollution Prevention BMPs can be used to comply with this requirement.

In the event the entire runoff volume from an 85th percentile 24-hour storm event cannot be infiltrated, harvested and re-used, or evapotranspired, the excess volume may be treated by Low Impact Development (LID)-based flow-through treatment devices. Where LID-based flow-through treatment devices are not feasible, the excess volume may be treated through conventional volume-based or flow-based storm water treatment devices.

The Department shall always prioritize the use of landscape and soil-based BMPs to treat storm water runoff. Other BMPs may be used only after landscape and soil-based BMPs are determined to be infeasible. The

Department shall also consider other effective storm water treatment control methods or devices for Department approval.

c) Scope of Design Criteria Applicability for Redevelopment Projects

i) For Highway Facilities:

- (1) Where redevelopment results in an increase in impervious area that is less than or equal to 50 percent of the total post-project impervious area within Project Limits, the numeric sizing criteria shall only apply to the new impervious area and not to the entire project.

If the redeveloped impervious area cannot be hydraulically separated from the existing impervious area, the Department shall either: provide treatment for redeveloped areas and as much of the hydraulically inseparable flow as feasible, based on site conditions and constraints; or identify treatment opportunities equivalent to the redeveloped area (see Alternative Compliance, below).

If it is not possible to separate the flows from redeveloped areas from the existing impervious area, the treatment system shall be designed to treat as much of the hydraulically inseparable flow as feasible, and shall bypass or divert any excess around the treatment device. The purpose of this requirement is to prevent overloading the treatment device and impairing its performance.

- (2) Where redevelopment results in an increase in impervious area that is greater than 50 percent of the total post-project impervious area within Project Limits, the numeric sizing criteria apply to the entire project.

ii) For Non-Highway Facilities, where redevelopment results in an increase in impervious area that is less than or equal to 50 percent of the total post-project impervious area of an existing development, the numeric sizing criteria shall only apply to the new impervious area and not to the entire project.

- (1) If the redeveloped impervious area cannot be hydraulically separated from the existing impervious area, the Department shall either provide treatment for existing and redeveloped areas, or identify treatment opportunities equivalent to the redeveloped area (See Alternative Compliance, below).

- (2) Where redevelopment results in an increase in impervious area that is greater than 50 percent of the total post-project impervious area of an existing development, the numeric sizing criteria apply to the entire project.

d) Alternative Compliance

If the Department determines that all or any portion of on-site treatment for a project is infeasible on-site, the Department shall prepare a proposal for alternative compliance for approval by the Regional Water Board Executive Officer or his designee until such time as a statewide process is approved by the Executive Director of the State Water Board. The proposal shall include documentation supporting the determination of infeasibility. Alternative compliance may be achieved outside Project Limits within the Department's ROW, including within another Department project. Alternative compliance to be achieved outside Project Limits shall include provisions for the long-term maintenance of such treatment facilities.

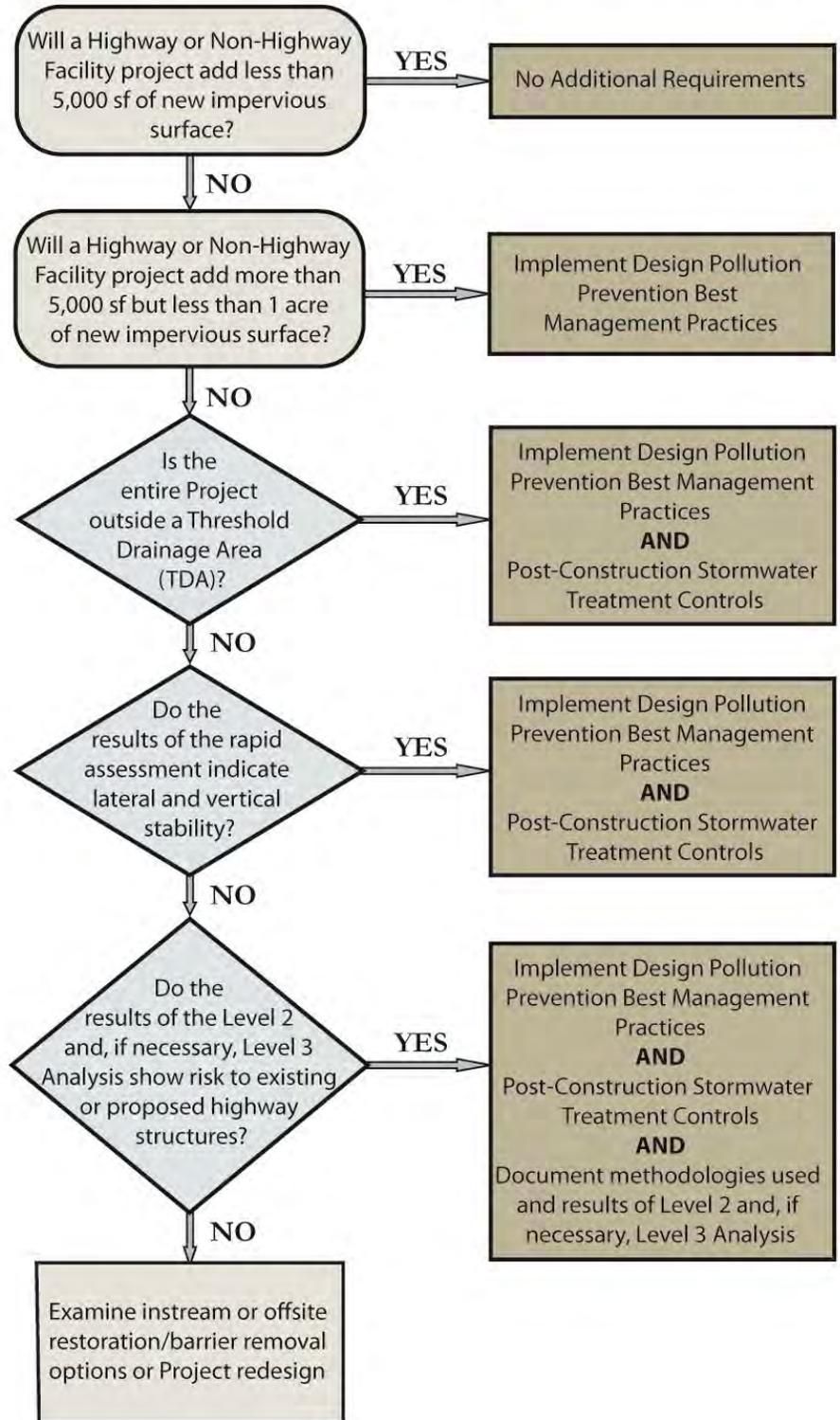
3) *Hydromodification Requirements*

The Department shall ensure that all new development and redevelopment projects do not cause a decrease in lateral (bank) and vertical (channel bed) stability in receiving stream channels. Unstable stream channels negatively impact water quality by yielding much greater quantities of sediment than stable channels. The Department shall employ the risk-based approach detailed in this permit to assess lateral and vertical stability. The approach assists the Department in assessing pre-project channel stability and implementing mitigation measures that are appropriate to protect structures and minimize stream channel bank and bed erosion. The approach is depicted in Figure 1 and described below.

- a) Highway or Non-Highway Facility projects that add between 5,000 square feet and 1 acre of new impervious surface must implement the Design Pollution Prevention Best Management Practices in Section E.2.d.1).
- b) Highway or Non-Highway Facility projects that add 1 acre or more of new impervious surface completely outside of a Threshold Drainage Area⁷ must implement the Design Pollution Prevention Best Management Practices and the Post-Construction Storm Water Treatment Controls in Section E.2.d.

⁷ Threshold Drainage Area is defined as the area draining to a location at least 20 channel widths downstream of a stream crossing (pipe, swale, culvert, or bridge) within Project Limits. Delineating the Threshold Drainage Area is not necessary if there is/ are no stream crossing(s) within the Project Limits.

FIGURE 1: Hydromodification Flowchart



- c) Highway or Non-Highway Facility projects that add 1 acre or more of new impervious surface with any impervious portion of the project located within a Threshold Drainage Area must conduct a rapid assessment of stream stability⁸ at each stream crossing (e.g., pipe, culvert, swale or bridge) within that Threshold Drainage Area. If the stream crossing is a bridge, a follow up rapid assessment of stream stability is also required and can be coordinated with the federally-mandated bridge inspection process. The assessment will be conducted within a representative channel reach to assess lateral and vertical stability. A representative reach is a length of stream channel that extends at least 20 channel widths upstream and downstream of a stream crossing. For example, a 20 foot-wide channel would require analyzing a 400 foot distance upstream and downstream of the discharge point or bridge. If sections of the channel within the 20 channel width distance are immediately upstream or downstream of steps, culverts, grade controls, tributary junctions, or other features and structures that significantly affect the shape and behavior of the channel, more than 20 channel widths should be analyzed.
- d) If the results of the rapid assessment indicate that the representative reach is laterally and vertically stable (i.e., a rating of excellent or good) the Department does not have to conduct further analyses and must implement the Design Pollution Prevention Best Management Practices and the Post-Construction Storm Water Treatment Controls in Section E.2.d.
- e) If the results of the rapid assessment indicate that the representative reach will not be laterally and vertically stable (i.e., a rating of excellent or good), the Department must determine whether the instability, in conjunction with the proposed project, poses a risk to existing or proposed highway structures by conducting appropriate Level 2 (and, if necessary, Level 3) analyses. The Department shall follow the Level 2 and 3 analysis guidelines contained in HEC-20 (FHWA, 2001) or a suitable equivalent within an accessible portion of the reach. If the results of the appropriate Level 2 (and, if necessary Level 3) analyses indicate that there is no risk to existing or proposed highway structures, the Department must implement the Design Pollution Prevention Best Management Practices and the Post-Construction Storm Water Treatment Controls in Section E.2.d. and document the methodologies used, the results, and the mitigation measures suggested as part of the appropriate Level 2 and, if necessary, Level 3 analyses.
- f) If the results of the Level 2 and 3 analysis indicate that the instability, in conjunction with the proposed project, poses a risk to existing or proposed highway structures, other options must be implemented, including, but not limited to, in-stream and floodplain enhancement/restoration, fish barrier

⁸ Guidance and worksheets used for the rapid assessment of stream stability are in the Federal Highway Administration publication "Assessing Stream Channel Stability at Bridges in Physiographic Regions" (FHWA, 2006).

removal as identified in the report required under Article 3.5 of the Streets and Highways Code (see below), regional flow control, off-site BMPs, and, if necessary, project re-design.

- 4) *Stream Crossing Design Guidelines to Maintain Natural Stream Processes*
The Department shall review and revise as necessary the guidance document “Fish Passage Design for Road Crossings” (Department, 2009). In reviewing and revising the guidance document, the Department shall be consistent with the latest stream crossing design, construction, and rehabilitation criteria contained in the California Salmonid Stream Habitat Restoration Manual (California Department of Fish & Game, 2010) and National Marine Fisheries Service guidance (NMFS, 2001). The review shall be completed no later than one year after the effective date of this Order. The Department shall submit in the Year 2 Annual Report a report detailing the review of the guidance document. The Year 2 Annual Report shall also report on the implementation of the road crossing guidelines.

If it is infeasible to meet any of the guidelines specified above, the Department shall prepare written documentation justifying the determination of infeasibility. Documentation shall be provided to the Regional Water Board for approval.

The Department shall submit to the State Water Board by October 1 of each year the same report required under Article 3.5 of the Streets and Highways Code requiring the Department to report on the status of its efforts in locating, assessing, and remediating barriers to fish passage.

e. BMP Development & Implementation

In the SWMP, the Department shall include a description of how BMPs will be developed, constructed and maintained. The Department shall continue to evaluate and investigate new BMPs through pilot studies. The Department shall submit updates to the **STORM WATER TREATMENT BMP TECHNOLOGY REPORT** and the **STORM WATER MONITORING AND BMP DEVELOPMENT STATUS REPORT** in the Annual Report.

1) *Vector Control*

- a) All storm water BMPs that retain storm water shall be designed, operated and maintained to minimize mosquito production, and to drain within 96 hours of the end of a rain event, unless designed to control vectors. BMPs shall be maintained at the frequency specified by the manufacturer. This limitation does not apply in the Lake Tahoe Basin and in other high-elevation regions of the Sierra Nevada above 5000 feet elevation with similar alpine climates. The Department shall operate and maintain all BMPs to prevent the propagation of vectors, including complying with applicable provisions of the California Health and Safety Code relating to vector control.

- b) The Department shall cooperate and coordinate with the California Department of Public Health (CDPH) and with local mosquito and vector control agencies on issues related to vector production in the Department's structural BMPs. The Department shall prepare and maintain an inventory of structural BMPs that retain water for more than 96 hours. The inventory need not include BMPs in the Lake Tahoe Basin or other regions of the Sierra Nevada above 5000 feet. The inventory shall be provided to CDPH in electronic format for distribution to local mosquito and vector control agencies. The inventory shall be provided in Year 2 of the permit and updated every two years.

2) *Storm Water Treatment BMPs*

- a) The Department shall inspect all newly installed storm water treatment BMPs within 45 days of installation to ensure they have been installed and constructed in accordance with approved plans. If approved plans have not been followed, the Department shall take appropriate remedial actions to bring the BMP or control into conformance with its approved design.
- b) The Department shall inspect all installed storm water treatment BMPs at least once every year, beginning one year after the effective date of this Order.
- c) The Department may drain storm water treatment BMPs to the MS4 if the discharge does not cause or contribute to exceedances of water quality standards. Retained sediments shall be disposed of properly, in compliance with all applicable local, State, and federal acts, laws, regulations, ordinances, and statutes.
- d) The Department shall develop and utilize a watershed-based database to track and inventory treatment BMPs and treatment BMP maintenance within its jurisdiction. At a minimum, the database shall include:
 - i) Name and location of BMP;
 - ii) Watershed, Regional Water Board and District where project is located;
 - iii) Size and capacity;
 - iv) Treatment BMP type and description;
 - v) Date of installation;
 - vi) Maintenance certifications or verifications;
 - vii) Inspection dates and findings;
 - viii) Compliance status;
 - ix) Corrective actions, if any; and
 - x) Follow-up inspections to ensure compliance.

Electronic reports for each BMP inspected during the reporting period shall be submitted to each associated Regional Water Board in tabular form. A summary of the tracking system data shall be included in the Annual Report along with a report on maintenance activities for post construction BMPs.

The tracking system database shall be made available to the State Water Board or any Regional Water Board upon request.

3) BMPs shall not constitute a hazard to wildlife.

4) *Biodegradable Materials.*

The Department shall utilize wildlife-friendly 100% biodegradable⁹ erosion control products wherever feasible. At any site where erosion control products containing non-biodegradable materials have been used for temporary site stabilization, the Department shall remove such materials when they are no longer needed. If the Department finds that erosion control netting or products have entrapped or harmed wildlife at any site or facility, the Department shall remove the netting or product and replace it with wildlife-friendly biodegradable products.

f. Construction

1) *Compliance with the Statewide Construction Storm Water General Permit (CGP) and Lake Tahoe Construction General Permit (TCGP)*

Construction activities that may receive coverage under the CGP or the TCGP are not covered under this MS4 Permit. The Department shall electronically file Permit Registration Documents (PRD) for coverage under the CGP or TCGP for all projects subject to the CGP or TCGP.

2) *Construction Activities not Requiring Coverage Under the CGP*

For construction activities that are not subject to the CGP or the TCGP, the Department shall implement BMPs to reduce the discharge of pollutants to the MEP in storm water discharges associated with land disturbance activities including clearing, grading and excavation activities that result in the disturbance of less than one acre of total land area. The Department shall also implement BMPs to reduce the discharge of pollutants to the MEP for construction and maintenance activities that do not involve land disturbance such as roadway and parking lot repaving and resurfacing. The Department must comply with any region-specific waste discharge requirements, including any requirements applicable to activities involving less than one acre land disturbance.

3) *Construction Projects Involving Lead Contaminated Soils*

The Department has applied for and received variances from the California Department of Toxic Substances Control (DTSC) for the reuse of some soils that contain lead. For construction projects that have received a DTSC variance, the Department shall notify the appropriate Regional Water Board in writing 30 days prior to advertisement for bids to allow a determination by the Regional Water Board of the need for development of Waste Discharge Requirements (WDRs).

⁹ For purposes of this Order, photodegradable synthetic products are not considered biodegradable.

4) *Pavement Grindings*

The Department shall comply with the requirements of the Regional Water Boards for the management of pavement grindings as well as with all local and State regulations, including Titles 22 and 27 of the California Code of Regulations.

5) *Contractor Compliance*

The Department shall require its contractors to comply with this Order and with all applicable requirements of the CGP.

6) *Construction Non-Compliance Reporting*

Incidents of non-compliance with the CGP shall be reported pursuant to the provisions of the CGP. The Department shall provide in the Annual Report a summary of all construction project non-compliance (Section E.2.c.6b)).

g. Compliance with Statewide Industrial Storm Water General Permit (IGP)

Industrial activities are not covered under this MS4 permit. The Department shall electronically file PRDs for coverage under the IGP for all facilities subject to coverage under the IGP. The categories of industrial facilities are provided in Attachment 1 of the Industrial General Permit (NPDES Permit No. CAS000001; the current Order No. 97-03-DWQ). The Department shall require its industrial facility contractors to comply with all requirements of the IGP. The discharge of pollutants from facilities not covered by the Industrial General Permit will be reduced to the MEP through the appropriate implementation of BMPs.

h. Maintenance Program Activities and Facilities Operations

1) *Implement SWMP Requirements*

The Department shall implement the program specified in the SWMP to reduce or eliminate pollutants in storm water discharges from Department maintenance facilities and maintenance activities. The Department shall also implement any additional requirements contained in this Order.

2) A **FACILITY POLLUTION PREVENTION PLAN (FPPP)** describes the activities conducted at a facility and the BMPs to be implemented to reduce or eliminate the discharge of pollutants in storm water runoff from the facility.

The Department shall prepare, revise and/or update the FPPPs for all maintenance facilities by October 1 of the first year. Each facility shall be evaluated separately and assigned appropriate site specific BMPs. The FPPP shall describe the activities conducted at the facility and the BMPs to be implemented to reduce or eliminate the discharge of pollutants in storm water runoff from the facility. The FPPP shall describe the inspection program used to ensure that maintenance BMPs are implemented and maintained. The Department shall identify in each Annual Report the status of the FPPP for each

Maintenance Facility by District and Region, including the date of the last update or revision and the nature of any revisions.

The Department shall evaluate all non-maintenance Facilities, excluding leased properties, for water quality problems. If the Department identifies a water quality problem at a non-maintenance facility, it shall prepare an FPPP for that facility. If Regional Water Board staff determines that a non-maintenance facility may discharge pollutants to the storm water drainage system or directly to surface waters, the Department shall prepare an FPPP for that facility.

Regional Water Board staff has the authority to require the submittal of an FPPP at any time, to require changes to a FPPP, and to require changes in the implementation of the provisions of a FPPP.

3) *Highway Maintenance Activities*

a) The Department shall develop and implement runoff management programs and systems for existing roads, highways, and bridges to reduce runoff pollutant concentrations and volumes entering surface waters. The Department shall:

- i) Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures). Priority shall be given to sites in sensitive watersheds or where there is an existing or potential threat to water quality;
- ii) Establish schedules for implementing appropriate controls; and
- iii) Identify road segments with slopes that are prone to erosion and sediment discharge and stabilize these slopes to control the discharge of pollutants to the MEP. An inventory of vulnerable road segments shall be maintained in the District Work Plans. Stabilization activities shall be reported in the Annual Report. This section does not apply to landslides and other forms of mass wasting which are covered under section E.2.h.3)d).

b) *Vegetation Control*

The Department shall control its handling and application of chemicals including pesticides, herbicides, and fertilizers to reduce or eliminate the discharge of pollutants to the MEP. The Department shall incorporate integrated pest management and integrated vegetation management practices into its vegetation control program¹⁰. At a minimum, the Department shall:

- i) Apply herbicides and pesticides in compliance with federal, state and local use regulations and product label directions.

¹⁰ <http://www.epa.gov/opp00001/factsheets/ipm.htm> and <http://www.ipm.ucdavis.edu/>

- (1) Violations of regulations shall be reported to the County Agricultural Commissioners within 10 business days.
 - (2) The Annual Report shall include a summary of violations and follow-up actions to correct them.
- ii) Minimize the application of chemicals by using integrated pest management and integrated vegetation management. For example, the Department may reduce the need for application of fertilizers and herbicides by using native species and using mechanical and biological methods for control of exotic species.
 - iii) Prior to chemical applications, assess site-specific and application-specific conditions to prevent discharge. The assessment shall include the following variables:
 - (1) Expected precipitation events, especially those with the potential for high intensity;
 - (2) Proximity to water bodies;
 - (3) Intrinsic mobility of the chemical;
 - (4) Application method, including any tendency for aerial dispersion;
 - (5) Fate and transport of the chemical after application;
 - (6) Effects of using combinations of chemicals; and
 - (7) Other conditions as identified by the applicator.
 - iv) Apply nutrients at rates and by means necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.
 - v) Ensure that all employees or contractors who, within the scope of their duties, prescribe or apply herbicides, pesticides, or fertilizers (including over-the-counter products) are appropriately trained and licensed to comply with these provisions.
 - vi) Propose SWMP provisions as appropriate.
 - vii) Include the following items in the Annual Report:
 - (1) A summary of the Department's chemical use. Report the quantity of chemicals used during the previous reporting period by name and type of chemical, by District, and by month.
 - (2) An assessment of long-term trends in herbicide usage. Include a table presenting yearly District herbicide totals by chemical type;
 - (3) A comparison of the statewide herbicide use with the Department's herbicide reduction goals;

- (4) An analysis of the effectiveness of implementation of vegetation control BMPs. Improvements to BMP implementation either being used or proposed for usage shall be discussed. If no improvements are proposed, explain why;
- (5) Justification for any increases in use of herbicides, pesticides, and fertilizers;
- (6) A report on the number and percentage of employees who apply pesticides and have been trained and licensed in the Department's Pesticide and Fertilizer Pollution Control Program policies; and
- (7) Training materials, if requested by the State Water Board.

c) Storm Water Drainage System Facilities Maintenance

- i) The Department shall inspect all urban¹¹ drainage inlets and catch basins a minimum of once per year and shall remove all waste and debris from drainage inlets and catch basins when waste and debris have accumulated to a depth of 50 percent of the inlet or catch basin capacity.
- ii) Waste and debris, including sweeper and vacuum truck waste, shall be managed and reported in accordance with all applicable laws and regulations, including the Cal. Code Regs. Title 27, Division 2, Subdivision 1.
- iii) The Department shall develop a **WASTE MANAGEMENT PLAN** that includes a comprehensive inventory of waste storage, transfer, and disposal sites; the source(s) of waste and the physical and chemical characterization of the waste retained at each site; estimated annual volumes of material and existing or planned waste management practices for each waste and facility type. Waste characterization need not be conducted on a site-by-site basis but may be evaluated programmatically based upon the highway environment and associated land uses contributing to the sites, climate, and ecoregion. The Waste Management Plan shall be submitted for State Water Board review and approval within one year of the effective date of this Order.

d) Landslide Management Activities

The Department shall develop a **LANDSLIDE MANAGEMENT PLAN** that includes BMPs for Department construction and maintenance work landslide-related activities (e.g., prevention, containment, clean-up). The *Landslide Management Plan* shall address all forms of mass wasting such as slumps, mud flows, and rockfalls, and shall include BMPs specifically for burn site management activities. The Department shall submit the *Landslide Management Plan* with the Year 1 Annual Report and implement the *Landslide Management Plan* for the remainder of the Permit term.

¹¹ For purposes of this requirement, the term "urban" shall mean located within an "urbanized area" as determined by the latest Decennial Census by the Bureau of the Census (Urbanized Area).

4) *Surveillance Activities*

a) Spill Response

The Department will follow the applicable Emergency Management Agency (EMA) procedures and timelines specified in Water Code sections 13271 and 13272 for reporting spills.

b) Illegal Connection/Illicit Discharge (IC/ID) and Illegal Dumping Response

i) The Department shall implement the BMPs and other requirements of the SWMP and this Order to reduce and eliminate IC/IDs and illegal dumping.

ii) The Department shall develop an **IC/ID AND ILLEGAL DUMPING RESPONSE PLAN** that includes, at a minimum, the following:

- (a) Procedures for investigating reports or discoveries of IC/IDs or incidents of illegal dumping, for remediating or eliminating the IC/IDs, and for clean-up of illegal dump sites.
- (b) Procedures for prevention of illegal dumping at sites subject to repeat or chronic incidents of illegal dumping.
- (c) Procedures for educating the public, raising awareness and changing behaviors regarding illegal dumping, and encouraging the public to contact the appropriate local authorities if they witness illegal dumping.

Within 6 months of the effective date of this Order, the Department shall submit the **IC/ID AND ILLEGAL DUMPING RESPONSE PLAN** to the State Water Board Executive Director for approval.

iii) The Department shall report all suspected IC/IDs to the Regional Water Board.

c) Reporting Requirements for Trash and Litter

The Department shall report on the trash and litter removal activities that are currently underway or are initiated after adoption of this Order. Activities include, but are not limited to, storm drain maintenance, road sweeping, public education and the Adopt-A-Highway program. Reporting and assessment of these or future activities shall follow protocols established by the Department and shall include estimated annual volumes of the trash and litter removed. Results shall be submitted as part of the Annual Report in a summary format by District. Prior year's data shall be included to facilitate an analysis of trends.

d) Department Activities Outside the Department's Right-of-Way

The Department shall include provisions in its contracts that require the contractor to obtain and comply with applicable permits for project-related facilities and operations outside the Department's ROW. Facilities may include concrete or asphalt batch plants, staging areas, concrete slurry

processing or other material recycling operations, equipment and material storage yards, material borrow areas, and access roads.

5) *Maintenance Facility Compliance Inspections*

- a) District staff shall inspect all maintenance facilities at least twice annually. Follow up inspections shall be conducted when deficiencies are noted. The inspections are to identify areas contributing to a discharge of pollutants associated with maintenance facility activities, to determine if control practices to reduce pollutant loadings identified in the Facility Pollution Prevention Plans (FPPP) are adequate and properly implemented, and to determine whether additional control practices are needed. The District shall keep a record of inspections. The record of the inspections shall include the date of the inspection, the individual(s) who performed the inspection, a report of the observations, recommendations for any corrective actions identified or needed, and a description of any corrective actions undertaken.
- b) The Regional Water Board may require the Department to conduct additional site inspections, to submit reports and certifications, or to perform additional sampling and analysis to the extent authorized by the Water Code.
- c) Records of all inspections, compliance certifications, and non-compliance reporting shall be retained for a period of at least three years. With the exception of non-compliance reporting, the Department is not required to submit these records unless requested.

6) *Operation and Maintenance of Post-Construction BMPs*

The Department shall prepare and implement long-term operation and maintenance plans for every site subject to the post-construction storm water treatment design standards. The plans must ensure the following: a) Long-term structural LID BMPs are maintained as necessary to ensure they continue to work effectively; b) Proprietary devices are maintained according to the manufacturer's directions; and c) Post-construction BMPs are replaced if they lose their effectiveness.

i. Non-Departmental Activities

The Department shall summarize its control over all non-departmental (third party) activities performed on Department ROW in the SWMP. The summary shall describe how the Department shall ensure compliance with this Order in all non-departmental activities.

The Department shall not grant or renew encroachment permits or easements benefitting any third party required to obtain coverage under the Statewide Construction and/or Industrial Storm Water General Permits unless the party has obtained coverage. In all leases, rental agreements, and all other contracts with

third parties conducting activities within the ROW, the Department shall require the third party to comply with applicable requirements of the Construction General Permit, the Industrial General Permit, and this Order.

j. Non-Storm Water Activities/ Discharges

- 1) The Department shall describe the management activities for all non-storm water discharges in the SWMP. Management activities shall include the procedures for prohibiting illicit discharges and illegal connections, and procedures for spill response, cleanup, reporting, and follow-up.
- 2) *Agricultural Return Flows*
The Department shall provide reasonable support to the monitoring activities of agricultural dischargers whose runoff enters the MS4. Reasonable support includes facilitating monitoring activities, providing necessary access to monitoring sites, and cooperating with monitoring efforts as needed. It does not include actively conducting monitoring or providing funding. The Department may require agricultural dischargers to follow established Department access and encroachment procedures in establishing sites and conducting monitoring activities, and may deny access at sites that may restrict traffic flow or pose a danger to any party.
- 3) See Section B of this Order for the complete list of conditionally exempt non-storm water discharges and compliance requirements.

k. Training

- 1) The Department shall implement a training program for Department employees and construction contractors. The training program shall be described in the SWMP.
- 2) The training program shall cover:
 - a) Causes and effects of storm water pollution;
 - b) Regulatory requirements;
 - c) Best Management Practices;
 - d) Penalties for non-compliance with this Order; and
 - e) Lessons learned.
- 3) The Department shall provide a review and assessment of all training activities in the Annual Report.

I. Public Education and Outreach

The Department shall implement a Statewide Public Education Program and describe it in the SWMP. The Department shall continue to seek opportunities to participate in public outreach and education activities with other MS4 permittees.

1) The Statewide Public Education Program shall include the following elements:

- a) Research: A plan for conducting research on public behavior that affects the quality of the Department's runoff. The information gathered will form the foundation for all the public education conducted.
- b) Education: Education of the general public to modify behavior and communicate with commercial and industrial entities whose actions may add pollutants to the Department's storm water.
- c) Mass Media Advertising: Continue the advertising campaign as a focal point of the public education strategy. The campaign should focus on the behaviors of concern and should be designed to motivate the public to change those behaviors. The public education campaign should be revised and updated according to the results of the research. The Department may cooperate with other organizations to implement the public education campaign.

2) A **PUBLIC EDUCATION PROGRAM PROGRESS REPORT** shall be submitted as part of the Annual Report.

m. Program Evaluation

1) The Department shall implement the program specified in the SWMP and any additional requirements contained in this Order.

2) **Field Activities SELF-AUDIT**

The Department will perform compliance evaluations for field activities including construction, highway maintenance, facility maintenance, and selected targeted program components. The results of the field compliance evaluations for each fiscal year will be provided in the Annual Report.

3) **OVERALL PROGRAM EFFECTIVENESS EVALUATION:**

Each year, the Department shall submit an **OVERALL PROGRAM EFFECTIVENESS EVALUATION** together with the Annual Report. The Department shall increase the scope of the evaluation each year in response to the environmental monitoring data it collects. The effectiveness evaluation shall be comparable to that outlined in CASQA's *Municipal Stormwater Program Effectiveness Assessment Guidance*¹² and shall emphasize assessment of BMPs specifically targeting primary pollutants of concern. The effectiveness evaluation shall include, but is not limited to, the following components:

¹² <https://www.casqa.org/store/products/tabid/154/p-7-effectiveness-assessment-guide.aspx>

- a) Assessment of program effectiveness in achieving permit requirements and measurable objectives.
 - b) Assessment of program effectiveness in protecting and restoring water quality and beneficial uses.
 - c) Identification of quantifiable effectiveness measurements for each BMP, including measurements that link BMP implementation with improvement of water quality and beneficial use conditions.
 - d) Identification of how the Department will propose revisions to the SWMP to optimize BMP effectiveness when effectiveness assessments identify BMPs or programs that are ineffective or need improvement.
- n. Measurable Objectives
The Department shall implement the program specified in the SWMP and any additional requirements contained in this Order. In the SWMP, the Department shall identify measurable objectives to meet the SWMP's goals, proposed activities and tasks to meet the objectives, and a time schedule for the proposed activities and tasks. In the Annual Report, the Department shall report on its progress in meeting the measurable objectives.
- o. References
The Department shall provide references for all information, documents, and studies used in the development of the SWMP.

3. Annual Report

- a. The Department shall submit 13 copies of an **ANNUAL REPORT** to the State Water Board Executive Director by October 1 of each year. An electronic copy shall also be uploaded into SMARTS in the portable document format (PDF). The reporting period for the Annual Report shall be July 1 through June 30. The Annual Report shall contain all information and submittals required by this Order including, but not limited to:
 - 1) A District-by-District description of storm water pollution control activities conducted during the reporting period;
 - 2) A progress report on meeting the SWMP's measurable objectives;
 - 3) An Overall Program Effectiveness Evaluation as described in section E.2.m.3);
 - 4) Proposed revisions to the SWMP, including revisions to existing BMPs, along with corresponding justifications;
 - 5) A report on post-construction BMP maintenance activities;
 - 6) A list of non-approved BMPs that were implemented in each District during the reporting period including the type of BMP, reason for use, physical location, and description of any monitoring;
 - 7) An evaluation of project planning and design activities conducted during the year;

- 8) A summary of non-compliance with this Order and the SWMP as specified in Section E.2.c.6)b). The summary shall include an assessment of the effectiveness of any Department enforcement and penalties, and as appropriate, proposed solutions to improve compliance;
- 9) An evaluation of the Monitoring Results Report, including a summary of the monitoring results;
- 10) Proposed revisions to the Department's Vegetation Control Program;
- 11) Proposals for monitoring and control of non-storm water discharges that are found to be sources of pollutants as described in Section B. of this Order;
- 12) District Workplans (See below); and
- 13) Measures implemented to meet region-specific requirements.

A partial summary of reporting requirements is contained in Attachment IX of this Order.

b. ***DISTRICT WORKPLANS***

The Department shall submit ***DISTRICT WORKPLANS*** (workplans) for each District by October 1 of each year, as part of the Annual Report. The workplans will be forwarded to the appropriate Regional Water Board Executive Officer for acceptance. Workplans are deemed accepted after 60 days after receipt by the Regional Water Board unless rejected in writing. District staff shall meet with Regional Water Board staff on an annual basis prior to submittal of the workplans to discuss alternatives and ensure that appropriate post construction controls are included in the project development process through review of the workplan and early consultation and coordination between District and Regional Water Board staff. Workplans shall conform with the requirements of applicable Regional Water Board Basin Plans and shall include, at a minimum:

- 1) A description of all activities and projects, including maintenance projects, to be undertaken by the Districts. For all projects with soil disturbing activities, this shall include a description of the construction and post construction controls to be implemented;
- 2) The area of new impervious surface and the percentage of new impervious surface to existing impervious surface for each project;
- 3) The area of disturbed soil associated with each project or activity;
- 4) A description of other permits needed from the Regional Water Boards for each project or activity;
- 5) Potential and actual impacts of the discharge(s) from each project or activity;
- 6) The proposed BMPs to be implemented in coordination with other MS4 permittees to comply with WLAs and LAs assigned to the Department for specific pollutants in specific watersheds or sub watersheds;
- 7) The elements of the statewide monitoring program to be implemented in the District;

- 8) Identification of high-risk areas (such as locations where spills or other releases may discharge directly to municipal or domestic water supply reservoirs or ground water percolation facilities);
- 9) Spill containment, spill prevention and spill response and control measures for high-risk areas; and
- 10) Proposed measures to be taken to meet Region-specific requirements included in Attachment V.
- 11) An inventory of vulnerable road segments having slopes that are prone to erosion and sediment discharge.

4. TMDL Compliance Requirements

a. Implementation

The Department shall comply with all TMDL-related requirements identified in Attachment IV.

In addition, consistent with provision E.11.b of this Order, the State Water Board may reopen this Order to incorporate any modifications or revisions to the TMDLs in Attachment IV, or to incorporate any new TMDLs adopted during the term of this Order that assign a WLA to the Department or that identify the Department as a responsible party in the TMDL implementation plan.

b. Status Review Report

The Department shall prepare a **TMDL STATUS REVIEW REPORT** to be submitted with each Annual Report. The **TMDL STATUS REVIEW REPORT** shall include all information required in Attachment IV.

5. ASBS Compliance Requirements

a. Priority Discharges

Attachment III, ASBS Priority Discharge Locations, identifies representative monitoring locations where the Department has priority discharges to ASBS. Priority discharges are those that pose the greatest threat to water quality in the ASBS and which the State Water Board identifies to require monitoring and potential installation of structural or non-structural controls.

b. Alternate Locations

The Executive Director of the State Water Board may authorize revisions to Attachment III, ASBS Priority Discharge Locations, where access limitations or safety considerations make it infeasible to conduct monitoring. Alternate locations proposed by the Department shall be in as close proximity to the original priority discharge locations as is feasible.

c. Compliance Schedule

- 1) On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) to ASBS shall be effectively prohibited.
- 2) No later than September 20, 2013, the Department shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director that describes its strategy to comply with these provisions, including the requirement to maintain natural water quality in the affected ASBS (see provision E.5.d.). The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, shall be submitted no later than September 20, 2015 and shall be included in the SWMP.
- 3) Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these provisions shall be implemented.
- 4) Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these provisions shall be operational.
- 5) Within six (6) years of the effective date of the Exception, the Department must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the Department must re-sample the receiving water, pre- and post-storm. If after re-sampling, the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See Figure 2.
- 6) The Executive Director of the State Water Board may only authorize additional time to comply with provisions E.5.b.4) and E.5.b.5) above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If the Department claims physical impossibility, it shall notify the Executive Director of the State Water Board in writing within thirty (30) days of the date that the discharger Department first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in provisions E.5.c.4) or E.5.c.5). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Permit provision. The Department shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of

the delay on water quality, the measures taken or to be taken by the Department to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The Department shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

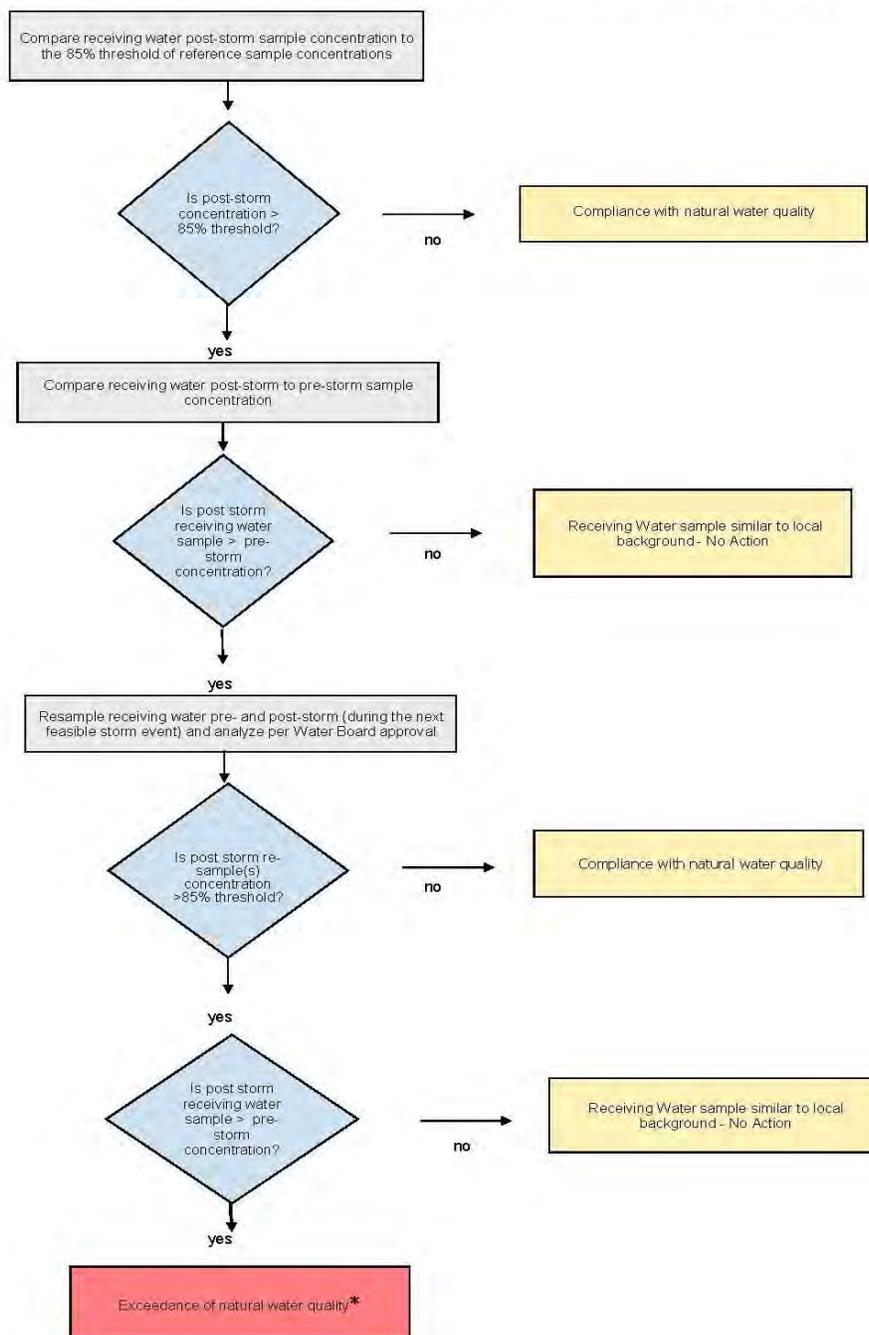
The Department may request an extension of time for compliance based on lack of funding. The request for an extension shall require a demonstration and documentation of a good faith effort to acquire funding through the Department's budgetary process, and a demonstration that funding was unavailable or inadequate.

d. ASBS Compliance Plan

The Department shall develop and submit to the Executive Director of the State Water Board a draft ASBS Compliance Plan not later than September 20, 2013. The ASBS Compliance Plan shall address all locations listed in Attachment III as follows:

- 1) Include a map of surface drainage of storm water runoff, showing areas of sheet runoff, priority discharge locations, and any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable.
- 2) Describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.
- 3) Require minimum inspection frequencies as follows:
 - a) The minimum inspection frequency for construction sites shall be weekly during the rainy season;
 - b) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season; and
 - c) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season, and maintained to remove trash and other anthropogenic debris.

Figure 2
ASBS Special Protections
Flowchart to Determine Compliance with Natural Water Quality



*** When an exceedance of natural water quality occurs, the Department must comply with section I.A.2.h of the Special Protections as well as the requirements of this Order. Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

- 4) Address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:
 - a) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or
 - b) A 90% reduction in pollutant loading during storm events, for the Department's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of the Special Protections.

- 5) Address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.
 - 6) Describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures currently employed and planned for higher threat discharges, and shall include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, the Department must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspire storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.
 - 7) The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.
- e. Reporting
- If the results of the receiving water monitoring described in provision E.2.c.2)a)i) indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days

of receiving the results.

- 1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.
- 2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP for future implementation, and any additional BMPs that may be added to the SWMP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.
- 3) Within 30 days of the approval of the report by the State Water Board Executive Director, the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.
- 4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

6. Region Specific Requirements

- a. The Department shall implement the region-specific requirements specified in this Order.
- b. In the SWMP, the Department shall describe how individual Districts will address region-specific requirements in each Regional Water Board.
- c. Region specific requirements are specified in Attachment V of this Order.

7. Regional Water Board Authorities

- a. Upon the effective date of this Order, the Regional Water Boards shall enforce the requirements of this Order. Enforcement may include, but is not limited to, reviewing FPPPs, reviewing workplans and monitoring reports, conducting compliance inspections, conducting monitoring, reviewing Annual Reports and other information, and issuing enforcement orders.
- b. Regional Water Boards may require submittal of FPPPs.
- c. Regional Water Boards may require retention of records for more than three years.
- d. To the extent authorized by the Water Code, Regional Water Boards may impose additional monitoring and reporting requirements and may provide guidance on monitoring plan implementation (Water Code, § 13383).
- e. Regional Water Board staff may inspect the Department's facilities, roads, highways, bridges, and construction sites.

- f. Regional Water Boards may issue other individual storm water NPDES permits or WDRs to the Department, particularly for discharges beyond the scope of this Order.

8. Requirements of Other Agencies

This Order does not preempt or supersede the authority of other State or local agencies (such as the Department of Toxic Substances Control or the California Coastal Commission) and local municipalities to prohibit, restrict, or control storm water discharges and conditionally exempt non-storm water discharges to storm drain systems or other watercourses within their jurisdictions as allowed by State and federal law.

9. Standard Provisions

The Department shall comply with the Standard Provisions (Attachment VI) and any amendments thereto.

10. Permit Compliance and Rescission of Previous Waste Discharge Requirements

This Order shall serve and become effective as an NPDES permit and the Department shall comply with all its requirements on July 1, 2013. Requirements prescribed by this Order supersede the requirements prescribed by Order No. 99-06-DWQ, except for compliance purposes for violations occurring before the effective date of this Order.

11. Permit Re-Opener

This Order may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations 122.62, 122.63, 122.64, and 124.5. The State Water Board may reopen and modify this Order at any time prior to its expiration under any of the following circumstances:

- a. Present or future investigations demonstrate that the discharge(s) regulated by this Order may have the potential to cause or contribute to adverse impacts on water quality and/or beneficial uses.
- b. New or revised Water Quality Objectives come into effect, or any new TMDL is adopted or revised that assigns a WLA to the Department or that identifies the Department as a responsible party in the TMDL implementation plan. In such cases, effluent limitations and other requirements in this Order may be modified as necessary to reflect the new TMDLs or the new or revised Water Quality Objectives; or
- c. TMDL-specific permit requirements for adopted TMDLs are developed by a Regional Water Board for incorporation into this Order.

- d. The State Water Board determines, after opportunity for public comment and a public workshop, that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

12. Dispute Resolution

In the event of a disagreement between the Department and a Regional Water Board over the interpretation of any provision of this Order, the Department shall first attempt to resolve the issue with the Executive Officer of the Regional Water Board. If a satisfactory resolution is not obtained at the Regional Water Board level, the Department may submit the issue in writing to the Executive Director of the State Water Board or his designee for resolution, with a copy to the Executive Officer of the Regional Water Board. The issue must be submitted to the Executive Director within ten days of any final determination by the Executive Officer of the Regional Water Board. The Executive Officer of the Regional Water Board will be provided an opportunity to respond.

13. Order Expiration and Reapplication

- a. This Order expires on June 30, 2018.
- b. If a new order is not adopted by June 30, 2018, then the Department shall continue to implement the requirements of this Order until a new one is adopted.
- c. In accordance with Title 23, Division 3, Chapter 9 of the California Code of Regulations, the Department shall file a report of waste discharge no later than 180 days before the expiration date of this Order as application for reissuance of this permit and waste discharge requirements. The application shall be accompanied by a SWMP, and a summary of all available water quality data for the discharge and receiving waters, including conventional pollutant data from at least the most recent three years, and toxic pollutant data from at least the most recent five years, in the discharge and receiving water. Additionally, the Discharger shall include the final results of any studies that may have a bearing on the limits and requirements of the next permit.

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

**FACT SHEET
FOR**

ORDER 2012-0011-DWQ

AS AMENDED BY
ORDER WQ 2014-0006-EXEC,
ORDER WQ 2014-0077-DWQ, AND
ORDER WQ 2015-0036-EXEC

NPDES NO. CAS000003
**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STATEWIDE STORM WATER PERMIT
WASTE DISCHARGE REQUIREMENTS (WDRS)
FOR
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

This Fact Sheet contains information regarding the waste discharge requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit for the California State Department of Transportation (Department) for discharges of storm water and certain types of non-storm water. This Fact Sheet describes the factual, legal, and methodological basis for the permit conditions, provides supporting documentation, and explains the rationale and assumptions used in deriving the limits and requirements.

BACKGROUND

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act (CWA)) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful, unless the discharge is in compliance with an NPDES permit. The 1987 amendments to the Clean Water Act added section 402(p). Section 402(p) establishes that storm water discharges are point source discharges and lays out a framework for regulating municipal and industrial storm water discharges under the NPDES program. On November 16, 1990, the United States Environmental Protection Agency (U.S. EPA) promulgated final regulations that establish the storm water permit requirements.

Pursuant to the 1990 regulations, storm water permits are required for discharges from a municipal separate storm sewer system (MS4) serving a population of 100,000 or more. U.S. EPA defines an MS4 as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned or operated by a State (40 Code of Federal Regulations

(C.F.R.), § 122.26(b)(8)). The regulations also require storm water permits for 11 categories of industry, including construction activities where the construction activity: (1) disturbs more than one (1) acre of land; (2) is part of a larger common plan of development; and/or (3) is found to be a significant threat to water quality.

Before July 1999, storm water discharges from Department storm water systems were regulated by individual NPDES permits issued by the Regional Water Quality Control Boards (Regional Water Boards). On July 15, 1999, the State Water Resources Control Board (State Water Board) issued a statewide permit (Order No. 99-06-DWQ), which regulated all storm water discharges from Department owned MS4s, maintenance facilities and construction activities. The existing permit (Order No. 99-06-DWQ) will be superseded by adoption of a new permit.

Industrial activities are covered by two General Permits that have been adopted by the State Water Board. The Department's construction activities are subject to the requirements under the NPDES General Permit for Construction Activities (CGP, NPDES Permit No. CAS000002) for construction activities that are equal to or greater than one (1) acre. The exception to this is in the Lake Tahoe area, where the Lahontan Regional Water Board adopted its own construction general permit (NPDES Permit No. CAG616002). The Department's industrial facility activities are subject to the requirements of the NPDES General Permit for Industrial Activities (IGP, NPDES Permit No. CAS000001).

The Department is responsible for the design, construction, management, and maintenance of the State highway system, including freeways, bridges, tunnels, the Department's facilities, and related properties. The Department's discharges consist of storm water and non-storm water discharges from State owned right-of-way (ROW).

Clean Water Act section 402(p) and 40 Code of Federal Regulations section 122.26 (a)(v) give the State authority to regulate discharges from an MS4 on a system-wide or jurisdiction-wide basis. The State Water Board considers all storm water discharges from all MS4s and activities under the Department's jurisdiction as one system. Therefore, this Order is intended to cover all of the Department's municipal storm water activities.

This Order will be implemented by the Department and enforced by the State Water Board and nine Regional Water Boards.

The Department operates highways and highway-related properties and facilities that cross through local jurisdictions. Some storm water discharges from the Department's MS4 enter the MS4s owned and managed by these local jurisdictions. This Order does not supersede the authority of local agencies to prohibit, restrict, or control storm water discharges and conditionally exempt non-storm water discharges to storm drain systems or other watercourses within their jurisdiction as allowed by State and federal law. The Department is expected to comply with the lawful requirements of municipalities and other local, regional, and/or state agencies regarding discharges of storm water to separate storm sewer systems or other watercourses under the agencies' jurisdictions.

GENERAL DISCHARGE PROHIBITIONS

This Order authorizes storm water and conditionally exempt non-storm water discharges from the Department's properties, facilities and activities. This Order prohibits the discharge of material other than storm water, unless specifically authorized in this Order.

The Department owns and operates highway systems that are located adjacent to and discharge into many ASBS. This Order specifies that Department discharges to an ASBS are prohibited except in compliance with the conditions and special protections contained in the General Exception for Storm Water and Non-Point Source Discharges to ASBS, State Water Board Resolution 2012-0012. This State Water Board resolution is hereby incorporated by reference and the Department is required to comply with applicable requirements. Attachment III identifies 77 priority Department ASBS discharge locations. These locations represent sites having significant potential to impact the ASBS that are feasible to retrofit. The following locations are not included in the list:

1. Inland sites discharging indirectly to the ASBS;
2. Sites where the discharge is attenuated through vegetation;
3. Sites where it is infeasible to install a BMP, e.g. an overhanging outfall or where there is insufficient space to install a treatment control; and
4. Sites that would pose a safety hazard to motorists, or that would be unsafe to install or maintain.

Provision E.5 of the Order requires the Department to ensure that structural controls at these locations are operational within six (6) years of the effective date of the General Exception.

NON-STORM WATER

Non-storm water discharges are subject to different requirements under the Order depending on whether they are discharged to ASBS.

Non-storm water discharges outside ASBS:

Non-storm water discharges must be effectively prohibited unless they are authorized by a separate NPDES permit or are conditionally exempt under provisions of the Order consistent with 40 CFR, §122.26 (d)(2) (iv)(B). Non-storm water discharges that are not specifically or conditionally exempted by this Order are subject to the existing regulations for point source discharges. Conditionally exempt non-storm water discharges that are found to be significant sources of pollution are to be effectively prohibited.

Discussion of Agricultural Return Flows:

The Department (2007a) indicated in its Non-Storm Water Report that agricultural irrigation water return flows carrying pollutants pass under the Department's ROW in many locations and enter its MS4. Agricultural return flows are not prohibited or conditionally exempted non-

storm water discharges and are not subject to the non-storm water requirements of the Order.

The regulations conditionally exempt MS4s from the requirement to effectively prohibit “irrigation water” discharges to the MS4. The regulations also completely exempt MS4s from addressing non-storm water discharges (also called “illicit discharges”) if they are regulated by an NPDES permit (40 C.F.R., §§ 122.26(b)(2); 122.26(d)(2)(iv)(B)). The term “irrigation water” is not defined and the regulations do not clarify whether that term is intended to encompass agricultural return flows that may run on to the Department’s rights of way.

Because agricultural return flows cannot be regulated by an NPDES permit, it is unlikely that they were intended to be treated as “illicit discharges” under the federal MS4 regulations. In discussing illicit non-storm water discharges and the requirement to effectively prohibit such discharges, the preamble of the Phase I final regulations states: “The CWA prohibits the *point source* discharge of non-storm water not subject to an NPDES permit through municipal separate storm sewers to waters of the United States. Thus, classifying such discharges as illicit properly identifies such discharges as being illegal” (55 FR 47996) (emphasis added). Implicit in this statement is that illicit discharges do not include non-point source discharges, including agricultural return flows, which are statutorily excluded from the definition of a point-source discharge (C.W.A., § 502(14)).¹³

Clean Water Act Section 402(l)(1) states that an NPDES permitting agency “shall not require a permit under this section for discharges composed entirely of return flows from irrigated agriculture.” Accordingly, agricultural return flows co-mingling with an illicit discharge would be treated as a point source discharge. This fact, however, does not lead the State Water Board to find that agricultural return flows should be subject to the conditional prohibition on non-storm water discharges.

First, the illicit discharge prohibition acts to prevent non-storm water discharges “*into* the storm sewers” (C.W.A., § 402(p)(3)(B)(ii)) (emphasis added). Based on a plain reading of the statutory language,¹⁴ a determination of what constitutes an illicit discharge should be made with reference to the nature of the discharge as it enters the MS4. Unless the agricultural return flow has co-mingled with a point source discharge prior to entering the MS4, it is not subject to the discharge prohibition. Further, since certain point source discharges are conditionally exempted from the requirement for effective prohibition under 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(1), the fact that the agricultural return flow may have co-mingled with such an exempted dry weather point source discharge prior to entering the MS4 does not render it an illicit discharge subject to the effective

¹³ Elsewhere in the preamble, EPA refers to the conditionally exempted non-storm water discharges as “seemingly innocent flows that are characteristic of human existence *in urban environments* and which discharge to municipal separate storm sewers” (55 F.R.48037) (emphasis added). This language further suggests that the term “irrigation water” was not intended to encompass irrigation return flows characteristic of a rural area.

¹⁴ 40 C.F.R. §122.26(d)(2)(iv)(B)(1) similarly states that the MS4 is to “prevent illicit discharges *to* the municipal separate storm sewer system.” (Emphasis added.)

prohibition.¹⁵ See *Fishermen Against the Destruction of the Environment, Inc. v. Closter Farms, Inc.* (11th Cir. 2002) 300 F.3d 1294.

Second, even assuming that the agricultural return flow mingling with a point source discharge *after* entering the MS4 would trigger the requirements related to non-storm water discharges, agricultural return flows are not expected to require an effective prohibition. Irrigation of agricultural fields typically occurs in dry weather, not wet weather, and therefore the State Water Board anticipates that irrigation return flows into the Department's MS4 would generally not co-mingle with discharges other than exempt non-storm water discharges.

Further, agricultural return flows entering an MS4, while not regulated by an NPDES permit, are through much of the State regulated under WDRs, waivers, and Basin Plan prohibitions. The regulations exempt MS4s from addressing non-storm water discharges that are regulated by an NPDES permit. Flows to the Department's MS4 regulated through state-law based permits are subject to regulatory oversight analogous to being subject to an NPDES permit. The appropriate regulatory mechanism for these discharges is the non-point source regulatory programs and not a municipal storm water permit.¹⁶

Non-Storm Water Discharges to ASBS:

Non-storm water discharges to ASBS are prohibited except as specified in the General Exception. Certain enumerated non-storm water discharges are allowed under the General Exception if essential for emergency response purposes, structural stability, slope stability, or if occur naturally.

Discussion of Utility Vault Discharges:

In addition, an NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. This Order allows utility vault discharges to segments of the Department MS4 with a direct discharge to an ASBS, provided the discharge is authorized by the General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surface Water, NPDES No. CAG 990002. The State Water Board is in the process of reissuing the General NPDES Permit for Utility Vaults. As part of the renewal, the State Water Board will require a study to characterize representative utility vault discharges to an MS4 with a direct discharge to an ASBS and will impose conditions on such discharges to ensure the discharges do not alter natural ocean water quality in the ASBS. Given the limited number of utility vault discharges to MS4s that

¹⁵ The Federal Register discussion clarifies that "irrigation return flows are excluded from regulation under the NPDES program," but that "joint discharges," i.e. discharges with a component "from activities unrelated to crop production" may be regulated (55 FR 47996).

¹⁶ It should also be noted that the Department has limited control options since up gradient flows such as agricultural runoff must in many cases be allowed to flow under or alongside the roadway so as to not threaten roadway integrity.

discharge directly to an ASBS, the State Water Board finds that discharges from utility vaults and underground structures to MS4s with a direct discharge to an ASBS are not expected to result in the MS4 discharge causing a substantial alteration of natural ocean water quality in the ASBS in the interim period while the General NPDES Permit for Discharges from Utility Vaults is renewed and the study is completed. However, if a Regional Water Board determines a specific discharge from a utility vault or underground structure does alter the natural ocean water quality in an ASBS, the Regional Water Board may prohibit the discharge as specified in this Order. It should also be noted that, under the California Ocean Plan Section III.E.2 (Implementation Provisions for ASBS), limited-term activities that result in temporary and short-term changes in existing water quality in the ASBS may be permitted.

EFFLUENT LIMITS

The State of California Nonpoint Source Program Five-Year Implementation Plan (SWRCB, 2003) (the Plan) describes a variety of pollutants in urban storm water and non-storm water that are carried in MS4 discharges to receiving waters. These include oil, sand, de-icing chemicals, litter, bacteria, nutrients, toxic materials and general debris from urban and suburban areas. The Plan identifies construction as a major source of sediment erosion and automobiles as primary sources of petroleum hydrocarbons.

The Natural Resources Defense Council (NRDC) also identified two main causes of storm water pollution in urban areas (NRDC, 1999). Both identified causes are directly related to development in urban and urbanizing areas:

1. Increased volume and velocity of surface runoff. There are three types of human-made impervious cover that increase the volume and velocity of runoff: (i) rooftops, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.
2. The concentration of pollutants in the runoff. Certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in urban runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc.

As a result of these two causes, runoff leaving developed urban areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

NPDES storm water permits must meet applicable provisions of sections 301 and 402 of the Clean Water Act. For discharges from an MS4, Clean Water Act section 402(p)(3)(B)(iii) requires control of pollutants to the maximum extent practicable (MEP). A permitting agency also has the discretion to require dischargers to implement more stringent controls, if

necessary, to meet water quality standards (*Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1166.), (discussed below under Receiving Water Limitations).

MEP is the technology-based standard established by Congress in Clean Water Act section 402(p)(3)(B)(iii) that municipal dischargers of storm water must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve. MEP is generally achieved by emphasizing pollution prevention and source control BMPs as the first lines of defense in combination with structural and treatment methods where appropriate. The MEP approach is an ever evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP.

In a precedential order (State Water Board Order WQ 2000-11 (In the Matter of the petitions of the Cities of Bellflower et al.)), the State Water Board has stated as follows:

While the standard of MEP is not defined in the storm water regulations or the Clean Water Act, the term has been defined in other federal rules. Probably the most comparable law that uses the term is the Superfund legislation, or CERCLA, at section 121(b). The legislative history of CERCLA indicates that the relevant factors, to determine whether MEP is met in choosing solutions and treatment technologies, include technical feasibility, cost, and state and public acceptance. Another example of a definition of MEP is found in a regulation adopted by the Department of Transportation for onshore oil pipelines. MEP is defined as to “the limits of available technology and the practical and technical limits on a pipeline operator”

These definitions focus mostly on technical feasibility, but cost is also a relevant factor. There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. Thus while cost is a factor, the Regional Water Board is not required to perform a cost-benefit analysis.

The final determination of whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the permitting agency, and not by the discharger.

Because of the numerous advances in storm water regulation and management and the size of the Department’s MS4, this Order does not require the Department to fully incorporate and

implement all advances in a single permit term. The Order allows for prioritization of efforts to ensure the most effective use of available funds.

This Order will have an impact on costs to the Department above and beyond the costs from the Department's prior permit. Such costs will be incurred in complying with the post-construction, hydrograph modification, Low Impact Development, and monitoring and reporting requirements of this Order. Additional costs will also be incurred in correcting non-compliant discharges. Recognizing that there are cost increases associated with the Order, the State Water Board has prepared a cost analysis to approximate the anticipated cost associated with implementing this permit. The resulting cost analysis is discussed later in this Fact Sheet under the section on "Cost of Compliance and Other MEP Considerations." The cost analysis has been prepared based on available data and is not a cost-benefit analysis.

The individual and collective activities required by this Order and contained in the Department's Storm Water Management Plan (SWMP) meet the MEP standard.

RECEIVING WATER LIMITATIONS

Under federal law, an MS4 permit must include "controls to reduce the discharge of pollutants to the maximum extent practicable . . . and such other provisions as . . . the State determines appropriate for the control of such pollutants." (Clean Water Act §402(p)(3)(B)(iii).) The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F3d 1159.). The Proposed Order accordingly prohibits discharges that cause or contribute to violations of water quality standards.

The Proposed Order further sets out that, upon determination that a Permittee is causing or contributing to an exceedance of applicable water quality standards, the Permittee must engage in an iterative process of proposing and implementing additional control measures to prevent or reduce the pollutants causing or contributing to the exceedance. This iterative process is modeled on receiving water limitations set out in State Water Board precedential Order WQ 99-05 and required by that Order to be included in all municipal storm water permits.

The Ninth Circuit held in *Natural Resources Defense Council, Inc. v. County of Los Angeles* (2011) 673 F.3d 880 that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State Water Board and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Boards or through a citizen suit. While the Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the Board retains the discretion to

take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits.

The State Water Board has received multiple comments, from the Department and from other interested parties, expressing confusion and concern about the Order provisions regarding receiving water limitations and the iterative process. The Department has commented that the provisions as currently written do not provide the Department with a viable path to compliance with the proposed Order. Other commenters, including environmental parties, support the current language.

As stated above, the provisions in this Order regarding receiving water limitations and the iterative process are based on precedential Board orders. Accordingly, substantially identical provisions are found in the proposed statewide Phase II MS4 NPDES permit, as well as the Phase I NPDES permits issued by the Regional Water Boards. In the context of the proposed Phase II MS4 permit, similar comments have been received. Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board has proposed a public workshop to consider this issue and seek public input.

Rather than delay consideration of adoption of the tentative Order in anticipation of any future changes to the receiving water limitations and iterative process provisions that may result from the public workshop and deliberation, the Board has added a specific reopener clause at Section 11.d. to facilitate any future revisions as necessary.

NUMERIC EFFLUENT LIMITATIONS AND BLUE RIBBON PANEL OF EXPERTS

Under 40 Code of Federal Regulations section 122.44(k)(2)&(3); the State Water Board may impose BMPs for control of storm water discharges in lieu of numeric effluent limitations.¹⁷

In 2005, the State Water Board assembled a blue ribbon panel to address the feasibility of including numeric effluent limits as part of NPDES municipal, industrial, and construction storm water permits. The panel issued a report dated June 19, 2006, which included recommendations as to the feasibility of including numeric limitations in storm water permits, how such limitations should be established, and what data should be required (SWRCB, 2006).

¹⁷ On November 12, 2010, U.S. EPA issued a revision to a November 22, 2002 memorandum in which it had “affirm[ed] the appropriateness of an iterative, adaptive management best management practices (BMP) approach” for improving storm water management over time. In the revisions, U.S. EPA recommended that, in the case the permitting authority determines that MS4 discharges have the reasonable potential to cause or contribute to a water quality excursion, the permitting authority, where feasible, include numeric effluent limitations as necessary to meet water quality standards. However, the revisions recognized that the permitting authority’s decision as to how to express water quality based effluent limitations (WQBELs), i.e. as numeric effluent limitations or BMPs, would be based on an analysis of the specific facts and circumstances surrounding the permit. U.S. EPA has since invited comment on the revisions to the memorandum and will be making a determination as to whether to “either retain the memorandum without change, to reissue it with revisions, or to withdraw it.”

http://www.epa.gov/npdes/pubs/sw_tmdlwla_comments_pdf

The report concluded that “It is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges. However, it is possible to select and design them much more rigorously with respect to the physical, chemical and/or biological processes that take place within them, providing more confidence that the estimated mean concentrations of constituents in the effluents will be close to the design target.”

Consistent with the findings of the Blue Ribbon Panel and precedential State Water Board orders (State Water Board Orders Nos. WQ 91-03 and WQ 91-04), this Order allows the Department to implement BMPs to comply with the requirements of the Order.

In 1980, the State Water Resources Control Board adopted concentration-based numeric effluent limitations for total nitrogen, total phosphate, total iron, turbidity, and grease and oil for storm water discharges in the Lake Tahoe Basin. The Lahontan Regional Water Board included revised versions of those limitations in Table 5.6-1 of the Water Quality Control Plan for the Lahontan Region (Basin Plan). The numeric effluent limitations in Table 5.6-1 were included in previous iterations of the Department's MS4 permit. This Order does not include these referenced numeric effluent limitations. The TMDL for sediment and nutrients in Lake Tahoe, approved by U.S. EPA on August 16, 2011, removed statements from the Basin Plan requiring the effluent limitations in Table 5.6-1 to apply to municipal jurisdictions and the Department. The Lake Tahoe TMDL would constitute cause for permit revocation and reissuance in accordance with 40 Code of Federal Regulations section 122.62(a)(3), so the removal of the referenced numeric effluent limitations is consistent with 40 Code of Federal Regulations section 122.44(l)(1). Further, any water quality based effluent limitations in MS4 permits are imposed under section 402(p)(3)(B) of the Clean Water Act rather than under section 301(b)(1)(C), and are accordingly not subject to the antibacksliding requirements of section 402(o). The Order requires compliance with pollutant load reduction requirements established by the Lake Tahoe TMDL for total nitrogen, total phosphorus, and fine sediment particles.

OTHER PROVISIONS OF THIS ORDER

Storm Water Management Plan (SWMP)

The SWMP describes the procedures and practices that the Department proposes to reduce or eliminate the discharge of pollutants to storm drainage systems and receiving waters. On May 17, 2001, the State Water Board approved a Storm Water Management Plan submitted by the Department. That SWMP was updated in 2003 (Department, 2003c) and the updates were approved by the Executive Director of the State Water Board on February 13, 2003. On January 15, 2004, the Department submitted a proposed Storm Water Management Plan as part of its NPDES permit application to renew its previous statewide storm water permit (Order No. 99-06-DWQ). The State Water Board and Regional Water Board staff and the Department discussed and revised Best Management Practices (BMP) controls and many

other components proposed in each section of the SWMP during numerous meetings from January 2004 to 2006. The Department submitted a revised SWMP in June 2007 (Department, 2007c). The 2004 and 2007 SWMPs have not been approved by the State Water Board and the Department has continued to implement the 2003 SWMP. The Department is in the process of revising aspects of the 2003 SWMP to address the Findings of Violation and Order for Compliance issued by U.S. EPA in 2011 (U.S. EPA Docket No. CWA-09-2011-0001).

This Order requires the Department to update, maintain and implement an effective SWMP that describes how the Department will meet requirements of this Order. Within one year of the effective date of the Order, the Department shall submit for Executive Director approval a SWMP consistent with the provisions and requirement of the Order. The SWMP is an integral and enforceable component of this Order and is required to be updated on an annual basis.

In ruling upon the adequacy of federal regulations for discharges from small municipal storm sewer systems, the court in *Environmental Defense Center v. United States EPA* (9th Cir. 2003) 344 F.3d 832 held that NPDES “notices of intent” that required the inclusion of a proposed storm water management program (SWMP) are subject to the public participation requirements of the federal Clean Water Act because they are functionally equivalent to NPDES permit applications and because they contain “substantive information” about how the operator will reduce its discharges to the maximum extent practicable. By implication, the public participation requirements of the Clean Water Act may also apply to proposals to revise the Department’s SWMP. Although the Proposed Order contains significantly more detailed and prescriptive requirements for achievement of MEP than previously adopted orders for the Department, some of the substantive information about how MEP will be achieved is arguably still set out in the SWMP. This Order accordingly provides for public participation in the SWMP revision process. However, because there may be a need for numerous revisions to the SWMP during the term of this Order, a more streamlined approach to SWMP revisions is needed to provide opportunities for public hearings while preserving the State Water Board’s ability to effectively administer its NPDES storm water permitting program. (See *Costle v. Pacific Legal Foundation* (1980) 445 U.S. 198, 216-221, *Natural Resources Defense Council v. Costle* (9th Cir. 1977) 568 F.2d 1369, 1382.)

This Order establishes that revisions to the SWMP requiring Executive Director approval will be publicly noticed for thirty days on the State Water Board’s website (except as otherwise specified). During the public notice period, a member of the public may submit a written comment or request that a public hearing be conducted. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. Upon review of the request or requests for a public hearing, the Executive Director may, in his or her discretion, schedule a public hearing to take place before approval of the SWMP revision. The Executive Director shall schedule a hearing if there is a significant degree of public interest in the proposed revision. If no public hearing is conducted, the Executive Director may approve the SWMP revision if it meets the conditions set forth in this Order.

Any SWMP revision approved by the Executive Director will be posted on the State Water Board's website.

The Department references various policies, manuals, and other guidance related to storm water in the SWMP. These documents are intended to facilitate implementation of the SWMP and must be consistent with all requirements of the Order.

In addition to the annual submittal of the proposed SWMP revisions, this Order also requires the Department to submit workplans that explain how the program will be implemented in each District. The purpose of the workplans is to bring the proposed statewide program of the SWMP to the practical and implementable level at the District, watershed, and water body level.

Legal Authority

The Department has submitted a certification of adequate legal authority to implement the program. Through implementation of the storm water program, the Department may find that the legal authority is, in fact, not adequate. This Order requires the Department to reevaluate the legal authority each year and recertify that it is adequate. The Department is required to submit the Certification of the Adequacy of Legal Authority as part of the Annual Report each year. If it becomes clear that the legal authority is not adequate to fully implement the SWMP and the requirements of this Order, the Department must seek the authority necessary for implementation of the program.

SWMP Implementation Requirements

Management and Organization

The Department must maintain adequate funding to implement an effective storm water program and must submit an analysis of the funding each year. This includes a report on the funding that is dedicated to storm water as well as an estimate of the funding that has been allocated to various program elements that are not included in the storm water program funding. An example of this would be to estimate the funding that has been made available to the Maintenance Program to implement the development of Maintenance Facility Pollution Prevention Plans (FPPP) and to implement the Best Management Practices (BMPs) that are necessary for water quality.

The Department's facilities and rights-of-way may cross or overlap other MS4s. The Department is required to coordinate their activities with other municipalities and local governments that have responsibility for storm water runoff. This Order requires the Department to prepare a Municipal Coordination Plan describing the approach that the Department will take in establishing communication, coordination, cooperation and collaboration with other storm water management programs.

Discharge Monitoring and Reporting Program

Since 1998, the Department has conducted monitoring of runoff from representative transportation facilities throughout California. The key objectives of the characterization

monitoring were to produce scientifically credible data on runoff from the Department's facilities, and to provide useful information in designing effective storm water management strategies. Between 2000 and 2003, the Department conducted a three-year characterization monitoring study (Department, 2003b). The study generated over 60,000 data points from over 180 monitoring sites. Results were compared with California Toxics Rule (CTR) objectives and other relevant receiving water quality objectives (U.S. EPA, 2000b). Copper, lead, and zinc were estimated to exceed the CTR objectives for dissolved and total fractions in greater than 50 percent of samples. Diazinon and chlorpyrifos were also found to exceed the California Department of Fish and Game recommended chronic criteria in a majority of samples.

The discharge monitoring program has been structured to focus on the highest priority water quality problems in order to ensure the most effective use of limited funds. A tiered approach is established that gives first priority to monitoring in ASBS and TMDL watersheds. Monitoring in these locations must be conducted pursuant to the applicable requirements of the ASBS Special Protections or TMDL, without limitation as to the number of sites. The second monitoring tier requires the Department to examine and prioritize existing monitoring locations where existing data show elevated levels of pollutants. Fifteen percent of the highest priority sites must be scheduled for retrofit, with a maximum of 100 sites per year.

Monitoring constituents were chosen by the State Water Board from the results of the Department's comprehensive, multi-component storm water characterization monitoring program conducted in 2002 and 2003 and various other characterization studies.

Toxicity in storm water discharges from the Department's rights-of-way has been reported in a number of studies. A 2005 report prepared for the Department by the University of California at Davis "Toxicity of Storm Water from Caltrans Facilities" reported significant occurrences of acute and chronic toxicity (Department, 2005). Toxicity Identification Evaluations showed toxicity from a number of compounds, including heavy metals, organic compounds, pesticides and surfactants. Toxicity testing is required under the Order, and a workplan for conducting Toxicity Reduction Evaluations is required to be included in the SWMP.

Monitoring data must be filed electronically in the Storm Water Multiple Application Report and Tracking System (SMARTS). Receiving water monitoring data must be comparable¹⁸ with the Surface Water Ambient Monitoring Program (SWAMP), (SWAMP, 2010), and must be uploaded to the California Data Exchange Network (CEDEN).

¹⁸ U.S. EPA defines comparability as the measure of confidence with which one data set, element, or method can be considered as similar to another. Functionally, SWAMP comparability is defined as adherence to the SWAMP Quality Assurance Program Plan and the Surface Water Ambient Monitoring Program Information Management Plan.

Incident Reporting - Non-Compliance and Potential/Threatened Non-Compliance

The Department may at times be out of compliance with the requirements of this Order. Incidents of non-compliance and potential or threatened non-compliance must be reported to the State and Regional Water Boards. This Order identifies the conditions under which non-compliance reporting will be required. This Order distinguishes between emergency, field, and administrative (procedural) incidents that require notification to the State and Regional Water Boards, and requires that a summary of non-compliance incidents and the subsequent actions taken by the Department to reduce, eliminate and prevent the reoccurrence of the non-compliance be included in the Annual Report.

Emergency, field and administrative incidents are defined in Attachment I and have separate reporting requirements. Generally, failure to meet any permit requirement that is local or regional in nature will be reported to the Regional Water Boards. Attachment I outlines the reporting timelines for the three categories. This reporting will be conducted through the Storm Water Multiple Application Report and Tracking System (SMARTS)¹⁹. Distribution of this report internally between the State Water Board and any Regional Water Boards will be conducted through this system.

Project Planning and Design

In Order WQ 2000-11, the State Water Board considered Standard Urban Storm Water Mitigation Plans (SUSMPs) related to new development and redevelopment. The SUSMPs include a list of BMPs for specific development categories, and a numeric design standard for structural or treatment control BMPs. The numeric design standard created objective and measurable criteria for the amount of runoff that must be treated or infiltrated by BMPs. While this Order does not regulate construction activities, it does regulate the post-construction storm water runoff pursuant to municipal storm water regulations. SUSMPs are addressed in this Order through the numeric sizing criteria that apply to treatment BMPs at specified new and redevelopment projects and through requirements to implement Low Impact Development through principles of source control, site design, and storm water treatment and infiltration.

The Order provides the Department with an alternative compliance method for complying with the Treatment Control BMP numeric sizing criteria for projects where on-site treatment is infeasible. Under that method, the Department may propose complying with the requirements by installing and maintaining equivalent treatment BMPs at an offsite location (meaning outside of Project Limits) within the watershed, or by contributing funds to achieve the same amount of treatment at a regional project within the watershed. This compliance method will provide some flexibility to the Department in meeting the treatment control requirements.

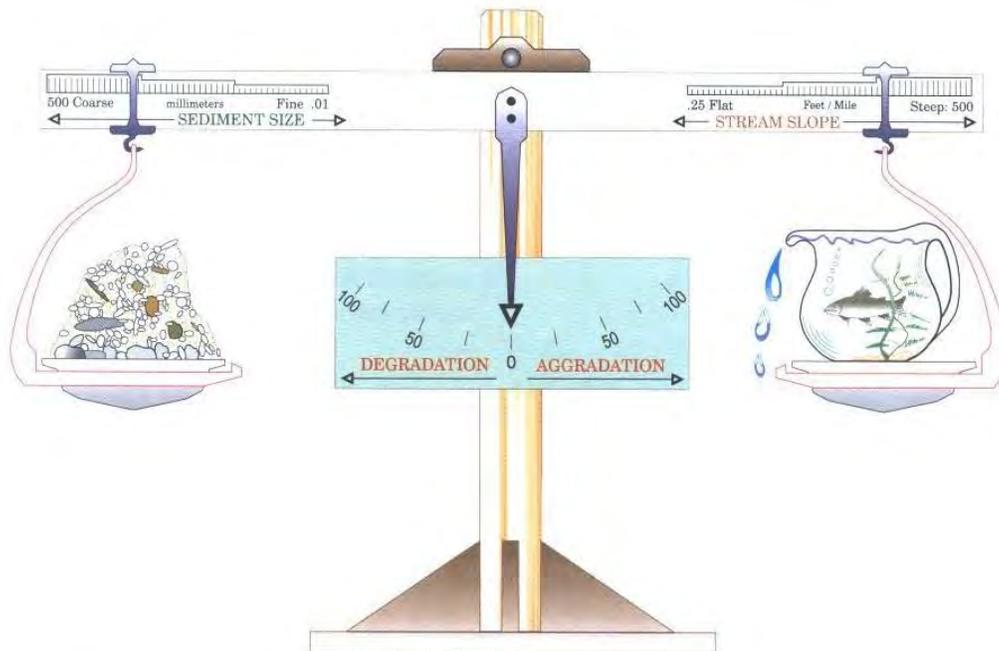
¹⁹ <https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp>

Hydromodification and Channel Protection

Department development and redevelopment projects have the potential to negatively impact stream channels and downstream receiving waters. The potential impacts of hydromodification by Department projects must be assessed in the project planning and design stage, and measures taken to mitigate them. This section describes the rationale and approach for the hydromodification and channel protection requirements.

A dominant paradigm in fluvial geomorphology holds that streams adjust their channel dimensions (width and depth) in response to long-term changes in sediment supply and bankfull discharge. The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which the moving sediment, forming or removing bars, and forming or changing bends and meanders, are doing work that results in the average morphologic characteristics of channels (Finkenbine, 2000). A.W. Lane showed the generalized relationship between sediment load, sediment size, stream discharge and stream slope, as shown in Figure 1, (Rosgen, 1996). A change in any one of these variables sets up a series of mutual adjustments in the companion variables resulting in a direct change in the physical characteristics of the stream channel.

Figure 1 - Schematic of the Lane Relationship



$$(\text{Sediment LOAD}) \times (\text{Sediment SIZE}) \quad \propto \quad (\text{Stream SLOPE}) \times (\text{Stream DISCHARGE})$$

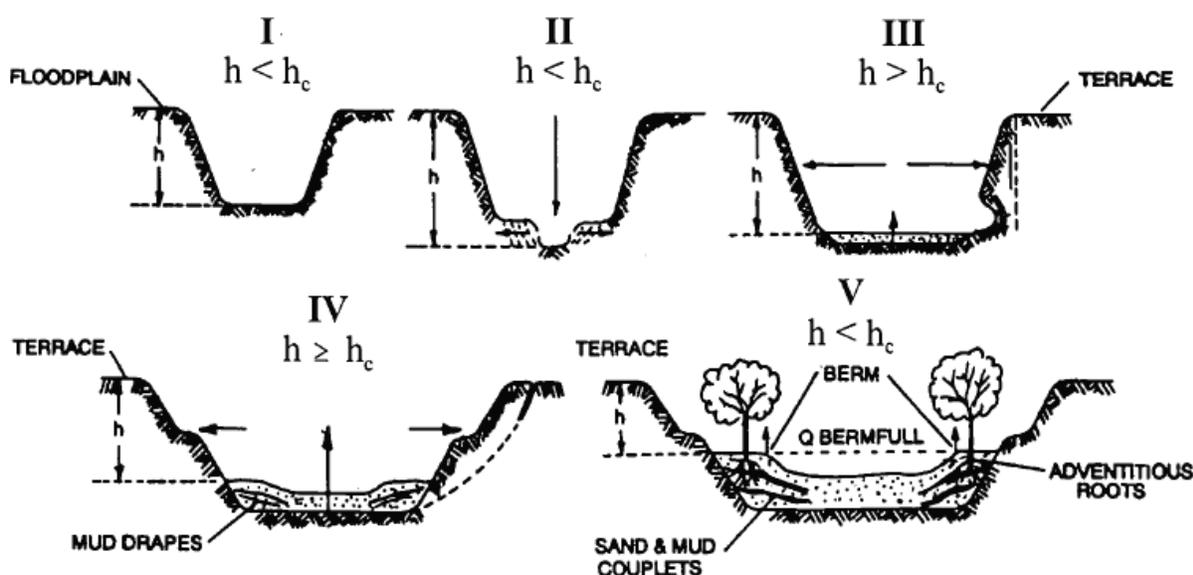
After Lane (1955) as cited in Rosgen (1996)

Stream slope times stream discharge (the right side of the scale) is an approximation of stream power, a unifying concept in fluvial geomorphology (Bledsoe, 1999). Urbanization generally increases stream power and affects the resisting forces in a channel (represented as sediment load and sediment size on the left side of the scale).

During construction, sediment loads can increase from 2 to 40,000 times over pre-construction levels (Goldman, 1986). Most of this sediment is delivered to stream channels during large, episodic rain events (Wolman, 2001). This increased sediment load leads to an initial aggradation phase where stream depths may decrease as sediment fills the channel, leading to a decrease in channel capacity and an increase in flooding and overbank deposition. A degradation phase initiates after construction is completed.

Schumm et al (Schumm, 1984) developed a channel evolution model that describes the series of adjustments from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 2).

Figure 2 - Channel Changes Associated with Urbanization



h = bank height

h_c = critical bank height (the bank is susceptible to failure when bank heights are greater than critical bank height. Stable banks have low angles and heights)

After Incised Channel Evolution Sequence in Schumm et al. 1984

Channel incision (Stage II) and widening (Stages III and to a lesser degree, Stage IV) are due to a number of fundamental changes on the landscape. Connected impervious area and compaction of pervious surfaces increase the frequency and volume of bankfull discharges (Stein, 2005; Booth, 1997), resulting in an increase in stream power. Increased drainage density (miles of stream length per square mile of watershed) also affects receiving channels (May, 1998; SCVURPPP, 2002). Increased drainage density and hydraulic efficiency leads to an increase in the frequency and volume of bankfull discharges because the time of concentration is shortened. Flows from engineered pipes and channels are also often “sediment starved” and seek to replenish their sediment supply from the channel.

Encroachment of stream channels can also lead to an increase in stream slope, which leads to an increase in stream power. In addition, watershed sediment loads and sediment size (with size generally represented as the median bed and bank particle size, or d_{50}) decrease during urbanization (Finkenbine, 2000; Pizzuto, 2000). This means that even if pre- and post-development stream power are the same, more erosion will occur in the post-development stage because the smaller particles are less resistant.

As shown in Stages II and III, the channel deepens and widens to accommodate the increased stream power (Hammer, 1973; Booth, 1990) and decrease in sediment load and sediment size. Channels may actually narrow as entrained sediment from incision is deposited laterally in the channel (Trimble, 1997). After incised channels begin to migrate laterally (Stage III), bank erosion begins, which leads to general channel widening (Trimble, 1997). At this point, a majority of the sediment that leaves a drainage area comes from within the channel, as opposed to the background and construction related hillslope contribution (Trimble, 1997). Stage IV is characterized by more aggradation and localized bank instability. Stage V represents a new quasi-equilibrium channel morphology in balance with the new flow and sediment supply regime. In other words, stream power is in balance with sediment load and sediment size.

The magnitude of the channel morphology changes discussed above varies along a stream network as well as with the age of development, slope, geology (sand-bedded channels may cycle through the evolution sequence in a matter of decades whereas clay-dominated channels may take much longer), watershed sediment load and size, type of urbanization, and land use history. It is also dependent on a channel's stage in the channel evolution sequence when urbanization occurs. Management strategies must take into account a channel's stage of adjustment and account for future changes in the evolution of channel form (Stein, 2005).

The hydromodification requirements in this Order are based on established Federal Highway Administration procedures for assessing stream stability at highway crossings. These procedures are geomorphically based and have historically been used to inform bridge and culvert design and to ensure that these structures are not impacted by decreased lateral and vertical stability (FHWA, 2001; FHWA, 2006). Maintaining lateral and vertical stability will not only protect highway structures but will serve the broader interest of maintaining stable stream form and function.

These hydromodification requirements are risk based and reflect the concept that stable channels (as determined from a Level 1 rapid analysis) do not have to undergo any further analysis and that hydrology-based design standards are protective.

If stream channels are determined to be laterally and or vertically unstable, the analysis procedures are much more rigorous and the mitigation measures are potentially more extensive. There is support in the literature for the type of tiered, risk-based approach taken in this Order (Booth, 1990; Watson, 2002; Bledsoe, 2002; Bledsoe et al., 2008).

California Senate Bill 857 (2006) amended Article 3.5 of the Streets and Highways Code to require the Department to assess and remediate barriers to passage of anadromous fish at stream crossings along the State Highway System. The bill also requires the Department to, among other things, prepare an annual report to the legislature on the status of the Department's efforts in locating, assessing, and remediating barriers to fish passage. Waters of the State supporting the beneficial use of fish migration could be adversely impacted by improperly designed or maintained stream crossings, or through natural channel evolution processes. Accordingly, this Order requires the Department to also submit the annual report required under SB 857 to the State Water Board.

Low Impact Development (LID)

On January 20, 2005, the State Water Board adopted sustainability as a core value for all California Water Boards' activities and programs, and directed State Water Board staff to consider sustainability in all future policies, guidelines, and regulatory actions. Sustainability can be achieved through appropriate implementation of the LID techniques required by this Order.

The proper implementation of LID techniques not only results in water quality protection benefits and a reduction of land development and construction costs, but also enhances property values, and improves habitat, aesthetic amenities, and quality of life (U.S. EPA, 2007). Further, properly implemented LID techniques reduce the volume of runoff leaving a newly developed or re-developed area thereby lowering the peak rate of runoff, and thus minimizing the adverse effects of hydromodification on stream habitat (SWRCB, 2007). The requirements of this Order facilitate the implementation of LID strategies to protect water quality, reduce runoff volume, and to promote sustainability.

Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID takes a different approach by using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's pre-development hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall. LID has been a proven approach in other parts of the country and is seen in California as an alternative to conventional storm water management.

LID is a tool that can be used to better manage natural resources and limit the pollution delivered to waterways. To achieve optimal benefits, LID needs to be integrated with watershed planning and appropriate land use programs. LID by itself will not deliver all the water quality outcomes desired; however, it does provide enhanced storm water treatment and mitigates increased volume and flow rates (SWRCB, 2007).

This Order approaches LID through source control design principles, site design principles and storm water treatment and infiltration principles. Source control and site design principles are required as applicable to provide enough flexibility such that projects are not forced to include inappropriate or impractical measures. Not all of the storm water treatment

and infiltration principles identified in the Order are required to be implemented but are listed in order of preference with the most environmentally protective and effective alternatives listed first.

BMP Development and Implementation

The Department has developed a BMP program for control of pollutants from existing facilities and for new and reconstructed facilities. This BMP program includes development, construction, maintenance and evaluation of BMPs, and investigation of new BMPs. The goal of BMP implementation is to control the discharge of pollutants to the applicable standards.

While erosion control BMPs are typically used on construction sites, some are used as permanent, post-construction BMPs. Typical erosion control BMPs involve use of straw or fiber rolls and mats. These rolls and mats are often held together by synthetic mesh or netting. Synthetic materials are persistent in the environment and have been found to be a source of pollutants, trash (Brzozowski, 2009), and hazard to wildlife through entrapment (Brzozowski, 2009; Barton and Kinkead, 2005; Walley et al, 2005; Stuart et al, 2001). For erosion control products used as permanent, post-construction BMPs, this Order requires the use of biodegradable materials, and the removal of any temporary erosion control products containing synthetic materials when they are no longer needed. Biodegradable materials are required in erosion control products used by the Departments of Transportation in the states of Delaware and Iowa (Brzozowski, 2009). Use of synthetic (plastic) materials is also prohibited through a Standard Condition in Streambed Alteration Agreements by the California Department of Fish and Game, Region 1 (Van Hattem, personal communication, 2009).

Potential Unintended Public Health Concerns Associated with Structural BMPs

The Department worked collaboratively with the California Department of Public Health (CDPH) on a comprehensive, multi-component monitoring program of more than 120 structural BMPs for mosquito production (Department, 2004). The data revealed that certain BMPs may unintentionally create habitat suitable for mosquitoes and other vectors. The California Health and Safety Code prohibits landowners from knowingly providing habitat for or allowing the production of mosquitoes and other vectors, and gives local vector control agencies broad inspection and abatement powers. This Order requires the Department to comply with applicable provisions of the Health and Safety Code and to cooperate and coordinate with CDPH and local mosquito and vector control agencies on vector control issues in the Department's MS4.

Construction

The Department's construction activities were previously regulated under the MS4 permit (Order 99-06-DWQ), which required the Department to comply with the substantive provisions of the CGP but not the requirement to file separate notices of intent for each construction project. Some Regional Water Boards have had difficulty enforcing the provisions of the CGP when enrollment under that permit is not required. This Order requires the Department to file for separate coverage for each construction project under the

CGP. This change is expected to increase the Department's accountability for discharges from construction sites and improve the ability of the Regional Water Boards to take enforcement actions as necessary.

Though discharges from construction activities are not regulated under this Order, any discharges from a site occurring after completion of construction (i.e. post-construction discharges) are fully subject to the requirements of this Order.

Some Department construction-related activities such as roadway and parking lot repaving and resurfacing may mobilize pollutants, even though they may not trigger coverage under the CGP. Such activity may discharge pollutants to the environment, however. BMPs for the control of such discharges are specified in the Department's Project Planning and Design Guide and Construction Site BMP Field Manual and Trouble Shooting Guide, and in the California Stormwater Quality Association (CASQA) California Stormwater BMP Handbook (Department, 2010; Department, 2003a); (CASQA, 2009). The Department is required to implement BMPs to control such discharges.

Because some Department construction projects may not involve grading or land disturbance of one acre or more, these smaller projects do not trigger requirements to enroll under the Construction General Permit. This Order requires the Department to implement BMPs to control discharges from such projects to the MEP. Failure to implement appropriate BMPs is a violation of this Order.

Maintenance Program Activities

Preservation of vegetation is an effective method for the control of pollutants in runoff; however the Department must control vegetation in its rights-of-way for purposes of traffic safety and nuisance. The Department currently implements a vegetation control program with a stated purpose of minimizing the use of agricultural chemicals and maximizing the use of appropriate native and adapted vegetation for erosion control, filtering of runoff, and velocity control.

Notwithstanding the Department's commitment to reduce the use of agricultural chemicals, the Department reported a total amount of 208,549 pounds of herbicide used in the 2008-2009 Storm Water Management Program Annual Report (Department (2010a); CTSW-RT-10-182-32.1). Reported reasons for increased herbicide usage included:

1. Local weather conditions, such as increased rainfall, leading to increased weed production.
2. The need to address new mandates for fire suppression (fuel abatement) adjacent to roadways.
3. Requests from local cities and counties.
4. Increase in or outbreaks of noxious weeds in areas adjacent to farmland.

This Order contains detailed requirements for the control of vegetation and reporting requirements for the use of agricultural chemicals.

The Department's maintenance facilities discharge pollutants to the MS4. This Order requires the Department to prepare Facility Pollution Prevention Plans (FPPPs) for all maintenance facilities. The Department is also required to implement BMP programs at each facility as necessary and periodically inspect each facility.

Spill cleanup is part of the Department's maintenance program. This Order requires the Department to ensure that spills on its rights-of-way are fully and appropriately cleaned up, and to provide appropriate notifications to local municipalities which may be affected by the spill. The Department is also required to notify the appropriate Regional Water Board of any spill with the potential to impact receiving waters.

This Order requires the Department to monitor and clean storm drain inlets when they have reached 50 percent capacity. The Department must initiate procedures contained in an Illegal Connection/Illicit Discharge (IC/ID) and Illegal Dumping Response Plan where storm water structures are found to contain excessive material resulting from illegal dumping, and it must determine if enhanced BMPs are needed at the site.

This Order requires the Department to implement the BMPs and other requirements of the SWMP and this Order to reduce and eliminate IC/IDs. It also requires the Department to prepare a Storm Drain System Survey Plan and an Illegal Dumping Response Plan.

Facilities Operations

There is potential for the discharge of pollutants from Department facilities during rain events. The discharge of pollutants from facilities not covered by the IGP will be reduced to the MEP through the appropriate implementation of BMPs.

This Order requires the Department to file an NOI for coverage under the IGP for industrial facilities as specified in Attachment 1 of the IGP. This requirement is expected to increase the Department's accountability for discharges from industrial facilities and improve the ability of the Regional Water Boards to take enforcement actions as necessary.

Department Activities Outside the Department's Right-of-Way

Facilities and operations outside the Department's ROW may support various Department activities. Facilities may include concrete or asphalt batch plants, staging areas, concrete slurry processing or other material recycling operations, equipment and material storage yards, material borrow areas, and access roads. Facilities may be operated by the Department or by a third party. The Department is required to include provisions in its contracts that require the contractor to obtain and comply with applicable permits for facilities and operations outside the Department's ROW when these facilities are active for the primary purpose of accommodating Department activities.

Non-Department Projects and Activities

Non-Department projects and activities include construction projects or other activities conducted by a third party within the Department's ROW. The Department is responsible for runoff from all non-Department projects and activities in its rights-of-way unless a separate

permit is issued to the other entity. At times, local municipalities or private developers may undertake construction projects or other activities within the Department's ROW. The Department may exercise control or oversight over these third party projects or activities through encroachment permits or other means. This Order sets project planning and design requirements for non-Department projects.

Management Activities for Non-Storm Water Discharges

Non-storm water discharges are dry weather flows that do not originate from precipitation events. Non-storm water discharges are illicit discharges and are prohibited by the federal regulations (40 C.F.R., § 122.26 (d)(2)(iv)(B)(1)) unless exempted or separately permitted. Procedures for prohibiting illicit discharges and illegal connections, and for responding to illegal dumping and spills are needed to prevent environmental damage and must be described in the SWMP.

Training and Public Education

Education is an important element of municipal storm water runoff management programs. U.S. EPA (2005) finds that "An informed and knowledgeable community is crucial to the success of a storm water management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, [and] greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."

U.S. EPA also states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."

This Order requires the Department to implement a Training and Public Education program. The Training and Public Education program focuses on three audiences: Department employees, Department contractors, and the general public. The Department must implement programs for all three audiences. The Training and Public Education program is considered a BMP and an analysis of its effectiveness is needed.

Program Evaluation

This Order requires the Department to evaluate the effectiveness and adequacy of the storm water program on an annual basis. This includes both water quality monitoring and a self-audit of the program. The audit is intended to determine the effectiveness of the storm water and non-storm water programs through the evaluation of factors and program components such as:

1. Storm water and non-storm water discharges, including pollutant concentrations from locations representative of the Department's properties, facilities, and activities;
2. Maintenance activity control measures;
3. Facility pollution prevention plans;

4. Permanent control measures; and
5. Highway operation control measures.

In addition to water quality monitoring and the self-audit, the Department must perform an Overall Program Effectiveness Evaluation each year to determine the effectiveness of the program in achieving environmental and water quality objectives. The scope of the evaluation is expected to increase each year in response to the continuing collection of environmental monitoring data.

Reporting

Comprehensive reporting is needed to determine compliance with this Order and to track the effectiveness of the Department's storm water program over time. A summary of the reports required from the Department is presented in Attachment IX of the Order. The State Water Board and Regional Water Boards have the authority under various sections of the California Water Code to request additional information as needed.

The Department must track, assess and report on program implementation to ensure its effectiveness. In addition to the individual reports referenced above, the Department is required to submit an annual report to the State Water Board by October 1 of each year. The Annual Report must evaluate compliance with permit conditions, evaluate and assess the effectiveness of BMPs, summarize the results of the monitoring program, summarize the activities planned for the next reporting cycle, and, if necessary, propose changes to the SWMP.

Total Maximum Daily Loads (TMDL)

Section 303(d) of the Clean Water Act requires States to identify waters ("impaired" water bodies) that do not meet water quality standards after applying certain required technology-based effluent limits. States are required to compile this information in a list and submit the list to the U.S. EPA for review and approval. This list is known as the Section 303(d) list of impaired waters.

As part of the listing process, States are required to prioritize waters/watersheds for future development of TMDLs. A TMDL is defined as the sum of the individual waste load allocations (WLAs) for point sources of pollution, plus the load allocations (LAs) for nonpoint sources of pollution, plus the contribution from background sources of pollution and a margin of safety. The State Water Board and Regional Water Boards have ongoing efforts to monitor and assess water quality, to prepare the Section 303(d) list, and to subsequently develop TMDLs.

TMDLs are developed by either the Regional Water Boards or U.S. EPA in response to Section 303(d) listings. TMDLs developed by Regional Water Boards include implementation provisions and can be incorporated as Basin Plan amendments. TMDLs developed by U.S. EPA typically contain the total load and load allocations required by Section 303(d), but do not contain comprehensive implementation provisions. Subsequent

steps after Regional Water Board TMDL development are: approval by the State Water Board, approval by the Office of Administrative Law, and ultimately, approval by U.S. EPA.

The Department has been assigned mass based and concentration based WLAs for constituents contributing to a TMDL in specific regions. The Department is subject to TMDLs in the North Coast, San Francisco Bay, Central Coast, Los Angeles, Central Valley, Lahontan, Colorado River, Santa Ana, and San Diego Regions. These TMDLs are summarized in Table 1 of this Fact Sheet below, and Table IV.2 of Attachment IV of this Order.

Table 1. Department Statewide TMDLs

Water Body	Pollutant	U.S. EPA Approved/Established
<i>North Coast Region</i>		
Albion River *	Sediment	December 2001
Big River *	Sediment	December 2001
Lower Eel River *	Temperature & Sediment	December 18, 2007
Middle Fork Eel River *	Temperature & Sediment	December 2003
South Fork Eel River *	Sediment & Temperature	December 16, 1999
Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury) *	Sediment & Temperature	December 29, 2004
Garcia River	Sediment	March 16, 1998
Gualala River *	Sediment	November 29, 2004
Klamath River	Temperature, Dissolved Oxygen, Nutrient, & Microcystin	December 28, 2010
Lost River	Nitrogen and Biochemical Oxygen Demand	December 30, 2008
Mad River *	Sediment & Turbidity	December 21, 2007
Navarro River *	Temperature & Sediment	December 27, 2000
Noyo River *	Sediment	December 16, 1999
Redwood Creek *	Sediment	December 30, 1998
Scott River	Sediment and Temperature	August 11, 2006
Shasta River	Dissolved Oxygen & Temperature	January 26, 2007
Ten Mile River *	Sediment	December 2000

Water Body	Pollutant	U.S. EPA Approved/Established
Trinity River *	Sediment	December 20, 2001
South Fork Trinity River and Hayfork Creek *	Sediment	December 1998
Van Duzen River & Yager Creek *	Sediment	December 16, 1999
<i>San Francisco Bay Region</i>		
Napa River	Sediment	January 20, 2011
Richardson Bay	Pathogens	December 18, 2009
San Francisco Bay	PCBs	March 29, 2010
San Francisco Bay	Mercury	February 12, 2008
San Pedro and Pacifica State Beach	Bacteria	August 1, 2013
San Francisco Bay Urban Creeks	Diazinon & Pesticide-Related Toxicity	May 16, 2007
Sonoma Creek	Sediment	September 8, 2010
<i>Central Coast Region</i>		
San Lorenzo River (includes Carbonera Lompico, Shingle Mill Creeks)	Sediment	February 19, 2004
Morro Bay (includes Chorro Creek, Los Osos Creek, and the Morro Bay Estuary)	Sediment	January 20, 2004
<i>Los Angeles Region</i>		
Ballona Creek	Metals (Ag, Cd, Cu, Pb, & Zn) and Selenium	December 22, 2005 and reaffirmed on October 29, 2008
Ballona Creek	Trash	August 1, 2002 and February 8, 2005
Ballona Creek Estuary	Toxic Pollutants (Ag, Cd, Cu, Pb, Zn, Chlordane, DDTs, Total PCBs, and Total PAHs)	December 22, 2005
Ballona Creek, Ballona Estuary and Sepulveda Channel	Bacteria	March 26, 2007
Ballona Creek Wetlands *	Sediment and Invasive Exotic Vegetation	March 26, 2012
Calleguas Creek and its Tributaries and Mugu	Metals and Selenium	March 26, 2007

Water Body	Pollutant	U.S. EPA Approved/Established
Lagoon		
Calleguas Creek its Tributaries and Mugu Lagoon	Organochlorine Pesticides, Polychlorinated Biphenyls, and Siltation	March 14, 2006
Colorado Lagoon	Organochlorine Pesticides, Polychlorinated Biphenyls, Sediment Toxicity, Polycyclic Aromatic Hydrocarbons, and Metals	June 14, 2011
Dominguez Channel, Greater Los Angeles and Long Beach Harbor Waters	Toxic Pollutants: Metals (Cu, Pb, Zn), DDT, PAHs, and PCBs	March 23, 2012
Legg Lake	Trash	February 27, 2008
Long Beach City Beaches and Los Angeles & Long Beach Harbor Waters *	Indicator Bacteria	March 26, 2012
Los Angeles Area (Echo Park Lake) *	Nitrogen, Phosphorus, Chlordane, Dieldrin, PCBs, and Trash	March 26, 2012
Los Angeles Area (Lake Sherwood) *	Mercury	March 26, 2012
Los Angeles Area (North, Center, and Legg Lakes) *	Nitrogen and Phosphorus	March 26, 2012
Los Angeles Area (Peck Road Park Lake) *	Nitrogen, Phosphorus, Chlordane, DDT, Dieldrin, PCBs, and Trash	March 26, 2012
Los Angeles Area (Puddingstone Reservoir) *	Nitrogen, Phosphorus, Chlordane, DDT, PCBs, Hg, and Dieldrin	March 26, 2012
Los Angeles River and Tributaries	Metals	December 22, 2005 and October 29, 2008 & Reopened and Modified on November 3, 2011
Los Angeles River	Trash	July 24, 2008
Los Angeles River Watershed	Bacteria	March 23, 2012
Los Cerritos *	Metals	March 17, 2010
Machado Lake	Pesticides and Polychlorinated Biphenyls	March 20, 2012
Machado Lake	Trash	February 27, 2008

Water Body	Pollutant	U.S. EPA Approved/Established
Machado Lake	Eutrophic, Algae, Ammonia, and Odors (Nutrient)	March 11, 2009
Malibu Creek Watershed	Bacteria	January 10, 2006, Revised November 8, 2013**
Malibu Creek and Lagoon *	Sedimentation and Nutrients to Address Benthic Community Impairments	July 2, 2013
Malibu Creek Watershed	Trash	June 26, 2009
Marina del Rey Harbor	Toxic Pollutants	March 16, 2006
Marina del Rey, Harbor Back Basins, Mothers' Beach	Bacteria	March 18, 2004, Revised November 7, 2013**
Revolon Slough and Beardsley Wash	Trash	August 1, 2002 and February 8, 2005
San Gabriel River *	Metals (Cu, Pb, & Zn) and Selenium	March 26, 2007
Santa Clara River Estuary and Reaches 3, 5, 6, and 7	Coliform	January 13, 2012
Santa Clara River Reach 3 *	Chloride	June 18, 2003
Santa Monica Bay *	DDTs and PCBs	March 26, 2012
Santa Monica Bay Nearshore & Offshore	Debris (trash & plastic pellets)	March 20, 2012
Santa Monica Bay Beaches	Bacteria	June 19, 2003, Revised November 7, 2013**
Upper Santa Clara River	Chloride	April 6, 2010
Ventura River Estuary	Trash	February 27, 2008
Ventura River and its Tributaries	Algae, Eutrophic Conditions, and Nutrients	June 28, 2013
Central Valley Region		
Cache Creek, Bear Creek, Sulphur Creek and Harley Gulch	Mercury	February 7, 2007
Clear Lake	Nutrients	September 21, 2007
Sacramento – San Joaquin Delta	Methylmercury	October 20, 2011
Lahontan Region		

Water Body	Pollutant	U.S. EPA Approved/Established
Lake Tahoe	Sediment and Nutrients	August 16, 2011
Truckee River	Sediment	September 16, 2009
<i>Colorado River Region</i>		
Coachella Valley Storm Water Channel	Bacterial Indicators	April 27, 2012
<i>Santa Ana Region</i>		
Big Bear Lake	Nutrients for Hydrological Conditions	September 25, 2007
Lake Elsinore and Canyon Lake	Nutrients	September 30, 2005
Rhine Channel Area of the Lower Newport Bay *	Chromium and Mercury	June 14, 2002
San Diego Creek and New Port Bay, including the Rhine Channel *	Metals (Cadmium, Copper, Lead, & Zinc)	June 14, 2002
San Diego Creek and Upper Newport *	Cadmium	June 14, 2002
San Diego Creek Watershed	Organochlorine Compounds (DDT, Chlordane, PCBs, and Toxaphene)	November 12, 2013
Upper & Lower Newport Bay	Organochlorine Compounds (DDT, Chlordane, & PCBs)	November 12, 2013
<i>San Diego Region</i>		
Chollas Creek	Diazinon	November 3, 2003
Chollas Creek	Dissolved Copper, Lead, and Zinc	December 18, 2008
Rainbow Creek	Total Nitrogen and Total Phosphorus	March 22, 2006
Project 1 – Revised Twenty Beaches and Creek in the San Diego Region (Including Tecolote Creek)	Indicator Bacteria	June 22, 2011
* U.S. EPA Established TMDL		
** OAL Approved, U.S. EPA Approval Pending		

The TMDL-based requirements of this Order are not limited to the maximum extent practical (MEP) standard. The TMDL-based requirements have been imposed in accordance with 40 Code of Federal Regulations section 122.44(d)(1)(vii)(B). Pursuant to 40 Code of Federal Regulations section 122.44(d)(1)(vii)(B), the effluent limitations for NPDES permits must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA, or established by EPA. In addition, Water Code section 13263, subdivision (a), requires that waste discharge requirements implement

any relevant water quality control plans (basin plans), including TMDL requirements that have been incorporated into the basin plans.

Effluent limitations for NPDES-regulated storm water discharges that implement WLAs in TMDLs may be expressed in the form of best management practices (BMPs). (See 33 U.S.C. §1342(p)(3)(B)(iii); 40 C.F.R. §122.44(k)(2)&(3).) Where effluent limitations are expressed as BMPs, there should be adequate demonstration in the administrative record of the permit, including in the Fact Sheet, that the BMPs will be sufficient to comply with the WLAs.²⁰ (See 40 C.F.R. §§ 124.8, 124.9 & 124.18.) The NPDES permit must also specify the monitoring necessary to determine compliance with permit limitations. (See 40 C.F.R. § 122.44(i).) Where effluent limitations are specified as BMPs, the permit should also specify the monitoring necessary to assess if the expected load reductions attributed to BMP implementation are achieved (e.g., BMP performance data). The permit should additionally provide a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance.²¹

As detailed below, this Order establishes BMP-based requirements for TMDL implementation that are consistent with the requirements and assumptions of the relevant WLAs. This Order further requires implemented BMPs to be monitored for effectiveness and to be adaptively managed for modifications as necessary to achieve WLAs.

Overview

The State Water Board and Regional Water Boards have reviewed the WLAs, implementation requirements, and monitoring requirements specified in the adopted and approved Regional Water Board Basin Plans or in U.S. EPA-established TMDLs applicable to the Department. In most of the relevant TMDLs, the Department's contribution to impairment is a small portion of the overall contribution from multiple sources (less than five percent). While the Department is generally a small contributor to impairment, the statewide reach of its highway system means that it is a contributor in numerous impaired watersheds. The Department must comply with applicable TMDLs across the state.

The fact that one discharger – the Department – must implement requirements for over 84 TMDLs administered by nine Regional Water Boards poses a unique challenge in permitting. Many of the TMDLs are designed to address the same pollutants causing impairment, and progress in achievement of the WLA for these pollutant categories requires implementation of similar control measures coupled with monitoring and adaptive management. In past

²⁰ Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," Memorandum, U.S. EPA, November 22, 2002. On November 12, 2010, U.S. EPA issued a revision to the November 22, 2002, memorandum, recommending that "where the TMDL includes WLAs for storm water sources that provide numeric pollutant load or numeric surrogate pollutant parameter objectives, the WLA should, where feasible, be translated into numeric WQBELs in the applicable storm water permits." The revision further stated, however, that the permitting authority's decision as to how to express water quality based effluent limitations (WQBELs), i.e. as numeric effluent limitations or BMPs, would be based on an analysis of the specific facts and circumstances surrounding the permit.

²¹ *Ibid.*

regulatory actions, however, the Department has been directed to comply with the TMDL requirements by reference to the sections of the relevant basin plan and through coordination with the relevant Regional Water Board. As a result, the Department has devoted significant effort to coordination and exercises to determine the next steps, with limited progress in installing on-the-ground control measures to achieve actual water quality improvements. This Order provides a focused and streamlined process for TMDL compliance so that the Department may proceed as quickly as possible to installation of control measures and monitoring, and adaptive management of those control measures to result in water quality improvements. The Order's TMDL requirements provide consistency in determining compliance requirements, where appropriate. To allow for consistency, with resulting time and cost-efficiency, in achieving compliance with the TMDL requirements applicable to the Department, the State Water Board has developed a set of pollutant category requirements to be implemented by the Department.

The pollutant categories are as follows:

1. Sediment/Nutrients/Mercury/Siltation/Turbidity TMDLs
2. Metals/Toxics/Pesticides TMDLs
3. Trash TMDLs
4. Bacteria TMDLs
5. Diazinon TMDLs
6. Selenium TMDLs
7. Temperature TMDLs
8. Chloride TMDLs

Table IV.2 of Attachment IV of this Order lists all TMDLs applicable to the Department. For each TMDL, Table IV.2 cross-references one or more pollutant category. The Department must implement the cross-referenced pollutant category requirements to achieve compliance with the TMDL provisions of the Order. Where TMDL-specific, rather than, or in addition to, pollutant category-specific permit requirements are appropriate (because of the unique local conditions or specific requirements in the TMDL), those requirements are also noted in Table IV.2. In addition, Table IV.2 cross-references the monitoring, reporting and adaptive management requirements applicable to all pollutant categories.

Attachment IV of this Order recognizes that, because the Department must comply with numerous TMDLs, the Department must phase in implementation requirements for TMDLs over several years. To achieve the highest water quality benefit as quickly as feasible in the permit term, this phase-in must be accomplished in a manner that addresses discharges with the highest impact on water quality first. Accordingly, Attachment IV requires the Department, by October 1, 2014, to prepare and submit an inventory of all impaired reaches subject to TMDLs to which the Department discharges with prioritized implementation of controls for these reaches based on a set of qualitative criteria. In preparing the initial prioritization, the Department must consider the degree of impairment of the water body, measured by the percent pollution reduction needed to achieve the WLA, the contributing drainage area from the Department's right of way (ROW) relative to the watershed draining to the reach, and the relative proximity of the ROW to the receiving water.

The State Water Board will allow a 30-day public comment period on the Department's initial prioritization and will work with the Department and the Regional Water Boards to compile a final prioritization to be approved by the State Water Board Executive Director. Criteria for final prioritization to be considered by the Department, the State Water Board and Regional Water Boards include:

- a. Opportunities for synergistic benefits with existing or anticipated projects or activities within the reach, e.g., cooperative efforts with other dischargers or projects within an ASBS.
- b. Multiple TMDLs that can be addressed by a single BMP within a reach.
- c. TMDL deadlines specified in a Basin Plan.
- d. Regional Water Board and State Water Board priorities.
- e. Accessibility for construction and/or maintenance (i.e. safety considerations).
- f. Multi-benefit projects that provide benefits in addition to water quality improvement, such as groundwater recharge or habitat enhancement.

In finalizing the prioritization, the State Water Board and Regional Water Boards will consider the compliance date for attainment of the WLAs established in the Basin Plans and may adjust the prioritization accordingly. It is the intent of the State Water Board to have the Department meet listed TMDL deadlines where feasible.

Upon State Water Board Executive Director approval of final prioritization, the Department must implement control measures to achieve 1650 Compliance Units (CUs) per year. One CU is equivalent to one acre of the Department's ROW, from which the runoff is retained, treated, or otherwise controlled prior to discharge to the relevant reach. BMPs installed during construction activities in TMDL watersheds may receive CU credit for that portion of the treatment volume that exceeds the baseline treatment control requirements specified in the Order. A CU may be claimed when the BMP retrofit project enters the Project Initiation Document (PID) phase of implementation per the requirements of the Order. If a BMP retrofit project is not completed within the approved time schedule, the CU(s) will be revoked unless the Executive Director approves a delay.

The determination of the number of CUs the Department must complete each year is based on the objective of addressing every TMDL in Attachment IV within 20 years. A primary factor considered in the determination of the number of CUs to be completed each year is the compliance due date for the final WLA for many of the relevant TMDLs. The State Water Board considered two approaches in determining the annual number of CUs.

The first approach is based on a simple calculation of the number of acres of ROW that must be treated to ensure that all TMDL watersheds are addressed over a 20 year time frame. Data submitted by the Department indicate that there are 68,000 acres of ROW within TMDL watersheds.

It is not possible or necessary to treat 100 percent of the runoff from TMDL watersheds. In evaluating monitoring sites for discharges into ASBS, staff found that approximately 64

percent of the sites considered could not be addressed, either due to access limitations or safety considerations. Similar conditions are expected to exist in TMDL watersheds, although the percentage will not be as high because the terrain found along most of California's coastline is more difficult and rugged than the terrain that typically exists in the rest of the state. Accordingly, for purposes of this calculation based on the Department's preliminary estimates, the percentage of inaccessible/unsafe sites is reduced by one-half for TMDL watersheds, or 32 percent, translating into approximately 22,000 fewer acres ($68,000 \times 32 \text{ percent} = 22,000$) that must be treated. Therefore, the Department will have to address approximately 46,000 acres of ROW to comply with the TMDL requirements of Attachment IV. With the objective of addressing all TMDLs in Attachment IV within 20 years, the Department must treat or otherwise address 2300 acres per year ($46,000/20 = 2300$) throughout the state within the TMDL watersheds listed in Attachment IV.

The second approach for determination of CUs considered by the State Water Board is based on the Department's updated estimates of ROWs that must be treated. This proposal provided by the Department segregates the TMDLs into eight pollutant categories, similar to those presented in Attachment IV, including sediments, metals, trash and bacteria. The Department proposed annual CU commitments based upon the individual categories, with 600 CUs for sediments, a combined 710 CUs for metals and trash, and 340 CUs for bacteria, for an annual total of 1650 CUs. The proposal does not include other pollutant categories in which the acreage and controls for sediments, metals, trash, and bacteria would overlap with the acreage and controls for these other pollutants. This overlap of coverage was identified for the above categorical annual commitments so that the total ROW acreage requiring treatment equates to 33,000 acres.

Though the two approaches produce similar results, the State Water Board confirms that the second approach is sufficient for TMDL-implementation planning at the current stage of TMDL implementation; therefore the second compliance unit determination approach described above is implemented in this Order. The State Water Board believes that 1650 CUs represent a reasonable balance of resources and environmental protection, and will be sufficient to address the TMDLs in Attachment IV in the foreseeable future. The Department is ultimately responsible for demonstrating that it has complied with the TMDLs in Attachment IV by meeting the WLAs and other TMDL performance criteria, independent of its annual obligation to receive credit for compliance units. 1650 CUs per year may be more or less than is needed to comply with the TMDLs in Attachment IV within 20 years. This permit expires in 2018; therefore Attachment IV of this Order requires the Department to present to the State Water Board, at a public meeting to be scheduled approximately 180 days prior to the expiration of the Order, a TMDL Progress Report containing an evaluation of the progress achieved during this permit term. The State Water Board will then evaluate the compliance unit approach and the Department's progress in meeting the 20 year objective before consideration of subsequent requirements in a subsequently renewed permit.

Using an average cost \$176,000 per BMP/acre²², the proposed annual cost to meet this requirement relying solely on retrofits is approximately \$290,000,000. The Department's contribution to impairment in any given TMDL is generally a small portion of the overall contribution from multiple sources. In many cases, synergistic effects can be achieved and water quality improvements are better served through coordinated efforts with other parties to the TMDL. To encourage collaborative implementation, Attachment IV of this Order allows CUs for collaborative efforts based on the amount of financial participation made by the Department. To determine an appropriate financial equivalence staff used the cost data submitted by the Department of \$176,000 per BMP/acre or per CU. However, to encourage collaborative efforts, staff proposes a 50 percent discount for participation in these types of agreements. Attachment IV accordingly sets the CU equivalent at \$88,000. Based on the same approach described above, and relying solely on contributions to collaborative efforts, the annual cost to the Department is approximately \$145,000,000.

Attachment IV allows for two types of collaborative implementation: Cooperative Implementation Agreements between the Department and other responsible parties to conduct work to comply with a TMDL, and a Cooperative Implementation Grant Program funded by the Department and administered by the State Water Board. The grant program will be used to fund capital projects in impaired watersheds in which the Department has been assigned a WLA or otherwise has responsibility for implementation of the TMDL. Cooperative implementation will satisfy some or all of the Department's obligations under a TMDL, whether or not discharges from the Department's ROW are controlled or treated.

Cooperative implementation has the following advantages:

- Allows for retrofit projects off the ROW, at locations that may otherwise have space, access, or safety limitations within the ROW;
- Provides for the involvement of local watershed partners who have an interest and expertise in the best way to protect, manage, and enhance water quality in the watershed;
- Allows for implementation of BMPs and other creative solutions not typically available to the Department;
- Allows for larger watershed scale projects; and
- Leverages resources from other entities.

In addition, the Cooperative Implementation Grant Program eliminates the Department's complex budgeting and project approval process to expedite the implementation of BMPs in impaired watersheds.

If the Department elects to fund a Cooperative Implementation Grant Program, the Department and the State Water Board will enter into a formal agreement to specify the terms of the grant program and the commitments and responsibilities of the parties. The agreement will specify the following:

²² Construction capital cost based on information provided by Department staff.

- The Department will pay all State Water Board costs in administering the grant program. No credit for compliance units will be given for administrative costs paid to the State Water Board.
- The Department will track and report on the projects funded under the grant program.
- Grantees will be responsible for the long term management, operation, and maintenance of BMPs.
- Grants are limited to other responsible parties named in the TMDL.
- Projects shall address storm water runoff and treat or control the same Pollutants of Concern that the Department is responsible for.
- Priority is given to projects that address impairments in the highest priority reaches identified in the prioritization process specified in Attachment IV, Section I.A.
- If the grant program is discontinued, any unexpended funds will be returned to the Department and the corresponding compliance units will be revoked and added to subsequent annual compliance unit totals.

Attachment IV reflects the State Water Board's commitment to streamlining TMDL compliance for the Department to proceed as quickly as feasible to implement on-the-ground control measures and obtain measurable improvement in water quality. In the prioritization process, the Department and the Water Boards will consider the final compliance deadlines under the TMDLs; however, the State Water Board recognizes that the requirements in Attachment IV do not mirror all specific interim deadlines for studies, reports, and pollutant reductions in the TMDLs included to demonstrate progress toward meeting the WLAs. The requirements in Attachment IV are general yet consistent with specific planning, study, and reporting requirements in the TMDLs.

The Department is required annually to include in the TMDL Status Review Report its proposal for reaches to be addressed in the upcoming year, with selected control measures and projected schedule for implementation. The Department is also required to report a set of information that encompasses updates on cooperative and individual implementation activities completed, as well as an analysis of the effectiveness of existing BMPs and activities in meeting the WLAs. This information will be reviewed by the State Water Board and will be publicly available. Control measures and implementation schedules proposed for the upcoming year are subject to the approval of the Executive Director, or designee.

Attachment IV does not list the final required WLAs for each TMDL. With few exceptions, the WLAs are to be achieved jointly by a number of storm water dischargers and accordingly are of limited use in determining and enforcing the Department's specific responsibilities under the TMDL. The State Water Board finds that effective implementation and enforcement of Attachment IV is better achieved through clear requirements for implementation of controls, and monitoring and adaptive management of such controls, than by implementation of joint WLAs into the permit requirements.

Nevertheless, the WLAs, both Department-specific and joint with other dischargers, are discussed in the sections below. While the WLAs are not incorporated into Attachment IV as permit requirements, the discussion establishes that Attachment IV is consistent with the

requirements and assumptions of the WLAs. In general, the Department is a relatively small contributor to the impairment to be addressed by the relevant TMDLs.²³ Attachment IV requires a focused effort to address the priority discharges through measurable and streamlined progress in implementation of controls, effectively addressing the relatively small contribution from the Department. The Department must verify progress through reporting of subsequent monitoring and adaptive management activities.

As an additional step in determining compliance toward achievement of WLAs, the Department must submit a TMDL Progress Report with its application for permit reissuance in January of 2018, analyzing the effectiveness of the control measures installed for each reach and whether the control measures have been or will be sufficient to achieve WLAs and other performance standards by the final TMDL compliance deadlines. The TMDL Progress Report will be subject to public review and comment and will inform the State Water Board as it considers subsequent requirements in a subsequently reissued permit.

A. General Requirements for all TMDLs: Comprehensive TMDL Monitoring, Reporting, and Adaptive Management

As previously discussed, an NPDES permit must specify the monitoring necessary to determine compliance with effluent limitations. Where effluent limitations are specified as BMPs, the permit should specify the monitoring necessary to assess if the expected load reductions attributed to BMP implementation are achieved. The permit should additionally provide a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance. Attachment IV requires continuation of existing monitoring plans as approved by the Regional Water Board Executive Officer. Where there is no approved monitoring plan in place for a TMDL, the Department is required to submit a plan to the State Water Board by January 1, 2015, with a time schedule to implement the plan. The submitted plan must be designed to assess the effectiveness of implemented BMPs and to inform BMP selection. The Department shall use the monitoring data to conduct an on-going assessment of the performance and effectiveness of BMPs and shall use the assessment to inform modifications to control measures to achieve WLAs and other applicable performance standards.

BMP effectiveness monitoring and the adaptive management strategy related to BMP implementation allows for flexibility in source control methods until the most appropriate BMPs are identified and installed for the control of a pollutant. The Department will evaluate the effectiveness of the controls that were implemented each year and submit the results of the evaluation in the TMDL Status Review Report, which is submitted as part of the Annual Report. If the controls implemented are shown to be ineffective, then the Department must either re-design the BMP or implement a new type of control measure to address the inadequacies of the current design. The process of assessing the performance and

²³ In the few instances where the Department's contribution is a relatively high percentage of the total contribution from identified sources, as identified in this Fact Sheet, the State Water Board would expect the Department to prioritize addressing such discharges and evaluating the performance and effectiveness of the selected BMPs.

effectiveness of BMPs and using that assessment to modify or replace inadequate BMPs ensures that the Department will make progress toward achieving the requirements of the TMDLs within the permit term.

The Department must also prepare and submit a TMDL Progress Report to the State Water Board as part of its permit reissuance application. That report must include: (1) a summary of the effectiveness of the control measures installed for each reach that has been addressed, as a result of BMP effectiveness assessment, (2) a determination as to whether the control measures have been or will be sufficient to achieve WLAs and other performance standards by the final compliance deadlines, (3) where the control measures are determined not to be sufficient to achieve WLAs or other performance standards by the final compliance deadlines, a proposal for improved control measures to address the relevant pollutants, and (4) a summary of the estimated amount of pollutants that were prevented from entering into the receiving waters. The TMDL Progress Report will be subject to public review and comment and will inform the requirements of the reissued permit.

B. Sediments/Nutrients/Mercury/Siltation/Turbidity Pollutant Category

General Description of Pollutant Category

The TMDLs in this pollutant category identify sediment from roads as a significant or primary source of these pollutants. Excessive sediment loads have resulted in the non-attainment of water quality objectives for sediment, suspended material, and settleable material. Excess sediment delivery to stream channels is associated with several natural processes as well as anthropogenic sources.

Sources of Pollutant and How Pollutants Enters the Waterway

Natural sources include geologically unstable areas that are subject to landslides, as well as smaller sediment sources such as gullies and stream-bank failures. Anthropogenic sources include road-related stream crossing failures, gullies, fill failures, and landslides precipitated by road-related surface erosion and cut bank failures. Road-related activities which can increase sediment discharge to a waterway include the construction and maintenance of paved and unpaved roadways, watercourse crossing construction, reconstruction, maintenance, use, and obliteration, and many activities conducted on unstable slopes. Unstable areas are areas with a naturally high risk of erosion and areas or sites that will not reasonably respond to efforts to prevent, restore or mitigate sediment discharges. Unstable areas are characterized by slide areas, gullies, eroding stream banks, or unstable soils that are capable of delivering sediment to a watercourse. Slide areas include shallow and deep seated landslides, debris flows, debris slides, debris torrents, earthflows, headwall swales, inner gorges and hummocky ground. Unstable soils include unconsolidated, non-cohesive soils and colluvial debris.

Mercury is negatively impacting the beneficial uses of many waters of the state. As of 2010, more than 180 water bodies are designated as impaired by mercury, and fish in these waters can have mercury concentrations that pose a health risk for humans and wildlife that eat the fish, including threatened and endangered species. The beneficial uses impacted by

mercury include, but may not be limited to, COMM, WILD, and RARE beneficial uses. Also REC-1 has been used for many waters to indicate fish consumption as part of fishing. Sources of mercury include gold and mercury mines, naturally mercury enriched soils, atmospheric deposition, improper disposal of mercury containing items, such as batteries and dental amalgam. Mercury from many of these sources can end up in storm water and industrial and municipal wastewater.

Watershed Contribution

The Department is a relatively minor source of pollutants and small percentage of the watershed. The Department will address the highest problem areas and therefore, addressing the problem at the appropriate level for the Sediment, Nutrients, Mercury, Siltation and Turbidity TMDLs.

Control Measures

Attachment IV requires the Department to implement control measures to prevent erosion and sediment discharge. The measures that control the discharge of sediment can be effective in controlling releases of nutrients and mercury. This can be achieved by protecting hillsides, intercepting and filtering runoff, avoiding concentrated flows in natural channels and drains, and not modifying natural runoff flow patterns.

In addition to TMDL requirements, the Department has developed a BMP program for control of pollutants from existing facilities and for new and reconstructed facilities. This BMP program includes implementation, maintenance and evaluation of BMPs, and the investigation of new BMPs. The goal of BMP implementation is to control the discharge of pollutants to achieve the applicable standards. Erosion control BMPs are typically used on construction sites, although some are also used as permanent, post-construction BMPs.

Department's Contribution

The Department's discharge contribution is discussed under the individual TMDLs below. The TMDLs in this pollutant category attribute most anthropogenic sediment related beneficial use impairments to logging activities and, to a lesser degree, some agricultural activities. Logging activities routinely include extensive construction and maintenance of unpaved roads which range over large areas, whereas the Department maintains a network of paved highways which account for a small fraction of the total area devoted to all paved roadways within the boundaries of these TMDLs.

The requirements in Attachment IV are generally sufficient to address the sediment TMDLs that originate from a comparatively minor pollutant source, and this is accomplished by focusing on the most problematic areas and activities within this relatively low-volume subset of anthropogenic discharges for this pollutant category.

NORTH COAST REGION SEDIMENT TMDLS

As discussed under individual TMDLs below, the TMDLs in this pollutant category attribute most anthropogenic sediment-related beneficial use impairments to logging activities and, to a lesser degree, some agricultural activities. Logging activities in the North Coast region routinely include extensive construction and maintenance of unpaved roads which range over large areas of the Coast Range’s vertical topography, whereas the Department maintains a network of paved highways which accounts for a small fraction of the total area devoted to all paved roadways within the boundaries of these TMDLs.

WLAS

The North Coast Regional Water Board has adopted the “Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters in the North Coast Region” on November 29, 2004. The goals of the Policy are to control sediment waste discharges to impaired water bodies so that the TMDLs are met, sediment water quality objectives are attained, and beneficial uses are no longer adversely affected by sediment. This policy requires the use of NPDES permits and waste discharge requirements to achieve compliance with sediment-related water quality standards.

The sediment control requirements in Attachment IV (TMDL Requirements) of this Order are intended to reduce the adverse impacts of excessive sediment discharges to sediment-impaired waters, including impacts to the cold water salmonid fishery and the COLD, COMM, RARE, SPWN, and MIGR beneficial uses. The beneficial uses associated with the cold water salmonids fishery are often the most sensitive to sediment discharges. The North Coast Regional Water Board’s basin plan has the following narrative water quality objectives which apply to sediment-related discharges to receiving waterbodies:

Parameter	Water Quality Objectives
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affects beneficial uses.
Settleable Material	Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.
Sediment	The suspended sediment load and suspended sediment discharge rate of surface water shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Turbidity	Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

Department’s Contribution:

The Department’s specific discharge contribution is discussed under the individual TMDLs below.

Albion River Sediment TMDL, December 2001

Final WLA

U.S. EPA states that there are no significant individual point sources of sediment in the Albion River watershed.

Final WLA Specific to the Department

U.S. EPA states that there are no significant individual point sources of sediment in the Albion River watershed. As a consequence, its wasteload allocation is set to zero.

Final Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Contribution (relative contribution to pollutant loading)

Approximately five percent of the total miles of roads within the watershed are paved, whereas logging road construction, logging road usage, and other activities associated with logging operations constitute the majority of anthropogenic sediment discharges. The Department's paved roadways thus constitute some undetermined fraction of the total paved road mileage: its wasteload allocation is set to zero.

Big River Sediment TMDL, December 2001

Final WLA

U.S. EPA states that there are no significant individual point sources of sediment in the Big River watershed, so the wasteload allocation is zero.

Final WLA Specific to the Department

U.S. EPA states that there are no significant individual point sources of sediment in the Big River watershed.

Final Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Contribution (relative contribution to pollutant loading)

Approximately three (3) percent of the miles of roadways within the watershed are paved, whereas logging road construction, logging road usage, and other activities associated with logging operations constitute the majority of anthropogenic sediment discharges. The Department is not listed as a source of point source discharges of sediment.

Lower Eel River Sediment & Temperature TMDL, December 18, 2007

Final Sediment WLA

For the Department’s facilities, construction sites, and municipalities, the wasteload allocation is expressed as equivalent to the load allocations, as specified in the following table:

Sediment Source		Average Daily		Average Daily		Percent Reduction 1955 -2003
		1955 – 2003 Loading	Load Allocation	1955 – 2003 Loading	Load Allocation	
		(tons/mi ² /yr)	(tons/mi ² /yr)	(tons/mi ² /day)	(tons/mi ² /day)	
Natural Load Allocation		718	718	2.0	2.0	0%
Roads	Episodic	43	9	0.1	0.02	80%
	Chronic	115	17	0.3	0.05	85%
Timber Harvest		590	147	1.6	0.4	75%
Skid Trail		7	1	0.02	0.5	90%
Bank Erosion		21	6	0.1	0.03	70%
Total Human-related Load Allocation		775	180	2.1	0.5	77%
Total Load Allocations Natural and Human-Related Sources		1,493	898	4.1	2.5	

Final WLA Specific to the Department

As stated above, U.S. EPA’s wasteload allocation for the temperature TMDL assigned to the Department and other point source dischargers is zero net increase in receiving water temperature.

Final Deadlines

As noted above, U.S. EPA did not set a specific sediment WLA for the Department.

Department’s Contribution (relative contribution to pollutant loading)

The Department’s relative sediment contribution is not known.

Eel River (Middle-Fork) Eden Valley and Round Valley HSAs Temperature and Sediment TMDL, December 2003

Final Sediment WLA

U.S. EPA states that because discharge from point sources cannot be readily determined, and because possible loading from point sources is not distinguished from general management-related loading in the source analysis, U.S. EPA considers the rates set as load allocations (i.e., for nonpoint sources) to also represent wasteload allocations (i.e., for those point sources that would be covered by general NPDES permits).

Table 7: Sediment TMDLs and Allocation (t/mi²/yr)

Source	Black Butte	Elk Creek	Round Valley	Upper MF	Williams Thatcher	BASINWIDE Load
TOTAL Natural	724	1,059	374	410	417	574
Percent Reduction over current	0%	0%	0%	0%	0%	0%
Subtotals Landslides	9	12	10	2	2	6
Percent Reduction over current	0%	5%	5%	0%	5%	5%
Subtotal Small Management Sources	7	41	9	8	19	23
Percent Reduction over current	0%	32%	95%	0%	89%	70%
Total Management-Related	16	53	19	10	21	29
Percent Reduction over current	0%	27%	91%	0%	88%	65%
TMDL – ALL SOURCES	740	1,112	393	420	438	603
Percent Reduction over current	0%	2%	32%	0%	26%	8%
Percent Natural	98%	95%	95%	98%	95%	95%
Percent Management	2%	5%	5%	2%	5%	5%

Final Sediment WLA Specific to the Department

As discussed above, U.S. EPA did not assign a specific sediment WLA to the Department.

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Sediment Contribution (relative contribution to pollutant loading)

U.S. EPA states that the Department's discharges of sediment, like other point sources of anthropogenic sediment discharges in this TMDL, are comparatively minor sources of this pollutant.

South Fork Eel River Temperature & Sediment TMDL, December 16, 1999

U.S. EPA's source analysis indicates that the sediment loading due to nonpoint erosion from roads and other anthropogenic activities accounts for a substantial portion of the total sediment loading in this watershed.

The waste load allocation for point sources are for sediment only, i.e., they are not directly related to the temperature portion of the TMDL, nor does U.S. EPA set a waste load allocation for point sources under the temperature portion of the TMDL. However, U.S. EPA also states that any improvements in stream temperature from reduced sedimentation contribute to the cumulative benefits of both sediment and temperature load reductions, and this assumption is accommodated in U.S. EPA's calculations for the margin of safety in this TMDL.

Final Sediment WLA

U.S. EPA set the wasteload allocation to zero because it found that there are no point sources of sediment in this watershed.

Final Sediment WLA Specific to the Department

As stated above, U.S. EPA states that there are no point source discharges of sediment within this TMDL, so the Department's wasteload allocation is set to zero.

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Sediment Contribution (relative contribution to pollutant loading)

U.S. EPA states that there are no discharges from point sources within this TMDL, and because of this finding, the Department's potential contribution to anthropogenic sediment loading is insignificant.

Upper Main Eel River Temperature & Sediment TMDL, December 29, 2004

Final Sediment WLA

For the sediment TMDL, U.S. EPA states that point sources are not significant, and sets the waste load allocation to zero.

Final Sediment WLA Specific to the Department

U.S. EPA views point source contributions to sediment loading in this TMDL, so the Department's wasteload allocation is set to zero.

Final Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Sediment Contribution (relative contribution to pollutant loading)

U.S. EPA considers all point sources of anthropogenic sediment loading to be insignificant for purposes of this TMDL.

Garcia River Sediment & Temperature TMDL, March 16, 1998**Final Sediment WLA**

The wasteload allocation is effectively set to zero for "controllable" anthropogenic discharges of sediment, including those associated with roads, since all controllable discharges of sediment from roadways are prohibited.

Final Sediment WLA Specific to the Department

Although not specifically included in this TMDL, the wasteload allocation for all "controllable" anthropogenic discharges of sediment from roadways is effectively set to zero.

Final Sediment Deadlines

The structure of this 2002 TMDL requires responsible parties to choose an option for controlling 'sediment delivery', and some 'due dates' have already passed, e.g., January 2005 was the deadline for the Long Term Road System Plan- it is unclear which option, if any, has been selected by the Department.

Department's Sediment Contribution (relative contribution to pollutant loading)

The Department's relative sediment pollutant loading is not known.

Gualala River Sediment & Temperature TMDL, November 29, 2004**Final Sediment WLA**

U.S. EPA set the wasteload allocation for sediment discharges to zero, noting that point sources of sediment pollution are insignificant within the area described in this TMDL.

Final Sediment WLA Specific to the Department

There is no wasteload allocation specifically assigned to the Department, but as mentioned above, U.S. EPA set these to zero because of their comparative insignificance as sources.

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Sediment Contribution (relative contribution to pollutant loading)

Approximately three percent of the miles of roadways included within this TMDL are paved. The Department's potential contribution to pollutant loading is some unspecified fraction of the former, whereas logging road construction, logging road usage, and other activities associated with logging operations constitute the majority of anthropogenic sediment discharges. Due to its relative insignificance as a source of sediment pollution the Department's wasteload allocation is set to zero.

Klamath River in California Temperature, Dissolved Oxygen, Nutrients, and Microcystin TMDL, December 28, 2010
Final Nutrients WLA

Daily mass-based nutrient (total phosphorus and total nitrogen) and organic matter load allocations are assigned to segments of the Klamath River and its tributaries.

Source Area	Daily TP Load Allocations (lbs/day)	Daily TN Load Allocations (lbs/day)
Stateline	245+	3,139+
Upstream of Copco 1 Reservoir	(61)+	(330)+
Stateline to Iron Gate Dam inputs	22+	339+
Δ Iron Gate Hatchery	0+	0+
Tributaries between Iron Gate Dam and the Shasta River	49+	317+
Shasta River	75+	220+
Tributaries between Shasta River and Scott River	17+	97+
Scott River	87+	1,279+
Tributaries between Scott River and Salmon River	187+	1,050+
Salmon River	193+	1,583+
Tributaries between Salmon River and Trinity River	90+	504+
Trinity River	762+	5,783+
Tributaries between Trinity River and Turwar Creek	179+	1,004+
Total Maximum Daily Load	1,845	14,985

Final Nutrients WLA Specific to the Department

There are no WLAs that are assigned specifically to the Department. The Department is expected to address nutrient inputs into the Klamath River watershed through control of sediment from its road and highway facilities.

Final Nutrients Deadlines

There are no final deadlines for achievement of WLAs. However, the Department shall submit annual reports to the North Coast Regional Water Board documenting progress in implementing.

Department's Nutrients Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the nutrient pollutant loading is not known.

Lost River Nitrogen Biochemical Oxygen Demand to address Dissolved Oxygen and pH Impairments December 30, 2008

The Lower Lost River TMDL was developed by the North Coast Regional Water Quality Control Board and approved by U.S. Environmental Protection Agency (U.S. EPA) (regional board resolution number R1-2010-0026). It established TMDLs for Nitrogen and Biochemical Oxygen Demand to address Dissolved Oxygen and pH Impairments. The Lower Lost River TMDLs implementation plan which was established by U.S. EPA is included in the Klamath River TMDL. Both the Klamath River TMDL and the Lower Lost River TMDL were both approved on December 28, 2010.

Final Nitrogen WLAs

Segment	Total Dissolved Inorganic Nitrogen WLA (average kg/day)	Total Carbonaceous Biochemical Oxygen Demand (CBOD) (average kg/day)
Lost River from Border of Tule Lake Refuge	79.5	197.0
Tule Lake Refuge TMDLs	181.5	90.10
Lower Klamath Refuge TMDLs	76.2	889.9

Final Nitrogen WLAs Specific to the Department

Segment	Dissolved inorganic nitrogen, (average kg/day)	Carbonaceous Biochemical Oxygen Demand (CBOD) (average kg/day)
Lost River from border of Tule Lake Refuge	0.3	0.5
Tule Lake Refuge TMDLs	0.3	0.5
Lower Klamath Refuge TMDLs	0.3	0.5

Final Nitrogen Deadlines

There are no deadlines associated with these TMDLs.

Department's Nitrogen Contribution (relative contribution to pollutant loading)

Segment	Percentage of Total Dissolved Inorganic Nitrogen WLA	Percentage of Total Carbonaceous Biochemical Oxygen Demand (CBOD) WLA
Lost River from border of Tule Lake Refuge	100	100
Tule Lake Refuge TMDLs	3.0	10.1
Lower Klamath Refuge TMDLs	100	100

Mad River Sediment and Turbidity TMDL, December 21, 2007

U.S. EPA states that almost all sources of sediment in the Mad River watershed are from diffuse, nonpoint sources, including runoff from roads, timber operations, and natural background. In the Mad River basin, individual point sources are negligible sources of sediment and suspended sediment. To ensure protection of the cold water beneficial use, EPA has determined that it is appropriate to consider the rates set forth in these TMDLs as load allocations to also represent wasteload allocations for the *diffuse* discharges in the watershed that are subject to NPDES permits, as discussed below.

Final WLAs for Sediment and Turbidity

Wasteload allocations for diffuse, permitted point sources function similarly to and are represented by the nonpoint source load allocations, and wasteload allocations for permitted point sources are provided concentration-based wasteload allocations equivalent to what is included in the permits in order to account for incidental sediment and suspended sediment discharges. The TMDLs for sediment and turbidity include separate but identical load allocations for nonpoint sources and wasteload allocations for the diffuse point sources for each subarea. These WLAs are equivalent to and represented by the LAs, and the LAs are expressed on a unit loading basis (tons/mi²/year); therefore, they are not added to the LAs in the TMDL equation.

Table 20. Total Sediment Load Allocations Summary for the Mad River Watershed

Sediment Source	Average Annual		Average Daily		Percent Reduction over 1976 – 2006 Period
	1976 – 2006 Loading (tons/mi ² /yr)	Load Allocation (tons/mi ² /yr)	1976 – 2006 Loading (tons/mi ² /yr)	Load Allocation (tons/mi ² /yr)	
Natural Load Allocation	894	894	2.4	2.4	0%
Roads	Landslides	1,298			
	Surface	242			
Roads Subtotal	1,540	174	4.2	0.5	89%
Harvest	Landslide	38			
	Surface	2			

Sediment Source	Average Annual		Average Daily		Percent Reduction over 1976 – 2006 Period
	1976 – 2006 Loading (tons/mi ² /yr)	Load Allocation (tons/mi ² /yr)	1976 – 2006 Loading (tons/mi ² /yr)	Load Allocation (tons/mi ² /yr)	
Harvest Subtotal	40	5	0.1	0.01	89%
Total Human-related Load	1,580	179	4.3	0.5	89%
Total Load: All Sources	2,474	1,073	6.8	2.9	57%
Note: values have been rounded.					

Suspended sediment is estimated as a proportion of total sediment load, and the reductions for the suspended sediment load are shown in Table 21 (below). The reductions reflect similar priorities as for the total sediment load. Suspended sediment is estimated as a proportion of total sediment load, and the reductions for the suspended sediment load are shown in Table 21. The reductions reflect similar priorities as for the total sediment load.

Table 21. Suspended Sediment Load Allocations Summary for the Mad River Watershed

Sediment Source		Average Annual		Average Daily		Percent Reduction over 1976 – 2006 Period
		1976 – 2006 Loading (tons/mi ² /yr)	Load Allocation (tons/mi ² /yr)	1976 – 2006 Loading (tons/mi ² /yr)	Load Allocation (tons/mi ² /yr)	
Natural Load Allocation		809	809	2.2	2.2	0 %
Road	Landslides	1,174				
	Surface	219				
Roads Subtotal		1,393	158	3.8	0.4	89%
Harvest	Landslides	34				
	Surface	2				
Harvest Subtotal		36	4	0.1	0.01	89%
Total Human-related Load		1,430	162	3.9	0.4	89%
Total Load: All Sources		2,238	971	6.1	2.7	57%

Final WLAs for Sediment and Turbidity Specific to the Department

U.S. EPA grouped the Department’s discharges under its NPDES municipal storm water permit with other “diffuse” NPDES-permitted storm water discharges occurring in this TMDL. U.S. EPA’s source analysis did not distinguish between land areas subject to NPDES regulation and nonpoint sources of sediment and turbidity. U.S. EPA’s TMDLs thus include separate but identical load allocations (LAs) for nonpoint sources and wasteload allocations (WLAs) for the “diffuse” point sources for each subarea. These WLAs are equivalent to and

represented by the LAs, and the LAs are expressed on a unit loading basis (tons/mi²/year); therefore, they are not added to the LAs in the TMDL equation.

For the diffuse permitted sources such as the Department's discharges under its municipal storm water permit, the waste load allocation is expressed as equivalent to the load allocation for (all) roads. The load allocations for roads are listed in the tables given above.

U.S. EPA also states that the Regional Water Board may wish to refine these TMDLs and allocations further in the future.

Final Sediment and Turbidity Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Sediment and Turbidity Contribution

U.S. EPA states that non-NPDES nonpoint sources are responsible for nearly all sediment loading in the watershed, but does not estimate the Department's potential contribution to sediment and turbidity waste loading in this TMDL. Only six percent of the roads in this watershed are paved, and some unspecified portions of the latter are State highways.

Navarro River Sediment and Temperature TMDL, December 27, 2000

Final Sediment WLA

The Navarro River TMDLs for temperature and sediment are based on separate analyses. Reduced sediment loads could be expected to lead to increased frequency and depth of pools, and to reduced wetted channel width/depth ratios.

Final Sediment WLA Specific to the Department

The Department is not specifically mentioned as a source of pollutant loading for temperature and sediment, nor are any other point sources of these pollutants. The wasteload allocation for the Department is therefore presumed to be set to zero.

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation of this TMDL.

Department's Sediment Contribution

As mentioned above, neither Department nor other point sources are identified as sources of pollutant loading for temperature or sediment, so U.S. EPA has determined that these potential sources are insignificant in this TMDL.

Noyo River Sediment TMDL, December 16, 1999

Final Sediment WLA

U.S. EPA apportioned the total load among several non-point sources of sediment, after accounting for background load. As a consequence, this TMDL does not include wasteload allocations for point sources.

Final Sediment WLA Specific to the Department

U.S. EPA did not specify deadlines for implementation of this TMDL.

Department's Sediment Contribution (relative to pollutant loading)

As stated above, U.S. EPA did not establish wasteload allocations for point sources of sediment.

Redwood Creek Sediment TMDL, U.S. EPA Established December 30, 1998

Final Sediment WLA

U.S. EPA did not establish wasteload allocations for point sources in this TMDL.

Final WLA

U.S. EPA established this TMDL on December 30, 1998 and it became effective immediately.

Final WLA Specific to the Department and the Department's Contribution

As stated above, U.S. EPA did not establish wasteload allocations for point sources of sediment.

Final Deadlines

U.S. EPA did not specify deadlines for implementation of this TMDL.

Department's Contribution (relative to pollutant loading)

The Department's contribution relative sediment pollutant loading is not known.

Scott River Sediment and Temperature TMDL, August 11, 2006

Final Sediment WLA

U.S. EPA states that there are no point sources of sediment and/or temperature related discharges within the area encompassed by this TMDL, so the wasteload allocation is set to zero.

Final Sediment WLA Specific to the Department

None.

Final Sediment Deadlines

U.S. EPA directed Regional Water Board staff to evaluate the Department's state-wide NPDES permit in the North Coast Region by September 8, 2008. The purpose of the evaluation was to determine the adequacy and effectiveness of the Department's storm water program in preventing and reducing elevated water temperatures in the North Coast Region, including the Scott River watershed.

Department's Sediment Contribution (relative to pollutant loading)

As noted above, U.S. EPA did not establish specific wasteload allocations for point sources, so the wasteload allocations are set to zero. The Department's point source contribution is therefore judged to be insignificant.

Ten Mile River Sediment TMDL, December 2000

Final Sediment WLA

U.S. EPA states that there are no point sources of sediment discharges within the area included within this TMDL: wasteload allocations are therefore set to zero.

Final Sediment WLA Specific to the Department

As stated above, U.S. EPA did not establish wasteload allocations for point sources such as the Department in this TMDL, so the wasteload allocations are set to zero.

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation of this TMDL.

Department's Sediment Contribution (relative pollutant loading)

The Department's relative sediment contribution is judged to be insignificant.

Trinity River Sediment TMDL, December 20, 2001

Final Sediment WLA

U.S. EPA did not subdivide waste load and load allocations into specific sources such as roads and timber harvest, unlike several of its other sediment-related TMDLs in Region 1. U.S. EPA divided the basin into subareas because of the wide range of sediment delivery rates within each of the several subareas. U.S. EPA further states that although nonpoint sources are responsible for most sediment loading in the watershed, point sources also discharge some sediment.

The TMDL identified wasteload allocations for point sources and load allocations for nonpoint sources as pollutant loading rates (tons/square mile/year) for subareas within the Trinity Basin. The source analysis supporting these allocations evaluated sediment loading at a subarea scale, and did not attempt to distinguish sediment loading at the scale of specific land ownership, nor did the source analysis specifically distinguish between land areas subject to NPDES regulation and land areas not subject to NPDES regulation. As a

consequence, the TMDL includes separate but identical load allocations for nonpoint sources and wasteload allocations for point sources for each subarea. The joint LA/WLA's for each subarea are given in the following tables:

Table 5-2. TMDL and Allocations by Source Category for Upper Area

Source Categories		Subareas within the Upper Assessment Area				
		Reference Subwatersheds ¹	Westside Tributaries ²	Upper Trinity ³	East Fork Tributaries ⁴	East Side Tributaries ⁵
Current Sediment Delivery Rate						
Background (non-management)		1,125	421	2,759	258	241
Management	Roads	129	101	162	319	48
	Timber Harvest	240	31	1,084	46	22
	Legacy (Roads, Mining)	7	25	21	26	96
	Total Mgmt.	376	157	1,267	391	96
Total Sediment Delivery		1,051	578	4,026	649	337
Total as percent of background		133%	137%	146%	252%	140%
Loading Capacity (TMDL) and Allocations (tons/mi²/yr)						
TMDL (= 1.25 X Background)		1,406	526	3,449	323	301
Background Allocation		1,125	421	2,759	258	241
Total Management Allocation (= TMDL – Background)		281	105	690	65	60
Percent reduction needed in management to attain TMDL		25%	33%	46%	83%	37%
<ol style="list-style-type: none"> 1. Stuarts Fork, Swift Creek, Coffee Creek 2. Stuart Arm Area, Stoney Creek, Mule Creek, East Fork Stuart Fork, West Side Trinity Lake, Hatchet Creek, Buckeye Creek; 3. Upper Trinity River, Tangle Blue, Sunflower, Graves, Bear Upper Trinity Mainstem Area, Ramshorn Creek, Ripple Creek, Minnehaha Creek, Snowside Gulch Area, Scorpion Creek 4. East Fork Trinity, Cedar Creek, Squirrel Gulch Area 5. East Side Tributaries, Trinity Lake 						

Table 5.3 TMDL and Allocations by Source Category for Upper Middle Area

Source Categories	Subareas within the Upper Assessment Area						
	Weaver and Rush Creeks (72 mi ²)	Deadwood Creek, Hoadley Gulch and Poker Bar Area (47 mi ²)	Lewiston Lake Area (25 mi ²)	Grass Valley Creek ¹ (37 mi ²)	Indian Creek (34 mi ²)	Reading and Brown Creek (104 mi ²)	
Current Sediment Delivery Rates (tons/mi²/yr)							
Background (non-management)	675	273	195	175	324	263	
Management	Roads	144	220	83	287	1,570	125
	Timber Harvest	61	280	37	1,136	330	204
	Legacy (Roads, Mining)	81	62	69	65	68	42
	Total Mgmt.	286	562	189	1,488	1,968	372
Total Sediment Delivery	961	835	384	1,663	2,292	635	
Total as percent of background	142%	305%	197%	950%	707%	241%	
Loading Capacity (TMDL) and Allocations (tons/mi²/yr)							
TMDL (= 1.25 X Background)	844	341	244	219	405	329	
Background Allocation	675	273	195	175	324	263	
Total Management Allocation (= TMDL – Background)	169	68	49	44	81	66	
Percent reduction needed in management to attain TMDL	41%	88%	74%	97%	96%	82%	
1. The rates in Grass Valley Creek do not account for the amount of sediment trapped by Buckhorn Dam and Hamilton Ponds.							

Table 5.4 TMDL and Allocations by Source Category for Lower Middle Assessment Area

Source Categories		Subareas within the Lower Middle Assessment Area				
		Reference Subwatersheds ¹ (434 mi ²)	Canyon Creek (64 mi ²)	Upper Tributaries ² (72 mi ²)	Middle Tributaries ³ (54 mi ²)	Lower Tributaries ² (96 mi ²)
Current Sediment Delivery Rates (tons/mi²/yr)						
Background (non-management)		1,568	1,302	268	210	221
Management	Roads	11	2,482	60	37	41
	Timber Harvest	4	4	29	16	20
	Legacy (Roads, mining)	9	17	46	28	29
	Total Mgmt.	24	2,503	135	81	90
Total Sediment Delivery		1,592	3,805	403	291	311
Total as percent of background		102%	292%	150%	139%	141%
Loading Capacity (TMDL) and Allocations (tons/mi²/yr)						
TMDL (= 1.25 X Background)		1,592	1,628	335	263	276
Background Allocation		1,568	1,302	268	210	221
Total Management Allocation (= TMDL – Background)		24	326	67	53	55
Percent reduction needed in management to attain TMDL		0	87%	50%	35%	39%
<ol style="list-style-type: none"> 1. New River, Big French, Manzanita, North Fork, East Fork North Fork. 2. Dutch, Soldier, Oregon Gulch, Conner Creek Area. 3. Big Bar Area, Prairie Creek, Little French Creek. 4. Swede, Italian, Canadian, Cedar Flat, Mill, McDonald, Hennessy, Quinby Creek Area, Hawkins, Sharber. 						

Table 5.5. TMDL and Allocations by Source Category for Lower Assessment Area

Source Categories	Subareas within the Lower Assessment Area. Outside of Hoopa Valley Tribe Reservation Boundaries					
	Reference Subwatersheds Horse Linto Creek: 64 mi ²)	Mill Creek and Tish Tang (39mi ²)	Willow Creek (43 mi ²)	Campbell Creek and Supply Creek (11 mi ²)	Lower Mainstem Area and Coon Creek (32mi ²)	
Current Sediment Delivery Rates (tons/mi²/yr)						
Background (non-management)	2,110	839	374	7,845	252	
Management	Roads	483	703	854	14,349	76
	Timber Harvest	87	83	201	785	15
	Legacy (Roads, Mining)	26	26	26	26	22
	Total Mgmt.	596	812	1,081	15,160	113
Total Sediment Delivery	2,706	1,651	1,455	23,005	365	
Total as percent of background	128%	197%	389%	293%	145%	
Loading Capacity (TMDL) and Allocations (tons/mi²/yr)						
TMDL (= 1.25 X Background)	2,638	1,049	468	9,806	315	
Background Allocation	2,110	839	374	7,845	245	
Total Management Allocation (= TMDL – Background)	528	210	94	1,961	63	
Percent reduction needed in management to attain TMDL	11%	74%	91%	87%	44%	
Note: Since Background rates for Lower Mainstem Area and Coon Creek were not available from GMA (2001), U.S. EPA used the same rate as was calculated for the Quinby Creek Area is comparable in size and underlain by the same geology type (Galice Formation).						

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation.

Final Sediment WLA Specific to the Department

U.S. EPA issued joint LAs and WLA’s, as noted above, so source-specific wasteload allocations were not developed for this TMDL.

Department’s Sediment Contribution (relative pollutant loading)

It is not possible to estimate the Department’s point source contribution from the source analysis developed by U.S. EPA.

South Fork Trinity River Watershed Sediment Total Maximum Daily Load (U.S. EPA, 1998)

Final Sediment WLA

U.S. EPA states that there are no point source discharges, and set the waste load allocation to zero.

Final Sediment WLA Specific to the Department

There is no waste load allocation for the Department's discharges. In keeping with U.S. EPA's rationale, this means that the waste load allocation for the Department's sediment discharges is zero.

Final Deadlines

No deadlines were specified.

Department's Pollutant Contribution

The Department is mentioned as a possible source of sediment discharges, but the relative contribution of its potential discharges were not measured or estimated. The State highways it mentions in the geographic area included in the TMDL are portions of Highways 36 and 101.

Van Duzen River Watershed Sediment Total Maximum Daily Load (U.S. EPA, 1999)

Final Sediment WLA

U.S. EPA states that there are no point source discharges, and set the waste load allocation to zero.

Final Sediment WLA Specific to the Department

There is no waste load allocation for the Department's discharges. In keeping with U.S. EPA's rationale, this means that the waste load allocation for the Department's sediment discharges is zero.

Final Sediment TMDL Deadlines

No deadlines were specified.

Department's Pollutant Contribution

The Department is mentioned as a possible source of sediment discharges, but the relative contribution of its potential discharges were not measured or estimated. The State highways it mentions in the geographic area included in the TMDL are portions of Highways 3, 36, and 299.

SAN FRANCISCO BAY REGION SEDIMENT AND MERCURY TMDLS

Napa River Sediment TMDL, January 20, 2011

Final Sediment WLA

The wasteload allocations are listed in the following table:

Point Source Category	Current Load		Reduction Needed (percentage)	Wasteload Allocations	
	Metric (Tons/year)	Percentage of Natural Background		Metric (Tons/year)	Percent of Natural Background
Construction Storm Water Order No. 99-08-DWQ	500	0.3	0	500	.03
Municipal Storm Water NPDES Permit No. CAS000001	800	0.5	0	800	0.5
Industrial Storm Water NPDES Permit No. CAS000001	500	0.3	0	500	0.3
Department Storm Water-Order No. 99-06-DWQ	600	0.4	0	600	0.4
Wastewater Treatment Plant Discharges ^a					
City of St. Helena NPDES Permit No. CA0038016	30	<0.1	0	30	<0.1
Town of Yountville/CA Veteran's Home NPDES Permit No. CA0038121	30	<0.1	0	30	<0.1
City of Calistoga NPDES Permit No. CA0037966	40	<0.1	0	40	<0.1
TOTAL	2,500	2		2,500	2

a. For wastewater treatment plant discharges, compliance with existing permit effluent limit of 30 mg/L of TSS is consistent with these wasteload allocations.
Note: Above estimates for loads, percent reductions, and allocations are rounded to two significant figures.

Final Sediment WLA Specific to the Department

The Department's wasteload allocation is 600 metric tons/year.

Final Sediment Deadlines

The Department is deemed to be implementing appropriate control measures if it discharges in compliance with its municipal storm water permit, and if it conducts the monitoring program included in its storm water permit.

Department's Sediment Contribution (relative to pollutant loading)

The Regional Water Board indicates that the Department is a fairly minor anthropogenic source of sediment discharges, and attributes its current discharges to only 0.4% of natural background loading. As a consequence, the Regional Water Board has determined that compliance with its NPDES permit will enable the Department to meet its sediment wasteload allocation.

Sonoma Creek Sediment TMDL, September 8, 2010

Final WLA

Although roadways are cited as a major source of sediment loading in the Sonoma Creek watershed, the Regional Water Board has determined that compliance with its NPDES permit for storm water will enable the Department to meet its wasteload allocation for sediment.

Final Sediment WLA Specific to the Department

The Department's wasteload allocation is 100 tons/year, which is its current (2005) estimated annual discharge of sediment within the area encompassed by this TMDL.

Final Sediment Deadlines

In collaboration with stakeholders in the watershed, Water Board staff will develop a detailed monitoring program to assess progress of TMDL attainment and provide a basis for reviewing and revising TMDL elements or implementation actions. As an initial milestone, by fall 2011, the Regional Water Board and watershed partners were required to complete monitoring plans to evaluate: a) attainment of water quality targets; and b) suspended sediment and turbidity conditions. Initial data collection, based on the protocols established in these monitoring plans was anticipated to begin in the winter of 2011-2012.

Department's Sediment Contribution (relative to pollutant loading)

The Regional Water Board estimates that the Department's point source discharges of sediment constitute approximately 8% of total point sources discharges of sediment.

San Francisco Bay Mercury TMDL, February 12, 2008

The San Francisco Bay Mercury TMDL was adopted by the San Francisco Bay Regional Water Quality Control Board as Resolution Number R2-2006-0052 on August 9, 2006. It was approved by U.S. EPA on February 12, 2008.

Final Mercury WLA

There are no WLAs specific to the Department. Instead, the Department's WLA is an unspecified portion of the WLA assigned to the city or municipal NPDES permit in which the Department's roads or facilities reside.

Final Mercury WLA Specific to the Department

No deadlines specified.

Final Mercury Deadlines

The WLAs must be attained by February 12, 2028.

Department's Mercury Contribution (relative contribution to pollutant loading)

The Department's contribution is unknown.

CENTRAL COAST SEDIMENT TMDLS

Although roadways are cited as a major source of sediment loading in some Central Coast watersheds, the Central Coast Regional Water Board has determined that compliance with the Department's NPDES permit will meet the Department's wasteload allocation.

San Lorenzo River (includes Carbonera Lompico, and Shingle Mill Creeks) Sediment TMDL, February 19, 2004

Final Sediment WLA

The sediment load to the San Lorenzo River derives from both nonpoint sources and point sources. The TMDL combines nonpoint source LAs and point source WLAs for each segment of this TMDL, as specified in the following table:

Sediment Source Category	Allocation (tons/year)			
	Shingle Mill Creek	Carbonera Creek	Lompico Creek	San Lorenzo River
Upland Timber Harvest Plan (THP) Roads	0	419	362	25,215
Streamside THP Roads on Steep Slopes	0	182	164	10,949
Upland Public/ Private Roads	146	1,235	367	13,835
Streamside Public/Private Roads on Steep Slopes	77	135	239	6,178

Sediment Source Category	Allocation (tons/year)			
	Shingle Mill Creek	Carbonera Creek	Lompico Creek	San Lorenzo River
THP Land	0	23	16	1,057
Other Urban and Rural Land	310	2,622	965	43,368
Mass Wasting	0	4,082	6,440	157,388
Channel/Bank Erosion	324	3,030	989	48,149
Total Allocation = TMDL³	857	11,728	9,542	306,139

Note:

³ The term "TMDL" is used here for familiarity. The allowable loads for the San Lorenzo River and its tributaries are actually expressed as a Total Annual Loads (tons/year). This expression of load accounts for seasonal variation in sediment loads explained by the seasonality of rainfall in this region of the Central Coast.

Final Sediment WLA Specific to the Department

As stated above, no specific waste load allocation was assigned to the Department.

Final Sediment Deadlines

Compliance with its municipal storm water permit is deemed to be sufficient to meet the Department's waste load allocation for sediment.

Department's Sediment Contribution (relative contribution to pollutant loading)

This TMDL does not estimate the relative contribution of the Department's roadways/facilities to sediment discharges, but this source appears to be moderate based on this TMDL's source analysis.

Morro Bay (includes Chorro Creek, Los Osos Creek, and the Morro Bay Estuary) Sediment TMDL, January 20, 2004

Final WLA

The sediment load to Morro Bay, Los Osos Creek and Chorro Creek derives from both nonpoint sources and point sources. The TMDL combines nonpoint source LAs and point source WLAs for each segment of this TMDL, as specified in the following table:

Final Sediment WLA Specific to the Department

Loading Allocations (TMDL expressed as annual load)	Watershed	Total (Tons/Yr) Rounded to the nearest ton
	Chorro Creek at Reservoir	6,541
	Dairy Creek	440
	Pennington Creek	966
	San Luisito Creek	7,315
	San Bernardo Creek	10,269
	Minor Tributaries	4,489
	Chorro Creek (Subtotal)	30,020
	Los Osos Creek	3,052
	Warden Creek and Tributaries	1,812
	Los Osos Creek (Subtotal)	4,864
	Morro Bay Watershed (Total)	34,885

Final Sediment WLA Specific to the Department

Although no specific wasteload allocation was assigned to the Department, this TMDL states that discharges which are in compliance with their respective storm water (and other) NPDES permits are meeting their portion of shared responsibility for achieving sediment load reduction.

Final Sediment Deadlines

Implementation will rely on the State’s Plan for NPS pollution control (CWC §13369) and continued implementation of existing regulatory controls as appropriate for point sources, including storm water pursuant to NPDES surface water discharge regulations and Waste Discharge Requirements under Porter-Cologne. Final compliance with sediment load reductions is scheduled to be achieved by 2054 (50 years from the adoption of the TMDL).

Department’s Sediment Contribution (relative contribution to pollutant loading)

The Department’s contribution to sediment loading was not estimated in this TMDL.

LOS ANGELES REGION SEDIMENT/NUTRIENTS/MERCURY TMDLS

Department’s Pollution Contribution:

Although roadways are cited as a major source of sediment loading in some watersheds, for purposes of current sediment-related TMDLs, the Los Angeles Regional Water Board has determined that compliance with its NPDES permit will meet the Department’s wasteload allocations for sediment.

**Ballona Creek Wetlands Sediment and Invasive Exotic Vegetation TMDLs,
March 26, 2012**

Final Sediment WLA

U.S. EPA established wasteload allocations (WLAs) for sediment to address the impairments identified for the Ballona Creek Wetlands. WLAs are assigned to the Los Angeles County MS4 and their co-permittees, and the Department, who are responsible for the loading of sediment into Ballona Creek Wetlands. The WLAs are the total allowable sediment load that can be discharged into Ballona Creek Wetlands. This total sediment load includes both suspended sediment and sediment bed load that are transported from Ballona Creek Watershed into Ballona Creek Wetlands. Invasive exotic vegetation listed on the California Noxious Weed list are given a WLA and LA of zero.

Since the current existing discharge of sediment load is not contributing to the listed impairments or otherwise causing a negative impact to Ballona Creek Wetlands, this TMDL establishes joint WLAs based on existing conditions. The allowable WLA is set at 58,354 yd³/yr (or 44,615 m³/yr). The joint wasteload allocation is as follows:

Responsible Jurisdiction	Input	Sediment Wasteload Allocation ¹ (yd ³ /yr)	Existing Total Sediment Load (yd ³ /yr)
Los Angeles County MS4 , Co-Permittees & Department	Ballona Creek Watershed	58,354	58,354

Final Sediment WLA Specific to the Department

As stated above, there is no WLA specific to the Department. The joint point source WLA is 58,354 cubic yards of sediment per year, which is equivalent to the current estimated total sediment loading contributed by these sources.

Final Sediment Deadlines

U.S. EPA did not specify deadlines for implementation of this TMDL.

Department’s Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to anthropogenic sediment loading is not estimated or quantified in this TMDL. However, the joint WLAs are set to the current estimated sediment discharges, which the Department can meet through compliance with its NPDES municipal storm water permit.

Calleguas Creek and its Tributaries & Mugu Lagoon Metals (including Mercury) and Selenium TMDL, March 26, 2007

Final Mercury WLA

The Department shares group mass-based WLAs for mercury for Calleguas Creek and Revolon Slough with other Permitted Storm water Dischargers (PSDs). Final WLAs are mass-based and are dependent upon annual flow ranges.

Final Mass-based WLAs for Annual Flow Ranges, Mercury in Suspended Sediment

Flow Range, Millions of Gallons per Year	Calleguas Creek (lbs/yr)	Revolon Slough (lbs/yr)
0-15,000 MGY	0.4	0.1
15,000-25,000 MGY	1.6	0.7
Above 25,000 MGY	9.3	1.8

Final Mercury WLA Specific to the Department

There is no specific allocation for the Department.

Final Mercury Deadlines

The final WLAs must be achieved within 15 years after the effective date of the amendment, or March 26, 2022.

Department's Mercury Contribution (relative contribution to pollutant loading)

The Department's areal proportion of the watershed is not known.

The Los Angeles Area Lakes and Reservoir

TMDLs specific to the Department include targets for the following lakes:

- Echo Park Lake: nitrogen phosphorus, chlordane, dieldrin, PCBs, and trash
- Lake Sherwood: mercury
- Legg Lakes (North, Center and Legg): nitrogen and phosphorus
- Peck Road Park Lake: nitrogen and phosphorus
- Puddingstone Reservoir: nitrogen, phosphorus, chlordane, DDT, PCBs, Hg, and Dieldrin

Wasteload allocations were assigned to responsible jurisdictions based on existing loading of nitrogen and phosphorus to each lake. To allow flexibility in implementing the nutrient TMDLs, responsible jurisdictions receiving required reductions have the option to submit a request to the Regional Board for alternative concentration-based wasteload allocations. These jurisdictions can receive alternative concentration-based wasteload allocations not to exceed 1.0 and 0.1 milligrams per liter total nitrogen and total phosphorus, respectively.

During wet weather, runoff from industrial sites has the potential to contribute pollutant loadings. During dry weather, the potential contribution of pollutant loadings from industrial storm water is low because non-storm water discharges are prohibited or authorized by the

permit only under the following circumstances: when they do not contain significant quantities of pollutants, where Best Management Practices are in place to minimize contact with significant materials and reduce flow, and when they are in compliance with Regional Board and local agency requirements.

Los Angeles Area (Echo Park Lake) Total Nitrogen, Total Phosphorus, Chlordane, Dieldrin, PCBs, and Trash TMDLs, March 26, 2012)

Final Nutrient WLAs

	Total Phosphorus, (lbs/year)	Total Nitrogen, (lbs/year)
TOTAL	83.3	682

Final Nutrient WLAs Specific to the Department

Subwatershed	Total Phosphorus, (lbs/year)	Total Nitrogen, (lbs/year)
Northern	0.608	4.77
Southern	0.051	0.403

Final Nutrient Deadlines

There are no final deadlines specified for the Department.

Department's Nutrient Contributions (relative contribution to pollutant loading)

Subwatershed	Percentage of the Total Phosphorus Load	Percentage of the Total Nitrogen Load
Northern	0.6 %	0.7 %
Southern	0.05 %	0.06 %

Los Angeles Area (North, Center & Legg Lakes) Nitrogen and Phosphorus, TMDLs, March 26, 2012

Final Nutrient WLA Nitrogen & Phosphorous TMDLs

	Total Phosphorus (lbs/year)	Total Nitrogen (lbs/year)
TOTAL	1,541	9,135

Final WLAs Specific to the Department

Subwatershed	Total Phosphorus, (lbs/year)	Total Nitrogen, (lbs/year)
Direct to Center Lake	4.6	15.5
Direct to Legg Lake	1.2	4.0
Direct to North Lake	19.1	64.1
Northwestern	9.4	29.3
Northeastern	10.9	34.0

Alternative concentration-based WLAs are available to the Department if it satisfies certain criteria as detailed in the TMDL. Those WLAs are:

Subwatershed	Maximum Allowable WLA for Total Phosphorus (mg/L)	Maximum Allowable WLA for Total Nitrogen (mg/L)
Direct to Center Lake	0.1	1.0
Direct to Legg Lake	0.1	1.0
Direct to North Lake	0.1	1.0
Northwestern	0.1	1.0
Northeastern	0.1	1.0

Final Nutrient Deadlines

There are no final deadlines specified for the Department.

Department's Nutrient Contribution (relative contribution to pollutant loading)

Subwatershed	Percentage of the Total Phosphorus Load	Percentage of the Total Nitrogen Load
Direct to Center Lake	0.2 %	0.2 %
Direct to Legg Lake	0.1 %	<0.1 %
Direct to North Lake	1.0 %	0.6 %
Northwestern	0.5 %	0.3 %
Northeastern	0.6 %	0.3 %

Los Angeles Area (Peck Road Park Lake) Nitrogen, Phosphorus, Chlordane, DDT, Dieldrin, PCBs, and Trash TMDLs, March 26, 2012

Final Nutrient WLAs

	Total Phosphorus (lbs/year)	Total Nitrogen (lbs/year)
TOTAL	19,319	186,845

Final Nitrogen & Phosphorus WLA Specific to the Department

Subwatershed	Total Phosphorus (lbs/year)	Total Nitrogen (lbs/year)
Eastern	158	1,165
Western	34.2	251

Final Nutrient Deadlines

There are no final deadlines specified for the Department.

Department's Nutrient Contribution (relative contribution to pollutant loading)

Subwatershed	Percentage of the Total Phosphorus Load	Percentage of the Total Nitrogen Load
Eastern	0.8 %	0.6 %
Western	0.2 %	0.1 %

Los Angeles Area (Puddingstone Reservoir) Nitrogen, Phosphorus, Chlordane, DDT, PCBs, Mercury, and Dieldrin TMDLs, March 26, 2012

Final Nutrient WLAs for Puddingstone Reservoir

Final Nitrogen and Phosphorus WLAs

	Total Phosphorus (lbs/year)	Total Nitrogen (lbs/year)
TOTAL	4,226	18,756

Final Nitrogen, Phosphorus WLAs Specific to the Department

Subwatershed	Total Phosphorus (lbs/year)	Total Nitrogen (lbs/year)
Northern	167	745
Southern	14.8	68.2

Alternative concentration-based WLAs are available to the Department if it satisfies certain criteria as detailed in the TMDL. Those WLAs are:

Subwatershed	Maximum Allowable WLA for Total Phosphorus (mg/L)	Maximum Allowable WLA for Total Nitrogen (mg/L)
Northern	0.1	1.0
Direct Southern	0.1	1.0

Final Nutrient Deadlines

There are no final deadlines specified for the Department.

Department's Nutrient Contribution (relative contribution to pollutant loading)

Subwatershed	Percentage of the Total Phosphorus Load	Percentage of the Total Nitrogen Load
Northern	3.6 %	3.4 %
Southern	0.3 %	0.3 %

Final Mercury WLA for Puddingstone Reservoir

Final Waste Load Allocations are assigned to the Department for sub-watersheds for Puddingstone Reservoir, and must be met at the Department's discharge points.

Final Mercury WLA for Puddingstone Reservoir Specific to the Department

Mercury WLAs for Puddingstone Reservoir

Subwatershed	Area (ac)	Existing Annual Hg Load (g/yr)	Percent of Load	Final Wasteload Allocation (g/yr)
Puddingstone-Northern	110	1.32	1.85	0.702
Puddingstone-Southern	11.6	0.0960	0.13	0.051

Fish Harbor is impaired for mercury in sediment. The Department is named as a responsible party for WLAs to Fish Harbor. The final concentration-based WLA for sediment in Fish Harbor is 0.15 mg per kilogram of dry sediment.

Final Mercury Deadlines for Puddingstone Reservoir

The Department is subject to the prescribed point source interim WLAs which are effective as of March 23, 2012. Compliance with all final WLAs is required by March 23, 2032.

Department's Mercury Contribution for Puddingstone Reservoir (relative contribution to pollutant loading)

Subwatershed	Annual Hg Load (g/yr)	Percent of Total Load
Northern	1.32	1.85
Southern	0.096	0.13
Total	1.42	1.99

Los Angeles Area (Lake Sherwood) Mercury TMDL, March 26, 2012

Final Mercury WLA

Final waste load allocations are assigned to the Department for one sub-watershed, Lake Sherwood, and must be met at the Department's discharge points.

Final Mercury WLA Specific to the Department

Mercury WLAs for Lake Sherwood

Subwatershed	Area (ac)	Existing Annual Hg Load (g/yr)	Percent of Load	Final Wasteload Allocation (g/yr)
Carlisle Canyon	2.75	0.049	0.12	0.014

Final Mercury Deadlines

There are no final deadlines specified for the Department.

Department's Mercury Contribution (relative contribution to pollutant loading)

Subwatershed	Annual Hg Load (g/yr)	Percent of Total Load
Carlisle Canyon	0.049	0.12
Entire Watershed	0.049	0.001

Machado Lake Eutrophic, Algae, Ammonia, and Odors (Nutrients), March 11, 2009

Final Nutrients WLA

Final concentration-based Waste Load Allocations are established for total phosphorus and total nitrogen (defined as the sum of the concentrations of Total Kjeldhal Nitrogen, Nitrate as N, and Nitrite as N). For most storm water permittees, the final WLA for total phosphorus is 0.1 mg/L. For total nitrogen, the final WLA is 1.0 mg/L.

Final Nutrients WLA Specific to the Department

For the Department, the final WLA for total phosphorus is 0.1 mg/L. For total nitrogen, the final WLA is 1.0 mg/L.

Final Nutrients Deadlines

The Department must achieve its final WLAs by September 11, 2018.

Department's Nutrients Contribution (relative contribution to pollutant loading)

The Department's contribution to the overall loading is not defined in the TMDL. The draft Machado Lake Nutrients TMDL Implementation Plan, submitted on March 11, 2011 by the Department states that the Department's roadways and facilities comprise approximately 1.2 percent of the Machado Lake Watershed.

Malibu Creek & Lagoon TMDL for Sedimentation and Nutrients, July 2, 2013

Sediment loading into Malibu Lagoon is much higher than naturally expected. The excess sediment accumulates in the Lagoon tidal channels and carries greater nutrient loads and cause algae blooms with likely adverse impacts on benthic macroinvertebrates.

Final Sedimentation WLA

Allocations for Sedimentation as listed in Table 10-2. (Based on SCAG 2008 land use and Jurisdictional maps provided by MS4 Co-permittees.)

Type of Allocation	Responsible Party	Impervious Area (total acres)	Pervious Area (acres)	Allocation Fraction	Sedimentation Allocation (tons/yr)
WLA	WLA Los Angeles Co. below	887	10,612	17.4%	1,012
WLA	Department below Malibou Lake	60	61	0.8%	44
LA	Unincorporated area draining to Las Virgenes Creek**	8	267	0.3%	16
LA	Protected land below Malibou Lake*	253	16,820	13.7	796
LA	Load Allocation at outlet of Malibou Lake	3,669	37,550	67.9%	3,950
Total		4,878	65,310	100.0 %	5,817

Final Sedimentation WLA Specific to the Department

See Table 10-2 above for the Department's below Malibou Lake.

Final Sedimentation Deadlines

U.S. EPA did not develop final deadlines for this TMDL.

Department's Sedimentation Contribution (relative contribution to pollutant loading)

See the Department's Nutrients Contribution below.

Final Nutrients WLA

There are no total final WLAs for Malibu Creek and Lagoon. Below are the concentration-based numeric targets as listed in Table 10-4 of this TMDL.

Season	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)
Summer (Apr 15 – Nov 15)	0.65	0.1
Winter (Nov 16 - Apr 14)	1.0	0.2

Final Nutrients WLA Specific to the Department

Final WLAs are established Total Nitrogen (TN) and Total Phosphorus (TP) for summer and winter as listed in Table 10-4 of this TMDL.

Summer TN, mg/l (Apr 15 – Nov 15)	Winter TN, mg/l (Nov 16 – Apr 14)	Summer TP, mg/l (Apr 15 – Nov 15)	Winter TP, mg/l (Nov 16 – Apr 14)
1.0	4.0	0.1	0.2

Final Nutrients Deadlines

EPA did not develop final deadlines for this TMDL.

Department's Nutrients Contribution (relative contribution to pollutant loading)

The Department's total area within the watershed is 206 acres, of a total of 65,310 acres or 0.317% of the total watershed.

The Department's contribution to the nutrient loads is not specified in the TMDL, but it can be assumed that the contribution is nearly the same as the allocation fraction for sediment in Table 10-2, at 0.8%. Multiplying the monthly watershed loads for winter and summer from Tables 5-3 and 5-4, respectively, by the Department's allocation fraction provides an approximation of the Department's total contribution to the monthly load.

Source	Summer TN Load kg/mo (Apr 15 – Nov 15)	Winter TN Load kg/mo (Nov 16 – Apr 14)	Summer TP Load kg/mo (Apr 15 – Nov 15)	Winter TP Load kg/mo (Nov 16 – Apr 14)
Total Load	789	20,442	140	2,842
Department Runoff (estimate based on area)	6.31	164	1.12	22.7

Ventura River and its Tributaries Algae, Eutrophic Conditions, and Nutrients TMDL, June 28, 2013

This TMDL establishes dry-weather and wet-weather WLAs for nitrogen and a dry-weather TMDL for phosphorus.

Final Nutrients WLA

The final dry-weather Total Nitrogen and Total Phosphorus loads are not explicitly stated in the TMDL.

Final Nutrients WLA Specific to the Department

The final total dry-weather total nitrogen WLA for the Department is 1.1 pound/day. The final dry-weather total phosphorus WLA for the Department is 0.11 pound/day.

Wet-weather allocations for “nitrogen”, defined as the sum of Nitrate-N and Nitrite-N, are the same for all storm water dischargers and are site-specific to the reaches of the watershed:

Reach	Nitrate-N + Nitrite-N (mg/L)
Estuary	7.4
Reach 1	7.4
Reach 2	10
Cañada Larga	10
Reach 3	5
San Antonio Creek	5
Reach 4	5
Reach 5	5

Final Nutrients Deadlines

Wet-weather WLAs for the Department apply on the effective date of the TMDL. Dry-weather WLAs for the Department must be achieved by June 28, 2019.

Department’s Nutrients Contribution

The Department’s proportional contributions to the final WLAs are estimated to be approximately 1 percent each.

CENTRAL VALLEY REGION NUTRIENTS AND MERCURY TMDLS***Clear Lake Nutrients TMDL, September 21, 2007*****Final Nutrients WLA**

The final WLA for phosphorus for Clear Lake is 2100 kg per year.

Final Nutrients WLA Specific to the Department

The Department is given a final WLA for phosphorus of 100 kg per year.

Final Nutrients Deadlines

The Department shall achieve its WLAs by September 21, 2017.

Department’s Nutrients Contribution (relative contribution to pollutant loading)

The Department contributes 4.8 percent to the final phosphorus WLA.

**Cache Creek, Bear Creek, Sulphur Creek and Harley Gulch Mercury TMDL,
February 7, 2011**

Final Methylmercury WLA

Implementation Summary Cache Creek and Bear Creek Methylmercury Allocations

Source	Acceptable Annual Load (g/yr)
Cache Creek (Clear Lake to North Fork Confluence)	11
North Fork Cache Creek	12.4
Harley Gulch	0.04
Davis Creek	0.7
Bear Creek @ Highway 20	3
In-channel production and un-gauged tributaries	32
Bear Creek @ Bear Valley Road	0.9
Sulphur Creek	0.8
In-channel production and un-gauged tributaries	1

Final Mercury WLA Specific to the Department

No specific WLA assigned to the Department.

Final Mercury Deadlines

None specified.

Department's Mercury Contribution (relative contribution to pollutant loading)

The Department's relative contribution to pollutant loading is not known.

**Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL,
October 20, 2011**

Final Methylmercury WLA

Delta Methylmercury Allocations

Permittee	NPDES Permit	Waste Load Allocation (g/yr)
Central Delta		
County of Contra Costa	CAS083313	0.75
City of Lodi	CAS000004	0.053
Port of Stockton MS4	CAS084077	0.39
County of San Joaquin	CAS000004	0.57
Stockton Area MS4	CAS083470	3.6
SUBTOTAL		5.4
Marsh Creek		
County of Contra Costa	CAS083313	0.30
SUBTOTAL		0.30
Mokelumne River		

Permittee	NPDES Permit	Waste Load Allocation (g/yr)
County of San Joaquin	CAS000004	0.016
<i>SUBTOTAL</i>		<i>0.016</i>
Sacramento River		
City of Rio Vista	CAS000004	0.0078
Sacramento Area MS4	CAS082597	1.0
County of San Joaquin	CAS000004	0.11
County of Solano	CAS000004	0.041
City of West Sacramento	CAS000004	0.36
County of Yolo	CAS000004	0.041
<i>SUBTOTAL</i>		<i>1.6</i>
San Joaquin River		
City of Lathrop	CAS000004	0.097
Port of Stockton MS4	CAS084077	0.0036
County of San Joaquin	CAS000004	0.79
Stockton Area MS4	CAS083470	0.18
City of Tracy	CAS000004	0.65
<i>SUBTOTAL</i>		<i>1.7</i>
West Delta		
County of Contra Costa	CAS083313	3.2
<i>SUBTOTAL</i>		<i>3.2</i>
Yolo Bypass		
County of Solano	CAS000004	0.021
City of West Sacramento	CAS000004	0.28
County of Yolo	CAS000004	0.083
<i>SUBTOTAL</i>		<i>0.38</i>
TOTAL		<i>12.596</i>

Final Methylmercury WLA Specific to the Department

There are no WLAs specific to the Department. However, allocations for each of the defined municipal entities in the above table include all current and future permitted dischargers within the geographic boundaries of these municipalities and unincorporated areas, including the Department.

Final Methylmercury Deadlines

The final WLAs for dischargers in the Delta and Yolo bypass shall be met as soon as possible, but no later than January 1st, 2030.

Department's Methylmercury Contribution (relative contribution to pollutant loading)

The Department's contribution to the methylmercury load is not known.

LAHONTAN REGION SEDIMENT/NUTRIENTS TMDLS

Lake Tahoe Sediment and Nutrients TMDL, August 16, 2011

Attachment IV incorporates TMDL-specific permit requirements for the sediments and nutrients TMDL for Lake Tahoe. The TMDL requires the Department to meet pollutant load reduction requirements and to develop and implement a comprehensive Pollutant Load Reduction Plan (PLRP).

Final Sediment WLA

The pollutant load reduction requires the Department to reduce fine sediment particle (FSP), total phosphorus (TP), and total nitrogen (TN) loads by ten percent, seven percent and eight percent respectively by September 30, 2016. The Department shall prepare a Pollutant Load Reduction Plan (PLRP) describing how it expects to meet the pollutant load reductions.

Final Sediment Deadlines

This plan is to be submitted no later than July 15, 2013. By July 15, 2014, the Department shall submit a Progress Report documenting pollutant load reductions accomplished between May 1, 2004 (baseline year) and October 15, 2011. The Department shall also prepare and submit a Storm Water Monitoring Plan for review and approval by the Regional Board by July 15, 2013 and implement the approved plan.

Final deadlines for both nitrogen and phosphorus WLAs are for 65 years after the effective date of the TMDL (August 16, 2076).

Department's Sediment Contribution (relative contribution to pollutant loading)

Final Nutrient WLA

Constituent	Basin-Wide Load (MT/yr)	Urban Upland Load	Final Urban Upland Reduction %	Final WLA, (MT/yr)
Nitrogen	345	63	50	31.5
Phosphorus	38	18	46	8.28

Final Nutrient WLA Specific to the Department

The Department's specific contributions to the loads are not defined. The Department is part of a group of Urban Upland (storm water) dischargers. The Department was required to submit a 2004 baseline load estimate specific to its jurisdiction by August 16, 2013.

Final Nutrient Deadlines

Final deadlines for both nitrogen and phosphorus WLAs are for 65 years after the effective date of the TMDL (August 16, 2076).

Department's Nutrient Contribution (relative contribution to pollutant loading)
The Department's relative contribution to pollutant loading is not known.

Truckee River Sediment TMDL, September 16, 2009

TMDL attainment will be evaluated through the TMDL targets: these targets express desired conditions in the watershed, rather than sediment mass reductions. This was deemed to be appropriate because sediment mass reductions are not a practical indication of beneficial use protection due to the inherent natural variability of sediment delivery and the uncertainties associated with accurately measuring sediment loads and reductions.

Final Sediment WLA

For the most part, point source dischargers' compliance with their respective NPDES permits are deemed to be evidence of compliance with their respective responsibilities to help achieve desired watershed conditions, as described above.

Final Sediment WLA Specific to the Department

The Department's compliance with its storm water permit is deemed to be evidence of compliance with its responsibility to help achieve desired watershed conditions, as described above.

Final Sediment TMDL Deadlines

The Truckee River instream sediment targets are currently being met and will be further evaluated for TMDL attainment.

Department's Contribution (relative contribution to pollutant loading)

The Department's relative contribution to sediment pollutant loading is not known.

SANTA ANA REGION NUTRIENTS AND MERCURY TMDLS

Big Bear Lake Nutrients for Dry Hydrological Conditions TMDL, September 25, 2007

This TMDL contains waste load allocations for phosphorus loads under dry hydrological conditions, defined as an average tributary inflow to Big Bear Lake ranging from 0 to 3,049 acre-feet, average lake levels ranging from 6,671 to 6,735 feet and annual precipitation ranging from 0 to 23 inches.

Final Nutrients WLA

The total Waste Load Allocation is 475 pounds/year.

Final Nutrients WLA Specific to the Department

There is no WLA specific to the Department.

Final Nutrients Deadlines

The WLA must be achieved by December 31, 2015.

Department’s Nutrients Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to nutrient pollutant loading is not known.

Lake Elsinore and Canyon Lake Nutrients TMDL, September 30, 2005

The Department has already committed to cooperative implementation actions, monitoring actions, special studies and implementation actions jointly with other responsible agencies as an active paying member of the Lake Elsinore/Canyon Lake TMDL Task Force. If the Department doesn’t fulfill its Lake Elsinore/Canyon Lake Task Force obligations or if the Department chooses to opt out of the cooperative approach with the TMDL Task Force for implementation actions, monitoring actions, and/or special studies then the Department will have to implement the requirements listed in Table IV.2. of Attachment IV.

Final Nutrients WLA

Waterbody	Final Total Phosphorus Waste Load Allocation (kg/year)	Final Total Nitrogen Waste Load Allocation (kg/year)
Canyon Lake	487	6,248
Lake Elsinore	3,845	7,791

Final Nutrients WLA Specific to the Department

There are no WLAs specific to the Department.

Final Nutrients Deadlines

Final allocation compliance is to be achieved by December 31, 2020.

Department’s Nutrient Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to the nutrient pollutant loading is not available.

Rhine Channel Area of Lower Newport Bay Chromium and Mercury, U.S. EPA Established on June 14, 2002

Mercury Final WLA

A WLA for mercury to Rhine Channel is 0.225 kilograms/year.

Mercury Final WLA Specific to the Department

The final mass-based Mercury WLA for the Department is 0.0027 kilograms/year.

Mercury Final Deadlines

The Santa Ana Regional Water Quality Control Board anticipated a Basin Plan Amendment addressing implementation of the above TMDLs in 2007; these amendments have not yet been completed

Department's Mercury Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the mercury loading is approximately three percent. This WLA was developed by taking the available load and dividing it roughly in proportion to the land areas associated with the remaining source categories (including the Department).

SAN DIEGO REGION SEDIMENT AND NUTRIENTS TMDLS

Historical loading of sediment to some coastal wetlands within Region 9 has resulted in impacts to natural wetland functions. The excess deposition and movement of sediment within remaining coastal wetlands has greatly altered the natural conditions. Urbanized development of the watershed and the channel straightening has modified both the sediment supply and the ability of flows to transport sediments. Additionally, channelization of streams has cut off the banks and floodplains of natural rivers within these watersheds. Sediments carried in flows are not stored within the banks but are rather transported to the outlet of coastal estuaries where they are deposited. Recurring dredging operations in coastal areas also affect sediment transport and deposition patterns in these watersheds. Wetland and estuarine habitats tend to be fragmented by existing roads, infrastructure, and surrounding urbanized development.

In some Region 9 watersheds, natural processes of erosion have been accelerated due to anthropogenic watershed disturbances, resulting in impairment of additional principally biological resources, but also recreational uses, including: RARE, MIGR, SPWN, WILD, EST, MAR, BIOL, REC1, REC2, NAV.

Rainbow Creek Total Nitrogen and Total Phosphorus TMDL, March 22, 2006

Final Nutrient WLA

The final WLA for nitrogen is 82 kilograms/year. The final WLA for phosphorus is eight kilograms/year.

Final Nutrient WLA Specific to the Department

The final WLA for nitrogen for the Department is 49 kilograms/year. The final WLA for phosphorus for the Department is five kilograms/year.

Final Nutrient Deadlines

The Department shall achieve the final WLA by December 31, 2021.

Department's Nutrient Contribution (relative contribution to pollutant loading)

The Department's contribution to the nitrogen and phosphorus WLAs is three percent of the total.

C. Metals/Toxics/Pesticides TMDL Pollutant Category

General Description of Pollutant Category

Toxic pollutants, including but not limited to Pesticides, Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs), cause several impairments to California's water quality.

Sources of Pollutant & How it Enters the Waterway

The main transport mechanism for these pollutants is through fine sediment. Once the contaminated fine sediments wash off the roadways and into storm drains or nearby receiving waters they re-suspend in the water column and become bioavailable.

Metals including copper, zinc, lead, cadmium, nickel and chromium are toxic to aquatic life and cause impairments to California's waterbodies. Toxic metals are present in water as both dissolved and total recoverable fractions. During times of high precipitation (storm events), the primary transport mechanism for metals, especially in the total recoverable fraction, is again the mobilization of fine sediment. Accumulated contaminated fine sediment washes off roadways and into storm drains or nearby receiving waters. Metals in the sediment become bioavailable while suspended in the water column. During times of low precipitation, flows that reach storm drains or discharge points are typically insufficient to mobilize fine sediment, but dissolved metal ions are still bioavailable and reach discharge points.

Mechanical components of automobiles, especially those that are subjected to frictional stresses are either known or supposed sources of these metals (i.e., copper from brake pads and zinc from synthetic rubber tires). Some toxic metals are also present in petroleum-based lubricants and in gasoline and diesel fuel (i.e. cadmium).

Watershed Contribution

The Department is identified in many TMDLs as a source of toxic pollutants because they own and operate the roadways which act as conveyance systems of fine sediments. However, in most cases the Department makes up a relatively minor load for toxic pollutants because the models used to develop TMDLs rely on the percentage of land use to determine WLAs.

The Department is named in the TMDLs below as a source of metals in storm water because it owns, operates and maintains roadways and facilities present in these watersheds. As with toxics, in most cases, the Department is assigned a relatively minor proportion of the entire storm water WLA for each metal because its roadways and facilities comprise a small proportion of the total watershed area.

Control Measures

The requirements in Part C of Attachment IV of this permit address both dissolved and sediment-bound sources of toxics and metals. Section C.1 addresses treatment of the fine sediment fraction of toxics and metals and requires that the Department implement structural controls/BMPs.

Dissolved fraction metal impairments require an inventory of outfalls/discharge points to waterbodies within each prioritized reach impaired by dissolved fraction metals and to propose and implement appropriate controls consistent with the report.

The Reach Prioritization and Implementation Requirements in Section I.A. and I.B. of Attachment IV place a priority on identifying and addressing the highest source generating areas. This strategy will control the largest sources of fine sediment for a minor pollutant source and allow for attainment of the applicable WLAs consistent with the Toxic Pollutants and Metals TMDLs identified in Table IV.2 of Attachment IV.

In Section III.C.1, the options for controlling sediment-bound toxics and metals are essentially the same. The types of BMPs expected to be implemented to address fine sediment discharges under C.1 are those expected to be implemented to address sediment discharges for the sediment TMDLs discussed above.

Section III.C.2 explains that Dissolved Fraction Metals levels in storm water are reduced when contaminated sediment is removed or mitigated, but additional structural and non-structural BMPs may still be necessary to achieve compliance. In some cases, this may require building or instituting BMPs in addition to those used for metals in fine sediments for the same discharge points. Structural BMPs might include Infiltration or detention basins/trenches, filtration using metal-absorbing media, etc.

Section III.C.3. Pesticides. The Department is to comply with the Vegetation Control provision that specifies practices for the safe handling and use of pesticides, including compliance with federal, state and local regulations, and label directions.

SAN FRANCISCO BAY REGION TOXIC TMDLS

San Francisco Bay PCBs TMDL, March 29, 2010

The TMDL identifies storm water runoff as a major source for PCB transport and includes the Department's roadways, non-roadway facilities, and rights-of-way.

Final PCBs WLA

The total WLA for all storm water runoff sources is two kilograms/year.

Final PCBs WLA Specific to the Department

All storm water runoff sources share a two kilograms/year WLA.

Final PCBs Deadlines

The WLA of two kilograms/year is broken up by county and is to be achieved within 20 years or March 29, 2030.

Department's PCBs Contribution (relative contribution to pollutant loading)

The TMDL also directs the storm water sources to implement this TMDL through the applicable NPDES permits.

San Francisco Bay Urban Creeks Diazinon and Pesticide Toxicity, May 16, 2007**Final Pesticide Toxicity WLA**

The TMDL states that most urban runoff flows through storm drains operated by all storm water entities including the Department. The WLA for each storm water entity is 1 TUC_a (TUC_a = 100/No Observed Adverse Effect Concentration) and one TUC_c (TUC_c = 100/No Observed Effect Concentration) in water and sediment.

Final Pesticide Toxicity WLA Specific to the Department

The Department's level of responsibility is not identified.

Final Pesticide Toxicity Deadlines

The TMDL specifies that all NPDES permits for runoff management agencies, including the Department, require implementation of best management practices and control measures that reduce pesticides in urban runoff to the maximum extent practicable. No final compliance date is specified, however, the Regional Water Board may require additional control measures if the Department fails to meet the TMDL targets.

Department's Contribution (relative contribution to pollutant loading)

The Department's relative contribution to pesticide toxicity pollutant loading is not known.

LOS ANGELES REGION METALS AND TOXICITY TMDLS***Ballona Creek Metals & Selenium TMDL, December 22, 2005 and reaffirmed on December 29, 2008***

The TMDL identifies storm water as a significant contributor to loadings of copper, lead and zinc (and selenium) to Ballona Creek and Sepulveda Canyon Channel in both dry weather and wet weather.

Final Metals WLA

Storm water allocations are divided among the MS4 and general permits named in the TMDL based on an areal weighting approach.

Final Metals WLA Specific to the Department

The Department is assigned separate dry-weather and wet-weather Waste Load Allocations (WLAs). Dry-weather conditions apply to days when the maximum daily flow in Ballona Creek is less than 40 cubic feet per second (cfs), and wet-weather conditions apply to days when the maximum daily flow in Ballona Creek is equal to or greater than 40 cfs. Both dry-weather and wet-weather WLAs are mass-based, although alternate concentration-based dry-weather WLAs are allowed due to the expense of obtaining accurate flow measurements.

Dry-weather WLAs g/day, Total Recoverable Metal:

Waterbody	Copper	Lead	Zinc
Ballona Creek	11.2	6.0	143.1
Sepulveda Channel	5.1	2.7	64.7

Wet-weather WLAs, g/day, Total Recoverable Metal; V is daily flow volume in liters:

Waterbody	Copper	Lead	Zinc
All	$2.37 * V * 10^{-7}$	$7.78 * V * 10^{-7}$	$1.57 * V * 10^{-6}$

Alternate dry-weather WLAs, µg/L, Total Recoverable Metal:

Waterbody	Copper	Lead	Zinc
All	24	13	304

Final Metals Deadlines

The Department is responsible for meeting its assigned mass-based WLAs, but has the option to work with the other MS4 permittees. Each municipality and permittee is required to meet the storm water waste load allocation at designated TMDL effectiveness monitoring points. The MS4 permittees including the Department may use a combination of structural and non-structural BMPs to achieve compliance with the storm water WLAs. Total compliance is to be achieved by January 11, 2021.

Department's Metals Contribution (relative contribution to pollutant loading)

The Department's relative contribution to metals pollutant loading is not known.

Ballona Creek Estuary Toxic Pollutants TMDL, December 22, 2005

Final OC-Compounds & PAHs WLA

The storm water WLAs are apportioned between the MS4 permittees, the Department, the general construction, and the general industrial storm water permits based on an areal weighting approach.

Final WLA Specific to the Department

The Department is assigned the following WLAs based on the 1.3 percent land area associated with the Department:

Metals Storm Water WLAs Apportioned between Permits

Cadmium (kg/yr)	Copper (kg/yr)	Lead (kg/yr)	Silver (kg/yr)	Zinc (kg/yr)
0.11	3.2	4.4	0.09	14

Organics Storm Water WLAs Apportioned between Permits

Total Chlordane (g/yr)	Total DDTs (g/yr)	Total PCBs (g/yr)	Total PAHs (g/yr)
0.05	0.15	2	400

Final WLA Deadlines

The implementation schedule for the MS4 and the Department permittees consists of a phased approach, with compliance to be achieved in prescribed percentages of the watershed with total compliance to be achieved within 15 years of the TMDL effective date or December 22, 2020.

Department's WLA Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the pollutant loading is unknown.

Calleguas Creek OC Pesticides, PCBs, and Siltation TMDL, March 14, 2006

Final OC Pesticides & PCBs WLA

In accordance with current U.S. EPA practice, a group concentration-based WLA has been developed for MS4s, including the Department's MS4. The grouped allocation will apply to all NPDES-regulated municipal storm water discharges in the Calleguas Creek Watershed. Storm water WLAs will be incorporated into the NPDES permit as receiving water limits measured at the downstream points of each subwatershed and are expected to be achieved through the implementation of BMPs as outlined in the implementation plan.

Interim WLAs as an In-stream Annual Average (ng/g)

Pollutant	Mugu Lagoon	Calleguas Creek	Revolon Slough	Arroyo Las Posas	Arroyo Simi	Conejo Creek
Total Chlordane	25.0	17.0	48.0	3.3	3.3	3.4
4,4-DDD	69.0	66.0	400.0	290.0	14.0	5.3
4,4-DDE	300.0	470.0	1,600.0	950.0	170.0	20.0
4,4-DDT	39.0	110.0	690.0	670.0	25.0	2.0
Dieldrin	19.0	3.0	5.7	1.1	1.1	3.0

Pollutant	Mugu Lagoon	Calleguas Creek	Revolon Slough	Arroyo Las Posas	Arroyo Simi	Conejo Creek
Total PCBs	180.0	3,800.0	7,600.0	25,700.0	25,700.0	3,800.0
Toxaphene	22,900.0	260.0	790.0	230.0	230.0	260.0

Final WLAs as an In-stream Annual Average

Pollutant	Mugu Lagoon (ng/g)	Calleguas Creek (ng/g)	Revolon Slough (ng/g)	Arroyo Las Posas (ng/g)	Arroyo Simi (ng/g)	Conejo Creek (ng/g)
Total Chlordane	3.3	3.3	0.9	3.3	3.3	3.3
4,4-DDD	2.0	2.0	2.0	2.0	2.0	2.0
4,4-DDE	2.2	1.4	1.4	1.4	1.4	1.4
4,4-DDT	0.3	0.3	0.3	0.3	0.3	0.3
Dieldrin	4.3	0.2	0.1	0.2	0.2	0.2
Total PCBs	180.0	120.0	130.0	120.0	120.0	120.0
Toxaphene	360.0	0.6	1.0	0.6	0.6	0.6

Final OC Pesticides & PCBs WLA Specific to the Department

See Tables above.

Final OC Pesticides & PCBs Deadlines

The above Final WLAs (ng/g) as an in-stream annual average are to be achieved by March 24, 2026, but the schedule and allocations can be altered based on the results of several special studies required in the TMDL implementation plan.

Department's OC Pesticides & PCBs Contribution (relative contribution to pollutant loading)

The Department's relative pesticide and PCB contribution is not known.

Calleguas Creek and its Tributaries & Mugu Lagoon Metals and Selenium TMDL, March 26, 2007

Final Metals WLAs

Urban storm water runoff was identified as a source for metals pollution in the TMDL. The Department shares group WLAs for nickel, copper and selenium with other Permitted Storm water Dischargers (PSDs). Concentration-based interim limits for nickel, copper and selenium are effective from the date of the TMDL for all PSDs. Final WLAs are mass-based.

There are final WLAs for both dry-weather and wet-weather conditions. The dry-weather WLAs apply to days when flows in the stream are less than the 86th percentile flow rate for each reach. The wet-weather WLAs apply to days when flows in the stream exceed the 86th percentile flow rate for each reach. Dry weather limits are based on chronic California Toxics Rule (CTR) criteria. Wet weather limits are based on acute CTR criteria.

Interim Concentration-based Wet and Dry Weather Limits

Metal	Calleguas and Conejo Creek			Revolon Slough		
	Dry CMC µg/L	Dry CCC µg/L	Wet CMC µg/L	Dry CMC µg/L	Dry CCC µg/L	Wet CMC µg/L
Copper	23	19	204	23	19	204
Nickel	15	13	*	15	13	*

* The current loads do not exceed the TMDL under wet conditions: interim limits not required

Final Mass-based Dry-weather WLAs, lbs/day, Total Recoverable Metal in Water Column

Metal	Calleguas and Conejo Creek			Revolon Slough		
	Low	Average	Elevated	Low	Average	Elevated
Copper (lbs/day)	0.04 * WER – 0.02	0.12 * WER – 0.02	0.18 * WER – 0.03	0.03 * WER – 0.01	0.06 * WER – 0.03	0.13 * WER – 0.02
Nickel (lbs/day)	0.100	0.120	0.440	0.050	0.069	0.116

Final Mass-based Wet-weather WLAs, lbs/day, total recoverable metal in water column

Metal	Calleguas Creek	Revolon Slough
Copper (lbs/day)	$(0.00054*Q^2 + 0.032*Q - 0.17)*WER - 0.06$	$(0.0002*Q^2 + 0.0005*Q)*WER$
Nickel (lbs/day)	$0.014*Q^2 + 0.82*Q$	$0.027*Q^2 + 0.47*Q$

A WER is applied to final numeric targets for copper for the Mugu Lagoon, Calleguas Creek 2, and Revolon/Beardsley reaches; the WER defaults to a value of one (1) unless a site-specific study is approved. The mass-based WLAs apply to the Permitted Storm water Dischargers as a group, and the Department has no specific proportional WLA.

Final Metals WLA Specific to the Department

The WLAs above apply to all permitted storm water dischargers, including the Department. The Department has no specific final WLAs.

Final Metals Deadlines

All PSDs have required interim reductions of 25 percent and 50 percent by March 26, 2012 and March 26, 2017, respectively. The final WLAs must be achieved within 15 years after the effective date of the amendment (March 26, 2022). Implementation shall be achieved through BMPs. The Department was originally tasked with submitting an Urban Water Quality Control Plan by March 26, 2012. Implementation is meant to be achieved using BMPs. The Department was required to conduct a source control study and submit an

Urban Water Quality Management Program for copper, nickel, selenium and mercury by March 26, 2009.

Department’s Metals Contribution (relative contribution to pollutant loading)
 The Department’s contribution to the metal loads is unknown.

Colorado Lagoon OC Pesticides, PCBs, Sediment Toxicity, PAHs and Metals TMDL, June 14, 2011

The TMDL identifies the point sources of OC pesticides, PCBs, PAHs, and metals discharged to Colorado Lagoon are urban runoff and storm water discharges from the MS4 and the Department. The Colorado Lagoon watershed is divided into five sub-basins that discharge storm water and urban dry weather runoff to Colorado Lagoon. Each of the sub-basins is served by a major storm sewer trunk line and supporting appurtenances that collect and transport storm water and urban dry weather runoff to Colorado Lagoon.

Final WLAS for OC Pesticides, PCBs, and PAHs

The Department and the City of Long Beach shall each be responsible for achieving the following final mass-based WLAs assigned to the Line I Storm Drain as it conveys storm water from both the Department’s facilities and the City of Long Beach:

Final Mass-based WLA for MS4 Discharges

Total Chlordane	Dieldrin (mg/yr)	Total PAHs (mg/yr)	Total PCBs (mg/yr)	Total DDTs (mg/yr)
3.65	0.15	29,321.50	165.49	11.52

In addition, concentration-based WLAs for sediment are assigned to MS4 permittees including the City of Long Beach, LACFCD, and the Department. Concentration-based WLAs for sediment are applied as average monthly limits. Compliance with the concentration-based WLAs for sediment shall be determined by pollutant concentrations in the sediment in the lagoon at points in the West Arm, North Arm, and Central Arm that represent the cumulative inputs from the MS4 drainage system to the lagoon. Concentration-based interim WLAs for sediment are set to allow time for removal of contaminated sediment through proposed implementation actions. Interim WLAs are based on the 95th percentile value of sediment data collected from 2000-2008. The following interim and final WLAs will be included in MS4 permits in accordance with NPDES guidance and requirements:

Concentration-based WLAs

Pollutants	Interim WLAs (µg/dry kg)	Final WLAs (µg/dry kg)
Total Chlordane	129.65	0.50
Dieldrin	26.20	0.02
Total PAHs	4,022	4,022
Total PCBs	89.90	22.7
Total DDTs	149.80	1.58

Final WLAs for Metals

The Department is jointly responsible with the City of Long Beach in attaining final mass-based WLAs for lead and zinc in sediment and storm water conveyed to Colorado Lagoon via the Line I Storm Drain. In addition, concentration-based interim limits are established for all storm water dischargers, including the Department.

Interim Concentration-based WLAs for Metals in Sediment

Metal	Average Monthly Sediment	
	Interim WLA (µg/kg)	Final WLA (µg/kg)
Lead	399,500	46,700
Zinc	565,000	150,000

Final Mass-based WLAs for Metals in Line I Storm Drain

Metal	mg/yr
Lead	340,455.99
Zinc	1,093,541.72

Proposed BMPs that may apply to the Line I Storm Drain include:
 Low-flow diversion, trash separation devices, vegetated bioswales, cleaning of existing culverts, or direct removal of accumulated sediment

Final OC Pesticides, PCBs & PAHs WLA Specific to the Department

See tables above.

Final OC Pesticides, PCBs & PAHs Deadlines

The Department is subject to the prescribed point source interim WLAs which are effective as of July 28, 2011. Compliance with all final WLAs is required by July 28, 2018.

The Department's OC Pesticides, PCBs & PAHs Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the OC Pesticides, PCBs, and PAHs pollutant loading is not known.

Dominguez Channel and Greater Los Angeles and Long Beach Harbor Toxic Pollutants TMDL, March 23, 2012

The toxic pollutants included in this TMDL include Copper, lead, zinc, DDT, PAHs, and PCBs.

Final WLAs for OC Pesticides PCBs, and PAHs

Interim and final WLA are assigned to storm water discharges including those from the Department’s MS4. Dominguez Channel freshwater allocations are set for wet weather only because exceedances have only been observed in wet weather. Mass-based allocations have been set where sufficient data was available to calculate mass-based allocations; otherwise, concentration-based allocations have been set. Interim and final WLAs shall be included in permits in accordance with state and federal regulations and guidance.

An interim freshwater toxicity allocation of two chronic toxicity units (TUc) applies to all point sources to Dominguez Channel during wet weather including the Department. A final freshwater toxicity allocation of one (1) TUc applies to all point sources to Dominguez Channel during wet weather including the Department.

Interim sediment allocations for Dominguez Channel Estuary and greater Los Angeles and Long Beach Harbor waters are assigned to storm water discharges based on the 95th percentile of sediment data collected from 1998-2006. The final mass-based allocations for PAHs expressed as an annual loading (kilograms/year) of pollutants in the sediment deposited to the Dominguez Channel Estuary, Los Angeles River Estuary, and the Greater Los Angeles and Long beach Harbor Waters. The final mass-based allocations for Total DDT and Total PCBs, expressed annual loading (grams/year) of pollutants in the sediment deposited to the Dominguez Channel Estuary, Los Angeles River Estuary, and the Greater Los Angeles and Long Beach Harbor Waters.

OC Pesticides PCBs, and PAHs Interim and Final WLAs

Interim Concentration-Based Sediment Allocations			
	Total PAHs (mg/kg)	Total DDTs (mg/kg)	Total PCBs (mg/kg)
Dominguez Channel Estuary	31.60	1.727	1.490
Long Beach Inner Harbor	4.58	0.070	0.060
Los Angeles Inner Harbor	90.30	0.341	2.107
Long Beach Outer Harbor	4,022	0.075	0.248
Los Angeles Outer Harbor	4,022	0.097	0.310
Los Angeles River Estuary	4.36	0.254	0.683
San Pedro Bay	4,022	0.057	0.193
Cabrillo Marina	36.12	0.186	0.199
Consolidated Slop	386.00	1.724	1.920
Cabrillo Beach Area	4,022	0.145	0.033
Fish Harbor	2102.7	40.5	36.6

Final Mass-Based Sediment Allocations for the Department			
	Total PAHs (kg/yr)	Total DDTs (g/yr)	Total PCBs (g/yr)
Dominguez Channel Estuary	0.0023	0.004	0.004
Consolidated Slip	0.00009	0.00014	0.00006
Inner Harbor	0.0017	0.0010	0.0011
Outer Harbor	0.00021	0.000010	0.00004
Fish Harbor	0.000021	0.0000010	0.000006
Cabrillo Marina	0.0000016	0.00000028	0.00000024
San Pedro Bay	0.077	0.002	0.019
LA River Estuary	0.333	0.014	0.047

Final Concentration-based Sediment WLAs for Other Bioaccumulative Compounds (dry sediment)		
Total Chlordane (µg/kg)	Dieldrin (µg/kg)	Toxaphene (µg/kg)
0.5	0.02	0.10

Final OC Pesticides PCBs, and PAHs WLAs for Metals

Interim and final WLAs for copper, lead and zinc are assigned to storm water discharges including those from the Department's MS4. Freshwater allocations for Dominguez Channel are set for wet weather only because exceedances have only been observed in wet weather. Wet weather conditions in Dominguez Channel and all of its upstream tributaries apply to any day when the maximum daily flow is greater than 62.7 cfs at any point in Dominguez Channel. Mass-based allocations have been set where sufficient data were available to calculate mass-based allocations; otherwise, WLAs are concentration-based.

Interim allocations for Dominguez Channel and Torrance Lateral are assigned to storm water dischargers, including the Department, and are based on the 95th percentile of total metals data collected from January 2006 to January 2010 using a log-normal distribution. Interim sediment allocations for Dominguez Channel Estuary and greater Los Angeles and Long Beach Harbor waters are assigned to storm water discharges based on the 95th percentile of sediment data collected from 1998-2006.

Interim Concentration-Based WLAs for Dominguez Channel and Torrance Lateral

Total Copper (µg/L)	Total Lead (µg/L)	Total Zinc (µg/L)
207.51	122.88	898.87

Interim Concentration-Based Sediment Allocations (mg/kg sediment)

Waterbody	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Dominguez Channel Estuary	220.0	510.0	789.0
Long Beach Inner Harbor	142.3	50.4	240.6
Los Angeles Inner Harbor	154.1	145.5	362.0
Long Beach Outer Harbor	67.3	46.7	150
Los Angeles Outer Harbor	104.1	46.7	150
Los Angeles River Estuary	53.0	46.7	183.5
San Pedro Bay	76.9	66.6	263.1
Cabrillo Marina	367.6	72.6	281.8
Consolidated Slip	1470.0	1100.0	1705.0
Cabrillo Beach Area	129.7	46.7	163.1
Fish Harbor	558.6	116.5	430.5

Wet-weather freshwater metals allocations are assigned to Dominguez Channel and all of its upstream reaches and tributaries above Vermont Avenue. Mass-based (grams/day) WLAs are divided between the Department and other MS4 permittees by subtracting the other storm water or NPDES WLAs, air deposition and margin of safety from the total loading capacity. Metals targets used to calculate these WLAs were based on an assumed hardness of 50 mg/L and 90th percentile annual flow rates for Dominguez Channel (62.7 cfs).

The Department's Final mass-based water WLAs for Dominguez Channel

Total Copper	Total Lead	Total Zinc
32.3 (g/day)	142.6 (g/day)	232.6 (g/day)

For the Torrance Lateral subwatershed, concentration-based freshwater WLAs for both water and sediment are assigned to all dischargers, including the Department. Metals targets used to calculate these WLAs were based on an assumed hardness of 50 mg/L and 90th percentile annual flow rates.

The Department's Final concentration-based WLAs for Torrance Lateral

Media (units)	Total Copper	Total Lead	Total Zinc
Water (µg/L, unfiltered)	9.7	42.7	69.7
Sediment (mg/kg, dry)	31.6	35.8	121

The final mass-based allocations for metals are expressed as an annual loading (kilograms/year) of pollutants in the sediment deposited to the Dominguez Channel Estuary, Los Angeles River Estuary, and the Greater Los Angeles and Long Beach Harbor Waters. The Interim and Final WLAs are:

Reach	Total Copper (kg/yr)	Total Lead (kg/yr)	Total Zinc (kg/yr)
Dominguez Channel Estuary	0.384	0.93	4.7
Consolidated Slip	0.043	0.058	0.5

Reach	Total Copper (kg/yr)	Total Lead (kg/yr)	Total Zinc (kg/yr)
Inner Harbor	0.032	0.641	2.18
Outer Harbor	0.0018	0.052	0.162
Fish Harbor	0.0000005	0.00175	0.0053
Cabrillo Marina	0.00019	0.0028	0.007
San Pedro Bay	0.88	2.39	9.29
LA River Estuary	5.1	9.5	34.8

In addition to the above, Fish Harbor is impaired for mercury in sediments, Consolidated Slip is impaired for mercury, cadmium and chromium in sediments and Dominguez Channel Estuary is impaired for cadmium in sediments. These waterbodies are assigned no interim WLAs but are assigned final concentration-based WLAs. The Department is NOT named as a responsible party for WLAs to Consolidated Slip.

Final concentration-based sediment WLAs for other metals, dry sediment

Reach	Cadmium mg/kg	Chromium mg/kg	Mercury mg/kg
Dominguez Channel Estuary	1.2	-	-
Fish Harbor	-	-	0.15

Note: The Department is NOT specifically named as a responsible party for implementation actions to Dominguez Channel proper in the 1st Phase of implementation to reduce the amount of sediment transport from point sources that directly or indirectly discharge to the Dominguez Channel and the Harbor waters, even though it has specific WLAs.

Final Toxic Pollutant WLA Specific to the Department

See tables above.

Final Toxic Pollutant Deadlines

The Department is subject to the prescribed point source interim WLAs which are effective as of March 23, 2012. Compliance with all final WLAs is required by March 23, 2032.

Department's Toxic Pollutant Contribution (relative contribution to pollutant *loading*)

The Department's relative contribution to the toxic pollutant loading is not known.

Los Angeles Area Lakes for Organochlorine Pesticides and PCBs

To assess compliance with the organochlorine (OC) compounds TMDLs, monitoring should include monitoring of fish tissue at least every three years as well as once yearly sediment and water column sampling. For the OC pesticides and PCBs TMDLs a demonstration that fish tissue targets have been met in any given year must at minimum include a composite sample of skin off fillets from at least five common carp each measuring at least 350mm in length. At a minimum, compliance monitoring should measure the following in-lake water quality parameters: total suspended sediments, total PCBs, total chlordane, dieldrin, and total DDTs; as well as the following in-lake sediment parameters: total organic carbon, total PCBs, total chlordane, dieldrin, and total DDTs. WLAs are assigned to storm water inputs.

These sources should be measured near the point where they enter the lakes once a year during a wet weather event. Sampling should be designed to collect sufficient volumes of suspended solids to allow for the analysis of at minimum: total organic carbon, total suspended solids, total PCBs, total chlordane, dieldrin, and total DDTs. Measurements of the temperature, dissolved oxygen, pH and electrical conductivity should also be taken.

U.S. EPA established TMDLs do not include implementation plans so all WLAs are considered in effect as of the approval date.

Los Angeles Area (Echo Park Lake) Nitrogen, Phosphorus, Chlordane, Dieldrin, and Trash TMDLs, U.S. EPA Established on March 26, 2012

The entire watershed of Echo Park Lake is contained in MS4 jurisdictions, and watershed loads are therefore assigned WLAs. The Department's areas and facilities that operate under a general industrial storm water permit also receive WLAs. There are TMDLs for PCBs, Chlordane, and Dieldrin, and each has specific WLAs for the Department which are detailed below. The TMDLs have two sets of WLAs, one of which relies on meeting various fish tissue targets that would supersede the initial set of WLAs. Each WLA must be met at the point of discharge.

Final WLAs

PCBs WLA

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (µg/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	1.77	0.17
Southern	Department	State Highway Storm water	1.77	0.17

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	59.8	0.17
Southern	Department	State Highway Storm water	59.8	0.17

Total Chlordane TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	2.10	0.59
Southern	Department	State Highway Storm water	2.10	0.59

If Fish Tissue Targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	3.24	0.59
Southern	Department	State Highway Storm water	3.24	0.59

Dieldrin TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	0.80	0.14
Southern	Department	State Highway Storm water	0.80	0.14

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	1.90	0.14
Southern	Department	State Highway Storm water	1.90	0.14

Final OC Compounds WLA Specific to the Department

See tables above.

Final OC Compounds Deadlines

U.S. EPA did not establish deadlines.

Department's OC Compounds Contribution (relative contribution to pollutant loading)
 The Department's relative contribution to the OC Pesticide pollutant loading is unknown.

Los Angeles Area (Peck Road Park Lake) Nitrogen, Phosphorus, Chlordane, DDT, Dieldrin, PCBs, and Trash

Final OC Compounds WLA

The entire watershed of Peck Road Park Lake is contained in MS4 jurisdictions, and watershed loads are therefore assigned WLAs. The Department areas and facilities that operate under a general industrial storm water permit also receive WLAs. There are TMDLs for PCBs, Chlordane, DDTs, and Dieldrin and each has specific WLAs for the Department which are detailed below. The TMDLs have two sets of WLAs, one of which relies on meeting various fish tissue targets that would supersede the initial set of WLAs. Each WLA must be met at the point of discharge.

Final OC Compounds WLA Specific to the Department

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	1.29	0.17
Western	Department	State Highway Storm water	1.29	0.17

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	59.8	0.17
Western	Department	State Highway Storm water	59.8	0.17

Total Chlordane TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	1.73	0.59
Western	Department	State Highway Storm water	1.73	0.59

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	3.24	0.59
Western	Department	State Highway Storm water	3.24	0.59

Total DDTs TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	5.28	0.59
Western	Department	State Highway Storm water	5.28	0.59

Dieldrin TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	0.43	0.14
Western	Department	State Highway Storm water	0.43	0.14

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Eastern	Department	State Highway Storm water	1.90	0.14
Western	Department	State Highway Storm water	1.90	0.14

Final OC Compounds WLA Specific to the Department

See tables above.

Final OC Compounds Deadlines

U.S. EPA did not establish deadlines.

Department's OC Compounds Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the OC Pesticides and PCBs pollutant loading is not known.

Los Angeles Area (Puddingstone Reservoir) Nitrogen, Phosphorus, Chlordane, DDT, PCBs, Mercury, and Dieldrin TMDLs, U.S. EPA Established on March 26, 2012

Final OC Compounds WLA

In the Puddingstone Reservoir watershed, WLAs are required for all permittees in the northern subwatershed and the Department's areas in the southern subwatershed. There are TMDLs for PCBs, Chlordane, DDTs, and Dieldrin and each has specific WLAs for the Department which are detailed below.

Final OC Compounds WLA Specific to the Department

The TMDLs have two sets of WLAs, one of which relies on meeting various fish tissue targets that would supersede the initial set of WLAs. Each WLA must be met at the point of discharge.

Total PCBs TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	0.59	0.17
Southern	Department	State Highway Storm water	0.59	0.17

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	59.8	0.17
Southern	Department	State Highway Storm water	59.8	0.17

Total Chlordane TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	0.75	0.57
Southern	Department	State Highway Storm water	0.75	0.57

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	3.24	0.57
Southern	Department	State Highway Storm water	3.24	0.57

Total DDTs TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	3.94	0.59
Southern	Department	State Highway Storm water	3.94	0.59

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	5.28	0.59
Southern	Department	State Highway Storm water	5.28	0.59

Dieldrin TMDL

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	0.22	0.14
Southern	Department	State Highway Storm water	0.22	0.14

If the Fish Tissue targets are met:

Subwatershed	Responsible Jurisdiction	Input	Suspended Sediment WLAs (ug/kg dry weight)	Water Column WLAs (ng/L)
Northern	Department	State Highway Storm water	1.90	0.14
Southern	Department	State Highway Storm water	1.90	0.14

Final OC Compounds WLA Specific to the Department

See tables above.

Final OC Compounds Deadlines

U.S. EPA did not establish deadlines.

Department's OC Compounds *Contribution* (relative contribution to pollutant loading)

The Department's relative contribution to pollutant loading is not known.

Los Angeles River Watershed Metals TMDL, September 6, 2007

Final Metals WLA

This TMDL includes wet-weather and dry-weather WLAs for copper, lead, and zinc. Wet-weather conditions are when the maximum daily flow of the Los Angeles River is greater than or equal to 500 cfs. Dry-weather conditions are where maximum daily flow is less than 500 cfs; critical flows are also listed for each of the reaches in this TMDL.

Final Metals WLA Specific to the Department

For dry-weather conditions, the Department is assigned grouped WLAs with other MS4 permittees.

WERs are explicitly included in these WLAs, but default to a value of 1 (unit less) unless site-specific values are approved by the Regional Water Board. Concentration-based limits are also allowed for dry weather due to the expense of obtaining accurate flow measurements; in this case, the concentration-based limits are equal to dry-weather reach-specific dry-weather numeric targets.

Final Mass-based Dry-weather WLAs for Storm water and MS4s, Total Recoverable Metals

Waterbody	Critical Flow (CFS)	Copper (kg/day)	Lead (kg/day)	Zinc (kg/day)
LAR 6	7.20	0.53 x WER	0.33 x WER	-
LAR 5	0.75	0.05 x WER	0.03 x WER	-
LAR 4	5.13	0.32 x WER	0.12 x WER	-

Waterbody	Critical Flow (CFS)	Copper (kg/day)	Lead (kg/day)	Zinc (kg/day)
LAR 3	4.84	0.06 x WER	0.03 x WER	-
LAR 2	3.86	0.13 x WER	0.07 x WER	-
LAR 1	2.58	0.14 x WER	0.07 x WER	-
Bell Creek	0.79	0.06 x WER	0.04 x WER	-
Tujunga Wash	0.03	0.001x WER	0.0002xWER	-
Burbank Channel	3.3	0.15 x WER	0.07 x WER	-
Verdugo Wash	3.3	0.18 x WER	0.10 x WER	-
Arroyo Seco	0.25	0.01 x WER	0.01 x WER	-
Rio Hondo Reach 1	0.50	0.01 x WER	0.006 x WER	0.16 x WER
Compton Creek	0.90	0.04 x WER	0.02 x WER	-

Note: All WERs are equal to 1 (unit less)

Final Concentration-based reach-specific numeric targets, total recoverable metals

Waterbody	Copper (µg/L)	Lead (µg/L)	Zinc (µg/L)
LA River Reach 6	WER ¹ * 30	WER ¹ * 19	-
LA River Reach 5	WER ¹ * 30	WER ¹ * 19	-
LA River Reach 4	WER ² * 26	WER ¹ * 10	-
LA River Reach 3 above LA-Glendale WRP	WER ² * 23	WER ¹ * 12	-
LA River Reach 3 below LA-Glendale WRP	WER ² * 26	WER ¹ * 12	-
LA River Reach 2	WER ² * 22	WER ¹ * 11	-
LA River Reach 1	WER ² * 23	WER ¹ * 12	-
Bell Creek	WER ¹ * 30	WER ¹ * 19	-
Burbank Western Channel (above WRP)	WER ² * 26	WER ¹ * 14	-
Burbank Western Channel (below WRP)	WER ² * 19	WER ¹ * 9.1	-
Verdugo Wash	WER ² * 23	WER ¹ * 12	-
Compton Creek	WER ¹ * 19	WER ¹ * 8.9	-
Arroyo Seco	WER ² * 22	WER ¹ * 11	-
Rio Hondo Reach 1	WER ¹ * 13	WER ¹ * 5.0	WER ¹ * 131
Monrovia Canyon	-	WER ¹ * 8.2	-

Note:
¹ WER is equal to 1 (unit less)
² WER for this constituent in this reach is 3.96

Wet-weather allocations are apportioned among storm water permit holders based on percent area of the watershed served by storm drains.

Final Mass-based wet-weather WLAs, Total Recoverable Metals

Metal	Waste Load Allocation (kg/day) Total Recoverable
Cadmium	WER * 5.3 * 10 ⁻¹¹ * daily volume (L) – 0.03
Copper	WER * 2.9 * 10 ⁻¹⁰ * daily volume (L) – 0.2
Lead	WER * 1.06 * 10 ⁻⁰⁹ * daily volume (L) – 0.07
Zinc	WER * 2.7 * 10 ⁻⁰⁹ * daily volume (L) – 1.6

Final Metals Deadlines

By January 11, 2024, the jurisdictional group shall demonstrate that 100 percent of the group’s total drainage area served by the storm drain system is effectively meeting the dry-weather WLAs and 50 percent of the group’s total drainage area served by the storm drain system is effectively meeting the wet-weather WLAs. By January 11, 2028, the jurisdictional group shall demonstrate that 100 percent of the group’s total drainage area served by the storm drain system is effectively meeting both the dry-weather and wet-weather WLAs. MS4s and the Department may meet the TMDL using a phased implementation approach using a combination of structural and non-structural BMPs.

Department’s Metals Contribution (relative contribution to pollutant loading)

Unknown

Los Cerritos Channel Metals TMDL, March 17, 2010

Final Metals WLA

This TMDL assigns the Department wet-weather WLAs for copper, lead and zinc and a dry-weather WLA for copper only. Wet weather is defined as where the maximum daily flow of Los Cerritos Channel is greater than 23 cfs, and dry weather is where the maximum daily flow of the Channel is less than 23 cfs. For dry-weather copper targets, a site-specific translator was used, defined as the median value of the ratio of direct measurements to CTR criteria. Only the Department and other MS4s have a mass-based WLA for copper for dry weather, and this is divided among permittees based on estimates of respective percentage of total watershed area.

Final mass-based wet-weather WLAs are divided among the Department, other MS4 permittees, General Construction permittees and General Industrial permittees based on an estimate of the percentage of land area covered under each permit. The Department’s estimated percent area of the watershed is 0.8 percent.

Final Metals WLA Specific to the Department

Copper Dry-weather WLA, Total Recoverable Metal	
Copper	1.0 g/day

Metals Wet-weather WLAs, Total Recoverable Metal (V is daily flow volume in liters)		
Copper g/day	Lead g/day	Zinc g/day
$0.070 * V * 10^{-6}$	$0.397 * V * 10^{-6}$	$0.680 * V * 10^{-6}$

Final Metals Deadlines

U.S. EPA did not include implementation measures for the TMDL, and as such implementation procedures are the responsibility of the Los Angeles Regional Water Board. Implementation measures for this TMDL are currently being developed by the Los Angeles Regional Water Board.

Department's Metals Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the metals pollutant loading is not known.

Machado Lake Pesticides and PCBs TMDL, March 20, 2012

The point sources of pesticides and PCBs into Machado Lake are storm water and urban runoff discharges including those from the Department's MS4. Storm water and urban runoff dischargers to Machado Lake occur through the following sub-drainage systems: Wilmington Drain, Project 77 and Project 510.

Final Pesticides and PCBs WLA

The following WLAs apply to all point sources:

Pollutants	WLAs (ug/kg dry weight)
Total PCBs	59.8
DDT (all congeners)	4.16
DDE (all congeners)	3.16
DDD (all congeners)	4.88
Total DDT	5.28
Total Chlordane	3.24
Dieldrin	1.9

Final Pesticides and PCBs WLA Specific to the Department

See table above.

Final Pesticides and PCBs Deadlines

The TMDL WLAs are applied with a three-year averaging period and shall be incorporated into MS4 permits, including the Department's MS4 permit, and general construction and industrial storm water NPDES permits and any other non-storm water NPDES permits.

Storm water dischargers may coordinate compliance with the TMDL. Permitted storm water dischargers can implement a variety of implementation strategies to meet the required WLAs, such as non-structural and structural BMPs, and/or diversion and treatment to reduce sediment transport from the watershed to the lake. Compliance with the TMDL may be based on a coordinated Monitoring and Reporting Program. The Department is subject to the prescribed point source WLAs with a final compliance date of September 30, 2019.

Department’s Pesticides and PCBs Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to the OC Pesticides and PCBs pollutant loading is not known.

Marina Del Rey Harbor Toxics Pollutants TMDL, March 26, 2006

Final Toxic Pollutant WLAs

The Department is assigned mass-based WLAs for copper, lead and zinc along with other storm water permittees in the watershed. The Copper, Lead, and Zinc WLAs are apportioned between the permittees based on an estimate of the percentage of land area covered under each permit.

Total Mass-based Storm Water Metal WLAs:

Copper (kg/yr)	Lead (kg/yr)	Zinc (kg/year)
2.06	2.83	9.11

Total Mass-based Storm Water Organics WLAs:

Total Chlordane (g/yr)	Total PCBs (g/yr)
0.03	1.38

Final Toxic Pollutants WLAs Specific to the Department

Mass-based Metals WLAs for Caltrans

Copper (kg/yr)	Lead (kg/yr)	Zinc (kg/year)
0.022	0.03	0.096

Mass-based Organics WLAs for the Department:

Total Chlordane (g/yr)	Total PCBs (g/yr)
0.0003	0.015

Final Toxic Pollutant Deadlines

The implementation schedule for the MS4 permittees and the Department consists of a phased approach. A combination of non-structural and structural BMPs may be used to achieve compliance with the WLAs, with compliance to be achieved in prescribed percentages of the watershed. Total compliance is to be achieved within 10 years or March 22, 2016. However, the Regional Board may extend the implementation period up to 15 years or March 22, 2021, if an integrated water resources approach is employed.

Department Toxic Pollutant Contribution (relative contribution to pollutant loading)

The Department is assigned approximately one percent of the WLA for each pollutant, based on an estimate of area within the watershed.

San Gabriel River Metals & Selenium TMDL, U.S. EPA Established on March 26, 2007

Final Metals WLA

The Department is assigned WLAs for dry-weather and wet-weather for copper, lead and zinc (as well as selenium). For San Gabriel River Reach 2, the critical flow for wet weather is 260 cfs; for Coyote Creek, the critical flow is 156 cfs. The combined storm water WLA is allocated to individual permits based on percent area of the developed portion of the watershed.

For dry-weather copper, all MS4 storm water permittees, including the Department, are assigned concentration-based WLAs specific to San Gabriel River Reach 1, Coyote Creek, and the San Gabriel River Estuary.

Dry-weather Concentration-Based Copper WLAs for Storm water Permittees

Waterbody	Concentration-based WLA (µg/L)
Estuary	3.7
San Gabriel Reach 1	18
Coyote Creek	20

The TMDL establishes wet-weather WLAs to San Gabriel River Reach 2 for lead, and the Department is part of a grouped mass-based WLA. For Coyote Creek, mass-based WLAs are applied to copper, lead, and zinc. These WLAs are further divided among municipal storm water, industrial storm water, and construction storm water permits that are expressed as an area-based proportion of the total WLA. The Department and other MS4s share WLAs because there are not enough data on the relative reach-specific extent of these permittees' areas. The mass-based WLAs for the grouped Department's and MS4s are defined as the

daily storm volume times the numeric target of the metal for the waterbody times the estimated percentage of watershed covered by these permits.

WLAs for San Gabriel River Reach 2, Coyote Creek and to all of their respective Tributaries

Reach	Copper (kg/day)	Lead (kg/day)	Zinc (kg/day)
San Gabriel Reach 2	--	Daily storm vol * 166 µg/L * 49%	--
Coyote Creek	Daily storm vol * 27 µg/L * 91.5%	Daily storm vol * 106 µg/L * 91.5%	Daily storm vol * 158 µg/L * 91.5%

Final Metals WLA Specific to the Department

No specific WLAs.

Final Metals Deadlines

U.S. EPA did not include implementation measures for the TMDL, and implementation procedures are the responsibility of the Los Angeles Regional Water Board. Implementation measures or this TMDL are currently being developed by the Los Angeles Regional Water Board.

Department’s Metals Contribution (relative contribution to pollutant loading)

The Department’s contribution to the metals loads is not known.

Santa Monica Bay PCBs and DDTs TMDLs, U.S. EPA Established on March 26, 2012

Final PCBs and DDTs WLA

The grouped WLAs are apportioned to the Los Angeles County MS4 permit, the Department’s MS4 permit, and enrollees under the general construction and industrial storm water permits. Mass-based WLAs are to be partitioned among the four groups based on the percent area of each major group in the watersheds draining to Santa Monica Bay. Permittees covered under the general construction and storm water permittees are not expected to perform individual sampling; instead, monitoring should be conducted on a coordinated, watershed-wide basis consistent with the WLAs in the TMDL. The establishment of watershed efforts to identify and address sources of DDTs and PCBs within the watersheds and reporting of the total storm water loadings of DDT and PCB to Santa Monica Bay is encouraged.

The analysis of DDT and PCBs on suspended particle loadings from the mass emission stations will provide more robust measures of mass loadings. If additional data indicate that existing storm water loadings differ from the storm water WLAs defined in the TMDL, the Los Angeles Regional Water Board should consider re-opening the TMDL to better reflect actual loadings.

BMPs and pollutant removal are the most suitable courses of action to reduce DDT and PCBs in the Santa Monica Bay Watershed. Attention should be focused on those watersheds with the highest potential loadings to Santa Monica Bay, such as those that are more heavily urbanized. BMPs should also be targeted to reduce potential PCB loads from industrial and construction runoff as studies have shown that these may be a major source of PCBs. U.S. EPA also recommends implementation of a PCB Source Identification and Control program within storm water permits to evaluate and identify controllable sources of PCBs.

Final PCBs and DDT WLAs Specific to the Department

Final PCBs and DDTs WLAs

Total PCBs (g/yr)	Total DDTs (g/yr)
3.9	0.75

Final PCBs and DDTs Deadlines

U.S. EPA recommends that storm water WLAs be evaluated based on a three year averaging period. This will provide more robust assessment for compliance and should smooth out variability due to wet years. This is consistent with timeframes provided for the Los Angeles Harbor/Long Beach TMDL.

Department’s PCBs and DDTs Contribution (relative contribution to pollutant loading)

The footprint of the Department’s MS4 is 2.7 percent of the area within the Santa Monica Bay watersheds.

SANTA ANA REGION METALS/TOXICS/PESTICIDES TMDLS

Rhine Channel Area of Lower Newport Bay Chromium and Mercury, U.S. EPA Established on June 14, 2002

Final Chromium WLA

For Rhine Channel, the final Chromium WLA is 7.44 kg/yr in sediment.

Final Chromium WLA Specific to the Department

The final mass-based Chromium WLA for the Department is 0.89 kilograms/year in sediment.

Final Chromium Deadlines

The Santa Ana Regional Water Board anticipated a Basin Plan Amendment addressing implementation of the above TMDLs in 2007; these amendments have not yet been completed.

Department’s Chromium Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the Chromium loading is approximately three percent of the total, based on area.

San Diego Creek and Newport Bay, including Rhine Channel Metals (Copper and Zinc) TMDL, U.S. EPA Established on June 14, 2002

Final Metals WLA

WLAs are established for cadmium, copper, lead and zinc in the San Diego Creek watershed, for cadmium, copper, lead and zinc in Newport Bay, and for cadmium, copper, lead, zinc and chromium (and mercury) in Rhine Channel. San Diego Creek is a fresh water stream, while Newport Bay and Rhine Channel are saltwater.

Final Metals WLA Specific to the Department

For San Diego Creek, the Department is assigned concentration-based WLAs for cadmium, copper, lead, and zinc. There are no wet-weather or dry-weather WLAs, but there are four sets of WLAs for each metal for four different flow tiers. All flow tiers have an acute and chronic WLA, except for the highest flow tier, which only has an acute WLA.

Concentration-based WLAs for San Diego Creek Watershed by Flow Tiers, µg/L

Metal	< 20 cfs); H = 400 mg/L		21 – 181 cfs		182 - 815 cfs		> 815 cfs
	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Cu	50	29.3	40	24.3	30.2	18.7	25.5
Pb	281	10.9	224	8.8	162	6.3	134
Zn	379	382	316	318	243	244	208

* Applies to Upper Newport Bay Only

For Newport Bay, mass-based WLAs for cadmium, copper, lead and zinc were assigned to the Department. These WLAs were developed on estimates made using Best Professional Judgment because insufficient data were available to accurately estimate relative contributions to existing loads. The Department's share of the estimated loads is based on the relative proportion of watershed land area among the Department and adjacent permit-holders.

Final mass-based WLAs in Newport Bay, Dissolved Metals

Metal	Cu	Pb	Zn
Total	423 lbs/yr	2,171 lbs/yr	22,866 lbs/yr

Additional concentration-based limits apply only to sources which discharge directly to the Bay, including storm water dischargers from storm drains direction to Bay segments.

Newport Bay Concentration-based Dissolved Metal TMDLs, WLAs/LAs

Metal	Dissolved saltwater Acute TMDLs and allocations (µg/L)	Dissolved saltwater chronic TMDLs and allocations (µg/L)
Cu	4.8	3.1
Pb	210	8.1
Zn	90	81

* Applies to Upper Newport Bay Only

Final Metals Deadlines

U.S. EPA did not include implementation measures for the TMDL.

Department’s Metals Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to the metals pollutant loading is not known.

San Diego Creek and Upper Newport Bay Cadmium TMDL, U.S. EPA Established on June 14, 2002

Final Cadmium WLA

Concentration-based WLAs for San Diego Creek Watershed by Flow Tiers

Metal	< 20 cfs; H = 400 mg/L		21 – 181 cfs		182 - 815 cfs		> 815 cfs
	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Cd (µg/L)	19.1	6.2	15.1	5.3	10.8	4.2	8.9

* Applies to Upper Newport Bay Only

Newport Bay Concentration-based Dissolved Metal TMDLs, WLAs/LAs

Metal	Dissolved saltwater Acute TMDLs and allocations (µg/L)	Dissolved saltwater chronic TMDLs and allocations (µg/L)
Cd	42	9.3

* Applies to Upper Newport Bay Only

Final Cadmium WLA Specific to the Department

See Table above.

Final Cadmium Deadlines

U.S. EPA did not include implementation measures for the TMDL.

Department’s Cadmium Contribution

The Department’s relative contribution to the cadmium pollutant loading is not known.

San Diego Creek Watershed, Organochlorine Compounds and PCBs TMDLs, November 12, 2013

Final OC Compounds WLA

The Department is listed as a primary source of pollutant loads to the San Diego Creek watershed. The mass-based WLAs were expressed as both daily and annual values. Pollutants include Total DDT, Chlordane, Total PCBs and Toxaphene.

WLAs Expressed as a Daily Value (grams/day)					
Watershed	Input	Total DDT	Chlordane	Total PCBs	Toxaphene
San Diego Creek	Department (11%)	0.11	0.07	0.03	0.002
WLAs Expressed as a Annual Value (grams/year)					
Watershed	Input	Total DDT	Chlordane	Total PCBs	Toxaphene
San Diego Creek	Department (11%)	39.2	25.2	12.4	0.6

Final OC Compounds WLA Specific to the Department

See Tables above.

Final OC Compounds Deadlines

Compliance with the TMDLs and WLAs is to be achieved as soon as possible, but no later than December 31, 2020. The way that this deadline applies to a particular discharger differs depending on whether the discharger is participating in the Working Group. Ultimate compliance with permit limitations based on WLAs is expected to be based upon iterative implementation of effective BMPs to manage the discharge of fine sediments containing organochlorine compounds, along with monitoring to measure BMP effectiveness.

Department’s OC Compounds Contribution (relative contribution to pollutant loading)

Based upon the percentage of the total urban land use comprised by Urban-Roads, Department’s facilities and roadways make up 11 percent of the land area and are assigned a proportion of the overall WLAs accordingly.

Upper & Lower Newport Bay Organochlorine Compounds TMDL, November 12, 2013

Final OC Compounds WLA

Upper Newport Bay and Lower Newport Bay OC Compounds WLAs

WLAs Expressed as a Daily Value (grams/day)					
Watershed	Input	Total DDT	Chlordane	Total PCBs	Toxaphene
Upper Newport Bay	Department (11%)	0.04	0.03	0.02	-
Lower Newport Bay	Department (11%)	0.02	0.01	0.07	-

WLAs Expressed as a Annual Value (grams/year)					
Watershed	Input	Total DDT	Chlordane	Total PCBs	Toxaphene
Upper Newport Bay	Department (11%)	15.8	9.2	9.1	-
Lower Newport Bay	Department (11%)	5.8	3.4	23.9	-

Final OC Compounds WLA Specific to the Department

See Tables above.

Final OC Compounds Deadlines

Compliance with the TMDLs and WLAs is to be achieved as soon as possible, but no later than December 31, 2020. The way that this deadline applies to a particular discharger differs depending on whether the discharger is participating in the Working Group. Ultimate compliance with permit limitations based on WLAs is expected to be based upon iterative implementation of effective BMPs to manage the discharge of fine sediments containing organochlorine compounds, along with monitoring to measure BMP effectiveness.

Department's OC Compounds Contribution (relative contribution to pollutant loading)

Based upon the percentage of the total urban land use comprised by Urban-Roads, Department's facilities and roadways make up 11 percent of the land area and are assigned a proportion of the overall WLAs accordingly.

SAN DIEGO REGION METALS TMDL

Chollas Creek Dissolved Copper, Lead and Zinc TMDLs, December 18, 2008

Final Metals WLA

WLAs are concentration-based and set as the acute and chronic limits in the California Toxics Rule times 90 percent for all permitted dischargers, in units of µg/L, as dissolved metals. The final WLAs are based on statistical measures of hardness used in calculating permit requirements.

Final Concentration-based WLAs

Chollas Creek, Copper, Lead, and Zinc WLAs, Dissolved Metal

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration, (µg/L)	Numeric Target for Chronic Conditions: Criteria Continuous Concentration, (µg/L)
Copper	$(1) * (0.96) * \{e^{[0.9422 * \ln(\text{hardness}) - 1.700]}\} * 0.9$	$(1) * (0.96) * \{e^{[0.8545 * \ln(\text{hardness}) - 1.702]}\} * 0.9$
Lead	$(1) * \{1.46203 - [0.145712 * \ln(\text{hardness})]\} * \{e^{[1.273 * \ln(\text{hardness}) - 1.460]}\} * 0.9$	$(1) * \{1.46203 - [0.145712 * \ln(\text{hardness})]\} * \{e^{[1.273 * \ln(\text{hardness}) - 4.705]}\} * 0.9$
Zinc	$(1) * (0.978) * \{e^{[0.8473 * \ln(\text{hardness}) + 0.884]}\} * 0.9$	$(1) * (0.986) * \{e^{[0.8473 * \ln(\text{hardness}) + 0.884]}\} * 0.9$

Final Metals WLA Specific to the Department

There are no WLAs specific to the Department.

Final Metals Deadlines

The Department along with other responsible parties must meet 100 percent of Chollas Creek Metals TMDL WLA reductions by December 18, 2028.

Department's Contribution *(relative contribution to pollutant loading)*

The Department's contribution to the metal loads is not known.

D. Trash TMDL Pollutant Category

General Description of Pollutant Category

As discussed under the ten individual TMDLs below, the TMDLs in the trash pollutant category establish that the Department varies in the significance of a source of trash and debris. The scale of the Department as a source depends on the magnitude and location of the impacted water body and corresponding land uses. For the individual TMDLs, the Department is not the sole responsible party for source of trash and debris. Other point source responsible parties include Los Angeles County MS4 permittees, Ventura County MS4 permittees, and industrial permittees.

Since trash generation rates are dependent on land use, the requirements for the Department in Attachment IV Section III.D.1 focus on significant trash generating areas. These areas include: highway on- and off-ramps in high density residential, commercial and industrial land uses, rest areas and park-and-rides, state highways in commercial and industrial land uses, and mainline highway segments to be identified by the Department through pilot studies and/or surveys. The requirements in Attachment IV are expected to address the highest source of trash from the Department by focusing management practices on the highest problem areas.

Attachment IV Section III.D.1 establishes a prohibition of discharge of trash to receiving waters. All of the individual TMDLs set a numeric target of zero trash, since the receiving water body lacks an assimilative capacity for any piece of the trash. Attaining the numeric target is difficult due to the transport mechanisms of the trash, specifically for the Department whose users are temporary and transitory. Attachment IV Section III.D.2 sets forth two compliance options to achieve the prohibition of discharge. The compliance options focus on implementation of management practices, treatment controls, and institutional controls in the significant trash generating areas and the coordination with neighboring municipalities to implement treatment and institutional controls in significant trash generating areas and priority land use areas (high density residential, industrial, commercial, mixed urban, and public transportation stations).

Sources of Pollutant & How it Enters the Waterway

Trash and debris are the man-made products that are improperly discarded and transported to surface water bodies. Trash is considered a 'gross pollutants' and excludes sediments, oil and grease, and vegetation. Trash can include cigarette butts, paper, fast food containers, plastic grocery bags, cans and bottles, used diapers, construction site debris, industrial plastic pellets, old tires and appliances. Trash and debris cause impairments to beneficial uses of surface water bodies, including rivers, lakes, enclosed bays and estuaries, and ocean waters.

Watershed Contribution

Trash impacts aquatic habitat and life. Mammals, turtles, birds, fish, and crustaceans are threatened following the ingestion or entanglement of trash. Ingestion and entanglement can be fatal for freshwater, estuarine, saline and marine aquatic life. Similarly, habitat alterations and degradations due to trash can make natural habitats unsuitable for spawning, migration, and preservation of aquatic life. These negative effects of trash to aquatic life can impact several beneficial uses. The aquatic life beneficial uses that can be impacted by negative effects of trash include: Warm Freshwater Habitat (WARM); Cold Freshwater habitat (COLD); Inland Saline Water Habitat (SAL); Estuarine Habitat (EST); Marine Habitat (MAR); Wildlife Habitat (WILD); Preservation of Biological Habitats (BIOL); Rare, Threatened, or Endangered Species (RARE); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN); and Wetland Habitat (WET).

Trash impacts human activity by means of jeopardizing public health and safety and posing harm and hindrance in recreational, navigational, and commercial activities. The human

beneficial uses impacted by trash and debris include: Navigation (NAV); Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Commercial and Sport Fishing (COMM); Aquaculture (AQUA); Shellfish Harvesting (SHELL); and Industrial Service Supply (IND).

Trash and debris, which is intentionally or accidentally discarded in watershed drainage areas, enter a water body through a transport mechanism. Transport mechanisms include the following:

1. Storm drains: trash is deposited throughout the watershed and is carried to a water body during and after significant rainstorms through storm drains.
2. Wind/wave action: trash can also blow into the waterways directly.
3. Direct disposal: direct dumping of trash to water body.

The amount and type of trash and debris that is washed into the storm drain system is generally a function of the surrounding land use. It is generally accepted that commercial, industrial, high density residential land use contribute larger loads of gross pollutants per area compared to low residential and open space and park land use areas.

Control Measures

Full capture system is a type of treatment control that is a device or series of devices that traps all particles that are 5 mm or greater and has a design treatment capacity that is not less than the peak flow rate, Q, resulting from a one-year, one-hour, storm in the subdrainage area. For the Department, there are three types of full capture systems that fall under the category of Gross Solids Removal Devices (GSRDs). Gross Solids Removal Devices (GSRDs) were developed by the Department to be retrofitted into existing highway drainage systems or implemented in future highway drainage systems. GSRDs are structures that remove litter and solids five mm and larger from the storm water runoff using various screening technologies. Overflow devices are incorporated, and the usual design of the overflow release device is based upon the design storm for the roadway. Though designed to capture litter, the devices can also capture some of the vegetation debris. The devices shown below are generally limited to accept flows from pipes 30 inches in diameter and smaller.

The three types of potential GSRDs the Department could utilize are linear radial and two versions using an inclined screen. A linear radial device is relatively long and narrow, with flow entering one end and exiting the other end. It is suited for narrow and flat rights-of-way with limited space. It utilizes modular well screen casings with 5 mm louvers and is contained in a concrete vault, although it also could be attached to a headwall at a pipe outfall. While runoff flows enter into the screens, they pass radially through the louvers and trap litter in the casing. A smooth bottom to convey litter to the end of the screen sections is required, so a segment of the circumference of each screen is uncovered. The louvered sections have access doors for cleaning by vacuum truck or other equipment. Under most placement conditions the goal would be to capture within the casing one year's volume of

litter. This device has been configured with an overflow/bypass for larger storm events and if the unit becomes plugged.

Two Inclined Screen Devices have also been developed. Each device requires about 1-meter of hydraulic head and is better suited for fill sections. In the Type 1 device, the storm water runoff flows over the weir and falls through the inclined bar rack. The screen has five-mm maximum spacing between the bars. Flow passes through the screen and exits via the discharge pipe. The trough distributes influent over the inclined screen. Storm water pushes captured litter toward the litter storage area. The gross solids storage area is sloped to drain to prevent standing water. This device has been configured with an overflow/bypass for larger storm events and if the unit becomes plugged. It has a goal of litter capture and storage for one year. The Type 2 Inclined Screen only comes in a sloped sidewall version.

Full capture devices and treatment controls are highly effective to capture and retain trash when properly maintained. However, there are locations that might be infeasible to install treatment controls. The Department may elect to employ institutional controls, which are non-structural best management practices that may include street sweeping and anti-litter education and outreach programs. Street sweeping minimizes trash loading to the river by removing trash from streets and curbs. Maintaining a regular street sweeping schedule reduces the buildup of trash on streets and prevents trash from entering catch basins and the storm drain system. Street sweeping can also improve the appearance of roadways. There are at least three types of street sweepers the Department may employ: 1) mechanical, 2) vacuum filter, and 3) regenerative air sweepers. Public education can be an effective implementation alternative to reduce the amount of trash entering water bodies. The public is often unaware that trash littered on the street ends up in receiving waters, much less the cost of abating it. The Department may elect to continue to participate in educational programs like 'Adopt-A-Highway' and 'Don't Trash California'.

As specified in Attachment IV Section III.D.3, the Department shall submit an annual status report of the selected treatment and institutional control measures implemented to comply with the prohibition of discharge of trash. In addition to the annual status report, the Department should conduct a pilot survey to further determine highway characteristics and sections that should be included in the category of significant trash generating areas. The pilot study will further assure compliance with the prohibition of discharge and reduction of trash to receiving water bodies from high trash generation areas from the Department's jurisdiction.

LOS ANGELES REGION TRASH TMDLS

Ballona Creek Trash TMDL, August 1, 2002 and February 8, 2005

Final WLA

The numeric target for this TMDL is zero trash in the water. Storm drains were identified as a major source of trash. WLAs were assigned to permittees of the Los Angeles County MS4 permit and the Department.

Final WLA Specific to the Department

The Department is assigned the following baseline WLAs of trash.

Weight (lbs/mile ²)	Volume (ft ³ /mile ²)
7479.36	892.64

Final Deadlines

The implementation schedule for the MS4 and the Department permittees consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within twelve years from the effective date of the TMDL (September 30, 2015).

Department's Contribution (relative contribution to pollutant loading)

The Department's Baseline WLA relative to all other point sources (municipal permittees) is 13 percent.

Legg Lake Trash TMDL, February 27, 2008

Final WLA

The numeric target for this TMDL is zero trash in Legg Lake and on the shoreline. Both point sources and nonpoint sources are identified as sources of trash in Legg Lake. WLAs were assigned to the permittees of the Los Angeles County MS4 permit and the Department.

Final Trash WLA Specific to the Department

The Department is assigned the following baseline WLAs assuming a trash generation rate of 6677 (gallons of uncompressed litter per mile² per year).

Point Source Area (mile ²)	Baseline WLA (gal/yr)
0.09	586.92

Final Trash Deadlines

The implementation schedule for the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within eight years from the effective date of the TMDL (March 6, 2016).

Department’s Trash Contribution (relative contribution to pollutant loading)

The Department’s Baseline WLA relative to all other point sources (municipal permittees) is 7.9 percent.

Los Angeles Area (Echo Park Lake) Nitrogen, Phosphorus, Chlordane, Dieldrin, PCBs, and Trash TMDL, March 26, 2012

Final Trash WLA

The numeric target for this TMDL is zero trash in Echo Park Lake and on the shoreline. Both point sources and nonpoint sources are identified as sources of trash. WLAs could be assigned to permittees of the Los Angeles County MS4 permit and the Department.

The Department is estimated to have the following baseline WLAs assuming a trash generation rate of 6,677 (gallons of uncompressed litter per mile² per year).

Point Source Area (mile ²)	Current Point Source Trash Load (gal/yr)
0.022	150

Final Trash WLA Specific to the Department

No WLAs were assigned to the Department.

Final Trash Deadlines

There is no compliance and implementation schedule for the Echo Park Lake Trash TMDL.

Department’s Trash Contribution (relative contribution to pollutant loading)

As there is no assigned WLA, the Department’s contribution to the estimated point source trash loads is 16.7 percent.

Los Angeles Area (Peck Road Park) Lake Nitrogen, Phosphorus, Chlordane, DDT, Dieldrin, PCBs, and Trash TMDL, March 26, 2012

Final Trash WLA

The numeric target for this TMDL is zero trash in Peck Road Lake and on the shoreline. Both point sources and nonpoint sources are identified as sources of trash. WLAs could be assigned to permittees of the Los Angeles County MS4 permit and the Department.

Final Trash WLA Specific to the Department

No WLAs were assigned to the Department.

Final Trash Deadlines

There is no compliance and implementation schedule for the Peck Road Park Lake Trash TMDL.

Department’s Trash Contribution (relative contribution to pollutant loading)

As there are no assigned WLAs, the Department’s contribution to the estimated point source trash loads is 3.9 percent or 950 gal/yr.

Los Angeles River Trash TMDL, December 24, 2008

Final Trash WLA

The numeric target for the Los Angeles River Watershed Trash TMDL is zero trash in the water. Storm drains were identified as a major source of trash in the Los Angeles River. WLAs were assigned to permittees of the Los Angeles County MS4 permit and the Department.

Final Trash WLA Specific to the Department

The Department is assigned the following baseline WLAs for trash.

WLA (gal)	WLA (lbs)
59421	66,566

Final Trash Deadlines

The implementation schedule for the MS4 and the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within seven years from the effective date of the TMDL (September 30, 2014).

Department’s Trash Contribution (relative contribution to pollutant loading)

The Department’s Baseline WLA relative to all other point sources (municipal permittees) is 11.8 percent.

Machado Lake Trash TMDL, February 27, 2008

Final Trash WLA

The numeric target for this TMDL is zero trash in Machado Lake and on the shoreline. Both point sources and nonpoint sources are identified as sources of trash in Machado Lake. WLAs were assigned to permittees of the Los Angeles County MS4 permit and the Department.

Final Trash WLA Specific to the Department

The Department is assigned the following baseline WLA assuming a trash generation rate of 5,334 (gallons of uncompressed litter per mile² per year).

Point Source Area (mile ²)	Baseline WLA (gal/yr)
0.63	4,215.84

Final Trash Deadlines

The implementation schedule for the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within eight years of the effective date of the TMDL (March 6, 2016).

Department's Trash Contribution (relative contribution to pollutant loading)

The Department's Baseline WLA relative to all other point sources (municipal permittees) is 4.5 percent.

Malibu Creek Watershed Trash TMDL, June 26, 2009

Final Trash WLAs

The numeric target for the Malibu Creek Watershed Trash TMDL is zero trash in or on the water and on the shoreline. For point sources, zero means that no trash is discharged into the water body of concern, shoreline, and channels. Both point source and nonpoint sources of trash were identified in the water bodies in the Malibu Creek Watershed. For point sources, WLAs were assigned to permittees of the Los Angeles County MS4 permit and Ventura County MS4 permit and the Department.

Final Trash WLA Specific to the Department

The Department is assigned the following WLAs assuming a trash generation rate of 640 (gallons of uncompressed litter).

Point Source Area (mile ²)	Baseline WLA (gal/yr)
0.32	10,813

Final Trash Deadlines

The implementation schedule for the MS4 and the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within eight years of the effective date of the TMDL (July 7, 2017).

Department's Trash Contribution (relative contribution to pollutant loading)

The Department's Baseline WLA relative to all other point sources (municipal permittees) is 65.5 percent.

Revolon Slough and Beardsley Wash Trash TMDL, August 1, 2002, February 8, 2005, and February 27, 2008

Final Trash WLA

The numeric target for the Revolon Slough and Beardsley Wash TMDL is zero trash within Revolon Slough, Beardsley Wash and their tributaries. Both point source and nonpoint sources of trash were identified in the Revolon Slough and Beardsley Wash. For point sources, WLAs were assigned to permittees of the Ventura County MS4 permit and the Department.

Final Trash WLA Specific to the Department

The Department is assigned the following WLA (gal/year) assuming a trash generation rate of 640 (gallons of uncompressed litter).

Point Source Area (mile²)	Baseline WLA (gal/yr)
1.68	11,215.45

Final Trash Deadlines

The implementation schedule for the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within eight years of the effective date of the TMDL (March 6, 2016).

Department's Trash Contribution (relative contribution to pollutant loading)

The Department's Baseline WLA relative to all other point sources (municipal permittees) is 64.1 percent.

Santa Monica Bay Nearshore & Offshore Debris (trash and plastic pellets), March 20, 2012

Final Trash WLA

The numeric target for the Santa Monica Bay Debris TMDL is zero trash in Santa Monica Bay. For point sources, zero trash is defined as no trash discharged into water bodies within the Santa Monica Bay Watershed and into Santa Monica Bay or on the shoreline of Santa Monica Bay. For nonpoint sources, zero trash is defined as no trash on the shoreline or beaches, or in harbors adjacent to Santa Monica Bay. The numeric target for plastic pellets in the Santa Monica Bay Debris TMDL is zero plastic pellets in Santa Monica Bay. Both point source and nonpoint sources of trash were identified in Santa Monica Bay Nearshore and Offshore areas. For point sources, WLAs were assigned to permittees of the Los Angeles County MS4 permit and Ventura County MS4 permit and the Department.

Final Trash WLA Specific to the Department

The Baseline WLA for the Department was based on a trash generation rate of 33,452.8 gallons per mile² per year.

Point Source Area (mile ²)	Baseline WLA (gal/year)
1.08	36,129.0

Final Trash Deadlines

The implementation schedule for the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within eight years of the effective date of the TMDL (March 12, 2020).

Department's Trash Contribution (relative contribution to pollutants)

The Department's Baseline WLA relative to all other point sources (municipal permittees) is 32.8 percent.

Ventura River Estuary Trash TMDL, February 27, 2008

Final Trash WLA

The numeric target for the Ventura River Estuary Trash TMDL is zero trash in or on the water and on the shoreline. Both point source and nonpoint sources of trash were identified in the Ventura River Estuary.

Final Trash WLA Specific to the Department

The Department is assigned the following WLAs assuming a trash generation rate of 640 (gallons of uncompressed litter).

Point Source Area (mile ²)	Baseline WLA (gal/yr)
0.31	2,049.86

Final Trash Deadlines

The implementation schedule for the Department consists of a phased approach with compliance to be achieved in prescribed percentages. Total compliance, 100 percent reduction of trash from the Baseline WLA, is to be achieved within eight years of the effective date of the TMDL (March 8, 2016).

Department's Trash Contribution (relative contribution to pollutants)

The Department's Baseline WLA relative to all other point sources (municipal permittees) is 34.8 percent.

E. Bacteria TMDL Pollutant Category

General Description of Pollutant Category

Receiving waters are often adversely affected by urban storm water runoff containing bacteria. Several reaches and tributaries have been impaired due to excessive amounts of coliform bacteria. There is a causal relationship between adverse health effects and recreational water quality, as measured by bacterial indicator densities. Fecal coliform bacteria may be introduced from a variety of sources including storm water runoff, dry-weather runoff, onsite wastewater and animal wastes. In addition, humans may be exposed to waterborne pathogens through recreation water use or by harvesting and consuming filter-feeding shellfish.

Attachment IV of this permit requires the Department to prioritize reaches, including those within watersheds under a bacteria TMDL, and then further to select each year the reaches for implementing control measures to address the highest priority reaches.

Sources of Pollutant & How it Enters the Waterway

Major contributors are flows and associated bacteria loading from storm water conveyance systems. The extent of bacteria loading from natural sources such as birds, waterfowl and other wildlife, however, are unknown as data does not exist to quantify the impact of wildlife on the waterbodies.

Watershed Contribution

The TMDLs in the Bacteria Pollutant Category show that the Department is a relatively minor source of pollutants.

Control Measures

This prioritization strategy will control the largest sources of bacteria first and allow for attainment of the applicable WLAs consistent with the bacteria TMDLs identified in Part E of Attachment IV. The Department must install structural and nonstructural controls utilizing BMPs to variously control dry weather discharges and wet weather discharges.

The Department has options that would be effective for controlling non-storm water runoff during dry weather. The Department is required to implement control measures to ensure that the effective prohibition of non-storm water discharges is implemented. This can be achieved through infiltration, diversion, or other methods. Generally, there should be no flow from areas during dry weather. Overwatering, broken sprinklers and irrigation pipes can be a source of dry weather flows. The Department can limit dry weather discharges by ensuring that broken sprinklers and irrigation pipes are fixed within 72 hours. To control overwatering and the resulting runoff, the Department could review watering schedules for irrigated areas on an annual basis.

To control runoff during wet weather, the Department should work with responsible agencies to jointly comply with the TMDL whenever possible. If the Department does not work with the other responsible agencies, non-structural and structural BMPs would be necessary.

Increasing infiltration through the slowing of runoff and improving soil structure and texture to encourage infiltration of storm water are non-structural ways to reduce runoff. In addition, structural BMPs like biofiltration strips, biofiltration swales and detention basins can work in concert with the non-structural BMPs to capture of the runoff.

Wet-weather flows for the most part impact water contact recreation beneficial uses (REC-1). The Department shall implement control measures to prevent or eliminate the discharge of bacteria from its ROW through a combination of source control and treatment BMPs. These treatment BMPs shall include retention/detention, infiltration, diversion of storm water or through preemptive activities such as sweeping, clean-up of illegal dumping, and public education on littering.

SAN FRANCISCO BAY BACTERIA TMDLS

Richardson Bay Pathogens TMDL, December 18, 2009

The TMDL identifies storm water runoff as a potential pathogen source, along with sanitary sewer systems and houseboats and vessel marinas. The Department is listed in the storm water runoff source category along with other implementing parties.

Final Pathogens WLA

The WLA for Fecal Coliform in the pollutant category of storm water runoff is a median of < 14 MPN/100 ml and a 90th percentile limit of <43 MPN/100 ml (no more than 10 percent of total samples during any 30-day period may exceed this number)

The implementation plan for storm water runoff has the following actions:

1. Implement applicable storm water management plan.
2. Update/amend storm water management plan, as appropriate, to include specific measures to reduce pathogen loading, including additional education and outreach efforts, and installation of additional pet waste receptacles.
3. Report progress on implementation of pathogen reduction measures to the Water Board.

For most pollutants, TMDLs are expressed on a mass-load basis (e.g., kilograms per year). For pathogen indicators such as fecal coliform, however, it is the number of organisms in a given volume of water (i.e., their density), and not their total number (or mass) that is significant with respect to public health risk and protection of beneficial uses. The density of fecal coliform organisms in a discharge and/or in the receiving waters is the technically relevant criteria for assessing the impact of discharges, water quality, and public-health risk. U.S. EPA guidance recommends establishing density-based TMDLs for pollutants that are not readily controllable on a mass basis. Therefore, we propose density-based TMDLs and pollutant load allocations, expressed in terms of fecal coliform concentrations.

Establishment of a density-based, rather than a mass-based, TMDL carries the advantage of eliminating the need to conduct a complex and potentially error-prone analysis to link loads and projected densities. A load-based pathogens TMDL would require calculation of acceptable loads based on acceptable bacterial densities and anticipated discharge volumes, and then back-calculation of expected densities under various load reduction scenarios. Since discharge volumes in Richardson Bay are highly variable and difficult to measure, such an analysis would inevitably involve a great deal of uncertainty with no increased water quality benefit.

Pathogen WLA Specific to the Department

As stated in the TMDL, the Department's wasteload allocations for discharges from municipal separate storm sewers are set by NPDES permits No. CAS000004 [Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)] and CAS000003 (National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit Waste Discharge Requirements (WDRs) for State Of California Department Of Transportation).

Final Pathogens Deadline

The completion date for these implementation actions is "as specified in approved storm water management plan and in applicable NPDES permit." Region 2 does not anticipate that the Department's storm water management plan will need to be revised because they believe that the source of bacteria in highway runoff is wildlife.

The TMDL also notes that in 2013, the Water Board will evaluate monitoring results and assess progress towards attaining TMDL targets and load allocations.

Department's Pathogens Contribution (relative contribution to pollutant loading)

The Department's relative contribution to pathogen pollutant loading is not known.

San Pedro and Pacifica State Beach Bacteria TMDL, August 1, 2013

The San Pedro and Pacifica State Beach Bacteria TMDL was developed by the San Francisco Bay Regional Water Quality Control Board and approved by U.S. EPA on August 1, 2013. The TMDL identifies sanitary sewer systems, horse facilities and municipal storm water runoff and dry weather flows as sources that have the potential to discharge bacteria, if not properly managed, to San Pedro Creek and Pacifica State Beach.

Final Bacteria WLA

The TMDL established a desired, or target condition for the water contact recreation use in San Pedro Creek and at Pacifica State Beach based on the water quality objectives for indicator bacteria. The wasteload allocations are based on the water quality objectives shown in the table below:

Bacteriological Water Quality Objectives for San Pedro Creek and Pacifica State Beach		
Indicator Type	Pacifica State Beach (Marine REC-1) MPN/100 mL	San Pedro Creek (Freshwater REC-1) MPN/100 mL¹
	Single Sample Maximum	90th Percentile/No Sample Greater Than
E. coli	NA	235
Fecal Coliform	400	400
Enterococcus	104	NA
Total Coliform	10,000 ²	10,000
	Geometric Mean³	Geometric Mean/Log Mean/Median
E. coli	NA	
Fecal Coliform	200	126
Enterococcus	35	200
Total Coliform	1,000	NA 240
Notes:		
1. Based on a minimum of five consecutive samples equally spaced over a 30-day period.		
2. Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1.		
3. Calculated based on the five most recent samples from each site during a 30-day period.		
NA: not applicable.		

For this TMDL, a reference system and antidegradation approach has been incorporated the wasteload allocations as an allowable number of times that the water quality objectives can be exceeded. The following table lists the allowable exceedances:

Numeric Targets, TMDLs and Allocations Based on Allowable Exceedances of Single-Sample Objective for San Pedro Creek and Pacifica State Beach					
	San Pedro Creek		Pacifica State Beach		
	Dry Weather	Wet Weather⁵	Summer Dry Weather (Apr. 1 - Oct. 31)	Winter Dry Weather (Nov. 1 - Mar. 31)	Wet Weather⁵
Allowable Exceedances of Single- Sample Objectives (assuming daily sampling is conducted) ^{1,2,3}	4	26	0	2	30
Allowable Exceedances of Single- Sample	1	4	0	1	5

Numeric Targets, TMDLs and Allocations Based on Allowable Exceedances of Single-Sample Objective for San Pedro Creek and Pacifica State Beach					
	San Pedro Creek		Pacifica State Beach		
	Dry Weather	Wet Weather⁵	Summer Dry Weather (Apr. 1 - Oct. 31)	Winter Dry Weather (Nov. 1 - Mar. 31)	Wet Weather⁵
Objectives (assuming weekly sampling is conducted)⁴					
Notes: 1. Allowable exceedances are calculated by multiplying exceedance rates observed in the reference system(s) by the number of days during each respective period in the reference year (1994). 2. To end up with whole numbers, where the fractional remainder for the calculated allowable exceedance days exceeds 0.1, then the number of days is rounded up. 3. The calculated number of exceedance days assumes that daily sampling is conducted. 4. To determine the allowable number of exceedance events given a weekly sampling regime, as practiced for monitoring San Pedro Creek and Pacifica State Beach, the number of exceedance days was adjusted by solving for "X" in the following equation: $X = (\text{exceedance days} \times 52 \text{ weeks}) / 365 \text{ days}$. 5. Wet weather is defined as any day with 0.1 inches of rain or more and the following three days.					

Final Bacteria Deadlines

The TMDLs, load allocations and wasteload allocations for Pacifica State Beach shall be attained within eight years of the effective date of the TMDL (August 1, 2021). The TMDLs, load allocations and wasteload allocations to San Pedro Creek shall be attained within 15 years of the effective Date of the TMDL (August 1, 2028).

Storm water discharges from the Department's stretch of Highway 1 crossing the northwestern edge of the San Pedro Creek watershed are not a significant source of indicator bacteria because that section of the highway does not include any typical bacteria-generating sources such as homeless encampments, restroom facilities, garbage bins, etc. The Department's existing BMPs and storm water NPDES permit requirements, as of the effective date of the TMDL (August 1, 2013), are sufficient to attain and maintain its portion of the wasteload allocation.

Department's Bacteria Contribution (relative contribution to pollutant loading)

The Department's relative contribution to bacteria pollutant loading is not known.

LOS ANGELES REGION BACTERIA TMDLS

Ballona Creek, Ballona Estuary, and Sepulveda Channel Bacteria TMDL, March 26, 2007

Final Bacteria WLA

The Department is noted as a source of storm water runoff. The Department and municipal storm water permittees and co-permittees are assigned waste load allocations (WLAs) expressed as the number of daily or weekly sample days that may exceed the single sample targets equal to the TMDLs established for the impaired reaches and WLA assigned to waters tributary to impaired reaches. The County of Los Angeles, the Department, and the Cities of Los Angeles, Culver City, Beverly Hills, Inglewood, West Hollywood, and Santa Monica are the responsible jurisdictions and responsible agencies for the Ballona Creek Watershed.

For the single sample objectives of the impaired REC-1 and LREC-1 reaches, the proposed WLA for summer dry-weather is zero (0) days of allowable exceedances, and those for winter dry-weather and wet-weather are three (3) days and seventeen (17) days of exceedance, respectively. In the instances where more than one single sample objective applies, exceedance of any one of the limits constitutes an exceedance day. The proposed waste load allocation for the rolling 30-day geometric mean for the responsible agencies and jurisdictions is zero (0) days of allowable exceedances.

For the single sample objectives of the impaired REC-2 reach, the proposed WLA for all periods is a 10 percent exceedance frequency of the REC-2 single sample water quality objectives. The proposed waste load allocation for the rolling 30-day geometric mean for the responsible agencies and jurisdictions is zero (0) days of allowable exceedances.

In addition to assigning TMDLs for the impaired reaches, Waste Load Allocations and Load Allocations are assigned to the tributaries to these impaired reaches. These WLAs and LAs are to be met at the confluence of each tributary and its downstream reach (see Table 7.21.2b of Attachment A to Resolution No. 2006-011). See Chapter 3 of Region 4's Basin Plan for bacteriological objectives for Water Contact Recreation for Marine and Fresh Waters, for Limited Water Contact Recreation and for Non-contact Water Recreation.

Final Bacteria WLA Specific to the Department

There is no specific WLA assigned to the Department. The responsible jurisdictions and responsible agencies within the watershed are jointly responsible for complying with the waste load allocation in each reach.

Final Bacteria Deadlines

See Final WLA above.

Department's Bacteria Contribution (relative contribution to pollutant loading)

The Department's jurisdiction within the cities and unincorporated areas in the Ballona Creek Watershed totals 1206 acres. This equals 1.5 percent of the watershed.

Long Beach City Beaches Indicator Bacteria TMDL, March 26, 2012

The TMDL identifies storm water runoff from the Department's properties such as the highway system, park and ride facilities, and maintenance yards as a potential source of bacteria. The Department has jurisdiction of some areas in the Los Angeles River (LAR) Estuary direct drainage, but not in the Long Beach City beaches direct drainage.

Final Bacteria WLA

To implement the single sample bacteria water quality objectives (total coliform, fecal coliform, enterococcus, and fecal-to-total coliform ratio) for waters designated REC-1, an allowable number of exceedance days for three seasons (summer dry, winter dry and winter wet) is set for marine waters using a reference system/anti-degradation approach. This approach ensures that bacteriological water quality is at least as good as that of a reference system and that no degradation of the existing bacteriological water quality is permitted where the existing condition is better than that of the selected reference system(s). The exceedance days are used to set load allocations (LA) and waste load allocations (WLAs) in these TMDLs.

Storm water systems covered under the City of Long Beach, Los Angeles County and the Department's MS4 permits are assigned WLAs in the form of exceedance days. During summer dry conditions, reductions in exceedance days are estimated to be 13-120 days during a 120 day period (11 percent to 100 percent of the time), depending on the location of the monitoring site. During winter wet conditions, reductions in exceedance days are estimated to be 11-45 days during a 75-day period (15 percent to 60 percent of the time) depending on the location of the monitoring site. During winter dry conditions, reductions in exceedance days are estimated to be 0-11 days during an 80 day period (zero (0) percent to 14 percent of the time) depending on the location of the monitoring site.

Final Bacteria WLA Specific to the Department

See Final WLA above.

Final Bacteria Deadlines

As this TMDL was established by U.S. EPA, U.S. EPA only described recommendations to the Regional Board that could be used. No timelines were noted.

Department's Bacteria Contribution (relative contribution to pollutant loading)

The loading of bacteria specifically from the Department's properties has not been determined in the LAR Estuary direct drainage. However a conservative estimate of 128 acres or approximately two percent of the LAR Estuary drainage area is noted in the TMDL.

Los Angeles River Watershed Bacteria, March 23, 2012

Final Bacteria WLA

The Los Angeles River Watershed Bacteria TMDL was developed by the Los Angeles Regional Water Quality Control Board and approved by U.S. EPA. The TMDL identifies storm water from the MS4 Permittees (the Department along with the County of Los Angeles and the Incorporated Cities therein and the City of Long Beach) as the principal source of bacteria in both dry weather and wet weather.

Final Bacteria WLA Specific to the Department

This TMDL uses a “reference system/anti-degradation approach” to implement the water quality objectives per the implementation provisions in Chapter 3 of the Basin Plan. On the basis of the historical exceedance frequency at Southern California reference reaches, a certain number of daily exceedances of the single sample bacteria objectives are permitted. The allowable number of exceedance days is set such that (1) bacteriological water quality at any site is at least as good as at the reference site(s) and (2) there is no degradation of existing bacteriological water quality. This approach recognizes that there are natural sources of bacteria that may cause or contribute to exceedances of the single sample objectives and that it is not the intent of the Regional Board to require treatment or diversion of natural coastal creeks or to require treatment of natural sources of bacteria from undeveloped areas.

For MS4 dischargers, the final dry-weather WLAs and wet-weather WLA for the single sample targets are listed below:

Allowable Number of Exceedance Days	Daily Sampling	Weekly Sampling
Dry Weather	5	1
Non-High Flow Suspension (HFS) Waterbodies Wet Weather	15	2
HFS Waterbodies Wet Weather	10 (not including HFS days)	2 (not including HFS days)

The final WLAs for the geometric mean target during any time at any river segment and tributary in the Los Angeles River Watershed is zero (0) days of allowable exceedances.

Final Bacteria Deadlines

The Department has from 8.5 to 25 years (September 23, 2020 to March 23, 2037) to achieve final WLAs depending on the segment of the waterbody. Table 7-39.3 in Attachment A to Resolution No. R10-007 lists other interim implementation compliance dates.

Department's Bacteria Contribution (relative contribution to pollutant loading)

The Department's MS4 permit covers approximately 6,950 acres, which is equivalent to around one percent of the urban watershed.

Malibu Creek and Lagoon Bacteria TMDL, June 7, 2012

The TMDL identifies on-site wastewater treatment plants, storm water runoff, dry weather runoff and wildlife (birds) as possible sources of bacterial contamination.

Final WLA

Malibu Creek and Lagoon Bacteria TMDL: Final Annual Allowable Exceedance Days for Single Sample Limits by Sampling Location

Compliance Deadline		January 24, 2012		July 15, 2021	
Station ID	Location Name	Dry Weather ^		Wet Weather ^	
		Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling
LA RWQCB	Triunfo Creek	5	1	15	2
LA RWQCB	Lower Las Virgenes Creek	5	1	15	2
LA RWQCB	Lower Medea Creek	5	1	15	2
LVMWD (R-9)	Upper Malibu Creek, above Las Virgenes Creek	5	1	15	2
LVMWD (R-2)	Middle Malibu Creek, below Tapia discharge 001	5	1	15	2
LVMWD (R-3)	Lower Malibu Creek, 3 mi below Tapia	5	1	15	2
LVMWD (R-4)	Malibu Lagoon, above PCH	5	1	15	2
LVMWD (R-11)	Malibu Lagoon, below PCH	9*	2*	17	3
	Other sampling stations as identified in the Compliance Monitoring Plan as approved by the Executive Officer including at least one sampling station in each subwatershed, and areas where frequent REC-1 use is known to occur.	5	1	15	2

Compliance Deadline		January 24, 2012		July 15, 2021	
Station ID	Location Name	Dry Weather ^		Wet Weather ^	
		Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
Notes: The number of allowable exceedances is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical monitoring data. The allowable number of exceedance days is calculated based on the 90th percentile storm year in terms of wet days at the LAX meteorological station. ^ A dry day is defined as a non-wet day. A wet day is defined as a day with a 0.1 inch or more of rain and the three days following the rain event. * The number of allowable exceedance days is for the winter dry-weather period. No exceedance days are allowed for the summer dry-weather period.					

Final Bacteria WLA Specific to the Department

No exceedances are allowed for the geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet weather, and by sampling locations as described in the Table above (Malibu Creek and Lagoon Bacteria TMDL: Final Annual Allowable Exceedance Days for Single Sample Limits by Sampling Location)

Final Bacteria Deadlines

This TMDL will be implemented in two phases as outlined in the TMDL. By January 24, 2012, compliance with the allowable number of dry-weather exceedance days must be achieved. By July 15, 2021, compliance with the allowable number of wet-weather exceedance days and the geometric mean targets must be achieved.

Department's Bacteria Contribution (relative contribution to pollutant loading)

The Department's relative contribution to bacteria pollutant loading is not known.

Marina del Rey Harbor (MdRH) Mother's Beach and Back Basin Bacteria TMDL, March 18, 2004, revised November 7, 2013

The TMDL identifies dry-weather urban runoff and storm water conveyed by storm drains as the primary sources of elevated bacterial indicator densities to MdRH Mothers' Beach and back basins during dry and wet weather. Potential sources of bacterial contaminations at Mothers' Beach and the back basins of MdRH include marina activities such as waste disposal from boats, boat deck and slip washing, swimmer "wash-off," restaurant washouts and natural sources from birds, waterfowl and other wildlife.

Final Bacteria WLA

Implementation of the bacteria objectives and the associated TMDL numeric targets is achieved using a "reference system/anti-degradation approach" as set forth in Chapter 3 of

the Basin Plan. As required by the Clean Water Act and California Water Code, Basin Plans include beneficial uses of waters, water quality objectives to protect those uses, an anti-degradation policy, collectively referred to as water quality standards, and other plans and policies necessary to implement water quality standards. This TMDL and its associated waste load allocations, which shall be incorporated into relevant permits, and load allocations are the vehicles for implementation of the Region’s standards.

The geometric mean targets may not be exceeded at any time. For purposes of this TMDL, the geometric means shall be calculated weekly as a rolling geometric mean using five or more samples, for six week periods starting all calculation weeks on Sunday. For the single sample targets, each existing monitoring site is assigned an allowable number of exceedance days for three time periods: (1) summer dry-weather (April 1 to October 31), (2) winter dry-weather (November 1 to March 31), and (3) wet-weather (defined as days with 0.1 inch of rain or greater and the three days following the rain event).

The County of Los Angeles, Los Angeles County Flood Control District, City of Los Angeles, and Culver City are the Los Angeles County MS4 permittees identified as the responsible jurisdictions and responsible agencies for the Marina del Rey Watershed. All proposed WLAs for summer dry weather are zero (0) days of allowable exceedances.²⁴ The proposed WLAs for winter dry weather and wet weather vary by monitoring location as identified in the following table:

Marina del Rey Harbor Mothers’ Beach and Back Basins Bacteria TMDL: Final Allowable Exceedance Days by Sampling Location

Compliance Deadline		March 18, 2007		March 18, 2007		July 15, 2021	
		Summer Dry Weather ^		Winter Dry Weather ^		Wet Weather ^	
		Apr 1 – Oct 31		Nov 1 – Mar 31		Nov 1 – Oct 31	
Station ID	Location Name	Daily sampling (No. days)	Weekly sampling (No. Days)	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
MdRH-1	Mothers’ (Marina) Beach, at playground area	0	0	9	2	17	3

²⁴ In order to fully protect public health, no exceedances are permitted at any monitoring location during summer dry-weather (April 1 to October 31). In addition to being consistent with the two criteria, waste load allocations of zero (0) days of allowable exceedances are further supported by the fact that the California Department of Public Health has established minimum protective bacteriological standards – the same as the numeric targets in this TMDL – which, when exceeded during the period April 1 to October 31, result in posting a beach with a health hazard warning (California Code of Regulations, Title 17, Section 7958).

Compliance Deadline		March 18, 2007		March 18, 2007		July 15, 2021	
		Summer Dry Weather ^		Winter Dry Weather ^		Wet Weather ^	
		Apr 1 – Oct 31		Nov 1 – Mar 31		Nov 1 – Oct 31	
MdRH-2	Mothers' (Marina) Beach, at lifeguard tower	0	0	9	2	17	3
MdRH-3	Mothers' (Marina) Beach, between lifeguard tower and boat dock	0	0	9	2	17	3
MdRH-4	Basin D, near first slips outside swim area	0	0	9	2	17	3
MdRH-5	Basin E, in front of tide-gate from Oxford Basin	0	0	9	2	17	3
MdRH-6	Basin E, center of basin	0	0	9	2	17	3
MdRH-7	Basin E, in front of Boone-Olive Pump Outlet	0	0	9	2	17	3
MdRH-8	Back of Main Channel	0	0	9	2	17	3
MdRH-9	Basin F, center of basin	0	0	9	2	8	1

Compliance Deadline	March 18, 2007	March 18, 2007	July 15, 2021
	Summer Dry Weather ^	Winter Dry Weather ^	Wet Weather ^
	Apr 1 – Oct 31	Nov 1 – Mar 31	Nov 1 – Oct 31

Notes:

The number of allowable exceedances is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical monitoring data.

The allowable number of exceedance days during winter dry-weather is calculated based on the 10th percentile storm year in terms of dry days at the LAX meteorological station.

The allowable number of exceedance days during wet-weather is calculated based on the 90th percentile storm year in terms of wet days at the LAX meteorological station.

^ A dry day is defined as a non-wet day.

A wet day is defined as a day with a 0.1 inch or more of rain and the three days following the rain event.

Final Bacteria WLA Specific to the Department

See Final WLA above.

Final Bacteria Deadlines

This TMDL will be implemented over an 18-year period. By March 18, 2007, there shall be no allowable exceedances of the single sample limits at any location during summer dry weather (April 1 to October 31) or winter dry weather (November 1 to March 31). By July 15, 2021, compliance with the allowable number of wet weather exceedance days and the geometric mean targets must be achieved.

Department’s Bacteria Contribution (relative contribution to pollutant loading)

The Department’s jurisdiction covers one percent of the watershed.

Santa Clara River Estuary and Reaches 3, 5, 6, and 7 Indicator Bacteria TMDL, January 13, 2012

The TMDL identifies dry- and wet-weather urban runoff discharges from the storm water conveyance systems as significant contributors of bacteria loading to the Santa Clara River and Estuary. Mass emission data collected by MS4 Permittees show elevated levels of bacteria in the river. Data from natural landscapes in the region indicate that open space loading is not a significant source of bacteria.

Final Bacteria WLA

The Statewide Storm Water Permit for Department Activities (CAS000003) are assigned WLAs of zero (0) allowable exceedance days of the single sample targets for both dry and wet weather and no exceedances of the geometric mean targets because they are not expected to be significant source of indicator bacteria. Compliance with an effluent limit based on the bacteria water quality objectives will be used to demonstrate compliance with the WLA.

Final Bacteria WLA Specific to the Department

See Final WLA above.

Final Deadlines

The TMDL states that WLAs assigned to the Department's permit must be attained on the effective date of the TMDL.

Department's Contribution (relative contribution to pollutant loading)

The Department's relative contribution to pollutant loading is unknown.

Santa Monica Bay Beaches Bacteria TMDL June 19, 2003, Revised November 7, 2013

Final WLA

With the exception of isolated sewage spills, dry weather urban runoff and storm water runoff conveyed by storm drains and creeks is the primary source of elevated bacterial indicator densities to Santa Monica Beaches (SMB). Limited natural runoff and groundwater may also potentially contribute to elevated bacterial indicator densities during winter dry weather. Because the bacterial indicators used as targets in the TMDL are not specific to human sewage, storm water runoff from undeveloped areas may also be a source of elevated bacterial indicator densities. For example, storm water runoff from natural areas may convey fecal matter from wildlife and birds or bacteria from soil. This is supported by the finding that, at the reference beach, the probability of exceedance of the single sample targets during wet weather is 0.22.

Implementation of the bacteria objectives in Chapter 3 of the Basin Plan and the associated TMDL numeric targets is achieved using a "reference system/anti-degradation approach" rather than the alternative "natural sources exclusion approach" or strict application of the single sample objectives. As required by the Clean Water Act and Porter-Cologne Water Quality Control Act, Basin Plans include beneficial uses of waters, water quality objectives to protect those uses, an anti-degradation policy, collectively referred to as water quality standards, and other plans and policies necessary to implement water quality standards. This TMDL and its associated waste load allocations, which shall be incorporated into relevant permits, and load allocations are the vehicles for implementation of the Region's standards.

The geometric mean targets may not be exceeded at any time. For the single sample targets, each existing shoreline monitoring site is assigned an allowable number of exceedance days during three time periods as defined in the table below (summer dry weather, winter dry weather, and wet weather [defined as days with 0.1 inch of rain or greater and the three days following the rain event]). The allowable exceedance days for each associated shoreline monitoring site are identified in the following table:

Allowable Number of Days that may Exceed any Single Sample Bacterial Indicator Target for Existing Shoreline Monitoring Stations

Compliance Deadline			15-Jul-06		1-Nov-09		15-Jul-21	
Station ID	Location Name	Subwatershed	Summer Dry Weather ^A		Winter Dry Weather ^A		Wet Weather Year-round	
			Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
SMB 1-1	Leo Carillo Beach (REFERENCE)	Arroyo Sequit	0	0	9	2	17	3
SMB 1-2	El Pescador State Beach	Los Alisos	0	0	1	1	5	1
SMB 1-3	El Matador State Beach	Encinal Canyon	0	0	1	1	3	1
SMB 1-4	Trancas Creek	Trancas Canyon	0	0	9	2	17	3
SMB 1-5	Zuma Creek	Zuma Canyon	0	0	9	2	17	3
SMB 1-6	Walnut Creek	Ramirez Canyon	0	0	9	2	17	3
SMB O-1#	Paradise Cove	Ramirez Canyon	0	0	9	2	15	3
SMB 1-7	Ramirez Creek	Ramirez Canyon	0	0	9	2	17	3
SMB 1-8	Escondido Creek	Escondido Canyon	0	0	9	2	17	3
SMB 1-9	Latigo Canyon Creek	Latigo Canyon	0	0	9	2	17	3
SMB 1-10	Solstice Creek	Solstice Canyon	0	0	5	1	17	3
SMB O-2#	Puerco Canyon storm drain	Corral Canyon	0	0	0	0	6	1
SMB 1-11	Wave wash of unnamed creek on Puerco Beach	Corral Canyon	0	0	9	2	17	3
SMB 1-12	Marie Canyon Storm Drain on	Corral Canyon	0	0	9	2	17	3
SMB 1-13	Sweetwater Creek on Carbon	Carbon Canyon	0	0	9	2	17	3
SMB 1-14	Las Flores Creek	Las Flores	0	0	6	1	17	3
SMB 1-15	Big Rock Beach at 19948 Pacific	Piedra Gorda	0	0	9	2	17	3
SMB 1-16	Pena Creek	Pena Canyon	0	0	3	1	14	2
SMB 1-17	Tuna Canyon Creek	Tuna Canyon	0	0	7	1	12	2
SMB 1-18	Topanga Creek	Topanga Canyon	0	0	9	2	17	3
SMB 4-1	San Nicholas Canyon Creek	Nicholas Canyon	0	0	4	1	14	2
SMB 2-1	Castlerock (Parker Mesa) Storm	Castlerock	0	0	9	2	17	3
SMB 2-2	Santa Ynez Storm Drain	Santa Ynez	0	0	9	2	17	3
SMB 2-3	Will Rogers State Beach at 17200	Santa Ynez	0	0	9	2	17	3
SMB 2-4	Pulga Canyon storm drain	Pulga Canyon	0	0	9	2	17	3
SMB 2-5	Temescal Storm Drain	Pulga Canyon	0	0	9	2	17	3
SMB 2-6	Bay Club Storm Drain	Santa Ynez	0	0	9	2	17	3
SMB 2-7	Santa Monica Canyon, Will	Santa Monica	0	0	9	2	17	3
SMB 2-8	Venice Pier, Venice	Ballona	0	0	9	2	17	3
SMB 2-9	Topsail Street extended	Ballona	0	0	9	2	17	3
SMB 2-10	Dockweiler State Beach at Culver	Dockweiler	0	0	9	2	17	3
SMB 2-11	North Westchester Storm Drain	Dockweiler	0	0	0	0	17	3
SMB 2-12	World Way extended	Dockweiler	0	0	9	2	17	3
SMB 2-13	Imperial Highway storm drain	Dockweiler	0	0	4	1	17	3
SMB 2-14	Opposite Hyperion Plant, 1 mile	Dockweiler	0	0	9	2	17	3
SMB 2-15	Grand Avenue Storm Drain	Dockweiler	0	0	9	2	17	3

Compliance Deadline			15-Jul-06		1-Nov-09		15-Jul-21	
Station ID	Location Name	Subwatershed	Summer Dry Weather [^]		Winter Dry Weather [^]		Wet Weather Year-round	
			Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
SMB 3-1	Montana Ave. Storm Drain	Santa Monica	0	0	9	2	17	3
SMB 3-2	Wilshire Blvd., Santa Monica	Santa Monica	0	0	9	2	17	3
SMB 3-3	Santa Monica Municipal Pier at	Santa Monica	0	0	9	2	17	3
SMB 3-4	Santa Monica Beach at	Santa Monica	0	0	9	2	17	3
SMB 3-5	Ashland Av. storm drain (Venice)	Santa Monica	0	0	9	2	17	3
SMB 3-6	Rose Ave. Storm Drain on	Santa Monica	0	0	6	1	17	3
SMB 3-7	Venice City Beach at Brooks	Ballona	0	0	9	2	17	3
SMB 3-8	Venice Pavilion at projection of	Ballona	0	0	9	2	17	3
SMB 3-9	Strand Street extended	Santa Monica	0	0	9	2	17	3
SMB 5-1	Manhattan State Beach at 40th	Hermosa	0	0	1	1	4	1
SMB 5-2	Terminus of 28th Street Drain in	Hermosa	0	0	9	2	17	3
SMB 5-3	Manhattan Beach Pier	Hermosa	0	0	3	1	6	1
SMB 5-4	Near 26th Street on Hermosa	Hermosa	0	0	3	1	12	2
SMB 5-5	Hermosa Beach Pier	Hermosa	0	0	2	1	8	2
SMB 6-1	Herondo Storm Drain	Redondo	0	0	9	2	17	3
SMB 6-2	Redondo Municipal Pier - 100	Redondo	0	0	3	1	14	2
SMB 6-3	4' x 4' outlet at projection of	Redondo	0	0	5	1	17	3
SMB 6-4	120' north of Topaz groin	Redondo	0	0	9	2	17	3
SMB 6-5	Storm Drain at Projection of	Redondo	0	0	4	1	11	2
SMB 6-6	Malaga Cove, Palos Verdes	Redondo	0	0	1	1	3	1
SMB 7-1	Malaga Cove	Palos Verdes	0	0	1	1	14	2
SMB 7-2	Bluff Cove	Palos Verdes	0	0	1	1	0	0
SMB 7-3	Long Point	Palos Verdes	0	0	1	1	5	1
SMB 7-4	Abalone Cove	Palos Verdes	0	0	0	0	1	1
SMB 7-5	Portuguese Bend Cove	Palos Verdes	0	0	1	1	2	1
SMB 7-6	Royal Palms	Palos Verdes	0	0	1	1	6	1
SMB 7-8	Wilder Annex	Palos Verdes	0	0	1	1	2	1
SMB 7-9	Outer Cabrillo Beach	Palos Verdes	0	0	1	1	3	1
SMB MC-1	Malibu Point, Malibu Colony Dr.	Malibu Canyon	0	0	9	2	17	3
SMB MC-2	Surfrider Beach (breach point of	Malibu Canyon	0	0	9	2	17	3
SMB MC-3	Malibu Pier on Carbon Beach	Malibu Canyon	0	0	9	2	17	3

Notes: The allowable number of exceedance days during winter dry weather is calculated based on the 10th percentile year in terms of non-wet days at the LAX meteorological station.

The number of allowable exceedances during winter dry weather is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical shoreline data.

[^]Dry weather days are defined as those with <0.1 inch of rain and those days not less than 3 days after a rain day. Rain days are defined as those with >=0.1 inch of rain.

Detailed descriptions of the sampling locations are provided in the Santa Monica Bay Beaches Bacterial TMDLs Coordinated Shoreline Monitoring Plan.

#Monitoring began in 2010 and data was examined from April 2010 to November 2011

Final Bacteria WLA Specific to the Department

See Final WLA above.

Final Bacteria Deadlines

The final implementation targets in terms of allowable wet-weather exceedance days must be achieved at each individual beach location no later than July 15, 2021.

Department’s Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to bacteria pollutant loading is not known.

COLORADO RIVER REGION BACTERIA TMDL

Coachella Valley Storm Water Channel (CVSC) Bacterial Indicators TMDL, April 27, 2012

The TMDL identifies flows from urban MS4s as violating applicable water quality objectives for REC I and REC II. Birds and other animals are possible sources of bacteria in the CVSC.

Final Bacterial Indicator WLA

Wasteload allocations (WLAs) for bacteria indicator dischargers into CVSC are described below:

Allocation Type	Discharger	E. Coli Allocations
Point Source (WLAs)	Department	A log mean (Geomean) of the MPN of ≤126/100ml (based on a minimum of not less than five samples during a 30-day period), or 400 MPN/100ml for a single sample.

Final Bacterial Indicator WLA Specific to the Department

See Final WLA above.

Final Bacterial Indicator Deadlines

The final implementation targets in terms of allowable wet-weather exceedance days must be achieved at each individual beach location no later than July 15, 2021.

Department’s Bacterial Indicator Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to bacteria pollutant loading is not known.

SAN DIEGO REGION BACTERIA TMDL

Project I – Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek) TMDL, June 22, 2011

The TMDL identifies dry and wet weather runoff as the source of bacterial loading.

Final Indicator Bacteria WLA

In general, controllable point and nonpoint sources generating less than five percent of the total loads (e.g., The Department and/or Agriculture) were assigned WLAs and LAs equal to their existing loads, resulting in no load reduction requirements.

The dry weather mass-load based TMDLs were assigned entirely to discharges from MS4 land uses because the runoff that transports bacteria to surface waters during dry weather is expected to occur in urban areas. The allocation of the dry weather mass-based TMDL assumes that no surface runoff discharge to receiving waters occurs from the Department, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., $WLA_{MS4} = TMDL$).

For the wet weather TMDLs, discharges of surface runoff are expected from all land use types, thus allocations were assigned to each land use category (i.e., Municipal MS4s, the Department, Agriculture, and Open Space). The Department's wet weather WLAs were set equal to existing loads, since the Department's discharges were found to account for less than 1 percent of the wet weather load. Allocations were assigned based on discharges of "existing" bacteria loads predicted with a wet weather watershed model. In general, the Department WLAs, Agriculture LAs (in all but four of the modeled watersheds), and Open Space LAs were set equal to the "existing" bacteria loads predicted by the wet weather watershed model. The remainder of allowable bacteria load that can be discharged to the receiving waters as part of the TMDL was assigned as the Municipal MS4s WLAs (or proportionally divided between the Municipal MS4s and Agriculture land use categories in four of the modeled watersheds).

Final Indicator Bacteria WLA Specific to Department

See Final WLA above.

Final Indicator Bacteria Deadlines

TMDL Compliance Schedule: Full implementation of the TMDLs for indicator bacteria shall be completed within 10 to 20 years (April 4, 2021 to April 4, 2031) from the effective date of the Basin Plan amendment. The compliance schedule for implementing the load and wasteload reductions required to achieve the wet weather and dry weather TMDLs is phased in over time.

The dry weather TMDLs must be achieved in the receiving waters as soon as possible, but no later than 10 years (April 4, 2021) from the effective date of the Basin Plan amendment

that establishes the TMDLs. For dischargers that undertake wet weather load reduction programs only for bacteria, the wet weather TMDLs must be achieved in the receiving waters as soon as possible, but no later than 10 years (April 4, 2021) from the effective date.

For dischargers in watersheds that undertake concurrent wet weather load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs, an alternative compliance schedule may be proposed and incorporated by the San Diego Water Board into the implementing orders. The wet weather TMDL compliance schedules may be extended, but no more than a total of 20 years (April 4, 2031) from the effective date of the Basin Plan amendment. The dry weather TMDL compliance schedule cannot be extended to be more than 10 years (April 4, 2021) from the effective date of the Basin Plan amendment.

Department's Indicator Bacteria Contribution (relative contribution to pollutant loading)

The Department's relative contribution to bacteria pollutant loading is unknown.

F. Diazinon TMDL Pollutant Category

General Description of Pollutant Category

Diazinon is an organophosphate insecticide has been banned for residential use; it is still used in agriculture.

Sources of Pollutant & How it Enters the Waterway

It is a broad spectrum contact insecticide. Residential use was for general-purpose gardening use and indoor pest control of ants, fleas, cockroaches, silverfish, mosquitos and spiders in residential, non-food buildings.

Watershed Contribution

The Department does not use Diazinon. The Department is identified as a source of Diazinon because they own and operate storm water conveyance systems in association with roadways and facilities. In some areas the Department's storm water systems are connected to municipal storm water systems.

Control Measures

Attachment IV, Section III.F, prohibits the discharge of Diazinon. This prohibition is consistent with the TMDLs for Diazinon which generally limit the discharge of this pesticide to non-toxic levels. Since the Department does not use Diazinon it is in compliance with the prohibition of discharge. Attachment IV, Part F does not require additional monitoring beyond what is specified in the permit.

SAN FRANCISCO BAY REGION DIAZINON TMDL

San Francisco Bay Urban Creeks Diazinon and Pesticide Toxicity May 16, 2007

The TMDL states that most urban runoff flows through storm drains operated by all storm water entities including the Department. The use of diazinon is prohibited in the Department's NPDES permit, and no additional measures are required.

Final Diazinon WLA

The WLA for each storm water entity is 100 ng/L as a one-hour average.

Final Diazinon WLA Specific to the Department

The Department's level of responsibility is not identified.

Final Diazinon Deadlines

The TMDL does not specify any interim or final compliance dates but states that the requirements included in the permits are inadequate to meet the targets the San Francisco Bay Water Board will require additional control measures or additional actions by others.

Department's Diazinon Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the diazinon pollutant loading is not known.

SAN DIEGO REGION DIAZINON TMDL

Chollas Creek Diazinon TMDL, November 3, 2003

Final Diazinon WLA

The below concentration-based waste load allocations are applied equally to all diazinon discharge sources in the Chollas Creek watershed:

Waterbody	Diazinon (ng/L)	
	Acute (1 hour ave)	Chronic (4 day ave)
Chollas Creek	72	45

Final Diazinon WLA Specific to the Department

The final WLA for the Department is noted above.

Final Diazinon Deadlines

The TMDL states that the phased compliance schedule will apply only to attainment of numeric limitations for diazinon and all other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits.

Department Diazinon Contribution

In the supporting technical documentation, the San Diego Regional Water Board stated that the Department is responsible for the major freeways and roadways making up approximately four percent of the land in the watershed; that the Department reports diazinon is not used; and that the Department has an integrated pest management plan. Since the Department does not use Diazinon it is in compliance with the prohibition of discharge.

G. Selenium TMDL Pollutant Category

General Description of Pollutant Category

Sources of Pollutant & How it Enters the Waterway

Selenium is naturally occurring in geologic formations, soils and aquatic sediments. Storm water runoff, dewatering, ground water seepage, irrigation of high selenium content soils, and oil refineries are identified as sources of selenium to surface waters in southern California. Generally, atmospheric deposition was determined to be a not significant source. Selenium bioaccumulates to levels that cause severe impacts on invertebrates, fish, birds that prey on fish, and humans.

Watershed Contribution

Selenium in soil may be a contributing source, and naturally occurring selenium in groundwater may be a significant source.

Control Measures

As discussed under the individual TMDLs below, the TMDLs in this pollutant category generally establish that the Department is a relatively minor source of selenium since the sources of selenium are not transportation related. The Department is expected to continue its current pollutant control activities in order to remain in compliance with the TMDLs.

LOS ANGELES REGION SELENIUM TMDL

Ballona Creek Metals and Selenium TMDL, December 22, 2005 and reaffirmed on October 29, 2008.

This TMDL addresses dry- and wet-weather discharges of metals and selenium in Ballona Creek and Sepulveda Canyon Channel. There are significant differences in the sources of metals and selenium loadings during dry and wet weather because hardness values and flow conditions in Ballona Creek and Sepulveda Canyon Channel vary between dry and wet weather. A grouped mass-based waste load allocation is developed for the storm water permittees that includes the Department.

Final Selenium WLA

The Department and MS4 storm water NPDES permittees will be found to be effectively meeting the dry-weather WLAs if the instream pollutant concentrations or load at the first downstream monitoring location is equal to or less than the corresponding concentration- or load based WLA.

Selenium Dry-weather Storm Water WLAs Apportioned between Storm Water Permits (grams total recoverable metals/day)

Permittee	Waste Load Allocation (grams/day)
Ballona Creek	
MS4 Permittees	169
Department	2
Sepulveda Channel	
MS4 Permittees	76
General Industrial	1

Selenium Wet-weather Storm Water WLAs Apportioned between Storm Water Permits (total recoverable metals)

Permittee	Waste Load Allocation (grams/day)
MS4 Permittees	4.73E-06 x Daily storm volume (L)
Department	6.59E-08 x Daily Storm Volume (L)
General Construction	1.37E-07 x Daily storm volume (L)
General Industrial	3.44E-08 x Daily storm volume (L)

The Department and MS4 NPDES permittees will be found to be effectively meeting the wet-weather WLAs if the loading at the most downstream monitoring location is equal to or less than the wet-weather WLA.

Final Selenium WLA Specific to the Department

See Tables above for specific Department WLAs.

Final Deadlines

The implementation schedule for the MS4 permittees and the Department consists of a phased approach, with compliance to be achieved in prescribed percentages of the watershed, with total compliance to be achieved within 15 years. The Department shall demonstrate that 100 percent of the total drainage area served by the MS4 system is effectively meeting the dry-weather and wet-weather WLAs.

Whereas the Department is responsible for meeting their mass-based waste load allocations they may choose to work with the MS4 Permittees.

Department’s Selenium Contribution (relative contribution to pollutant loading)

The Department’s relative contribution to the selenium loading is not known.

Calleguas Creek, its Tributaries and Mugu Lagoon Metals and Selenium TMDL, March 26, 2007

Significant sources were identified as urban runoff, agricultural runoff, groundwater seepage and POTW effluent. The Department is a participant in the watershed-wide water monitoring program.

Final Selenium WLA

Dry-weather is defined as days when flows in the stream are less than the 86th percentile flow rate for each reach; wet weather is defined as flows greater than 86th percentile. The daily maximum interim limit is set equal to the 99th percentile of available discharge data, the monthly average interim limit is set equal to the 95th percentile. The interim WLAs for dry-weather in Revolon Slough are 14 µg/L criteria maximum concentration (CMC), and 13 µg/L criteria continuous concentration (CCC) for wet-weather. There is no interim wet-weather WLA because current loads do not exceed the TMDL. In this TMDL interim limits and WLAs are applied to receiving waters.

Final Selenium WLA Specific to the Department

Final WLAs for selenium in Revolon Slough are:

Dry weather: In lbs/day are 0.004 low flow, 0.003 average flow, 0.004 elevated flow.

Wet weather: In lbs/day is $0.027*Q^2+0.47*Q$, where Q equals the daily storm volume.

Current loads do not exceed the loading capacity during wet weather, therefore no additional action by the Department is needed during wet weather.

Final Deadlines

The TMDL states that storm water dischargers are expected to achieve compliance through implementation of BMPs. A group watershed monitoring plan was required and receiving water monitoring compliance points are specified for all dischargers subject to the TMDL. A 25 percent reduction was required by March 2012, and a 50 percent reduction is required by March 2017. Final compliance is required by March 2022. The TMDL states that achievement of required reductions will be evaluated based on progress towards BMP implementation as outlined in the UWQMPs and in consideration of background loading information. The requirements of Attachment IV, Section III.G are consistent with the requirements of the TMDL.

Department's Selenium Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the selenium pollutant loading is not known.

San Gabriel River and Impaired Tributaries Metals and Selenium TMDL, March 26, 2007

The San Gabriel River and impaired tributaries metals and selenium TMDL was established by U.S. EPA (and therefore there are no milestones, compliance schedule, or monitoring requirements) and includes a dry-weather TMDL for selenium in San Jose Creek Reach 1.

The TMDL notes that selenium is present in local marine sedimentary rocks and presumes that much of the selenium in San Jose Creek results from natural soils, and that this assumption is corroborated by the fact that many of the impairments in San Jose Creek occur after the channel becomes soft-bottomed. Other potential sources were identified as mobilization of groundwater, such as by dewatering, irrigation of soils naturally high in selenium, and discharges from petroleum-related activities.

The requirements of Attachment IV, Section III.G are consistent with the requirements of the TMDL.

Final WLA for Selenium

The TMDL sets a dry-weather selenium WLA of five (5) µg/L for all storm water discharges to San Jose Creek. The TMDL states that a review of the storm water permits indicates that the Department discharges entirely to municipal storm water systems.

Final Selenium WLA Specific to the Department

No specific selenium WLAs are assigned to the Department. The dry-weather WLAs for the storm water permittees are shared by the MS4 permittees and the Department because there is not enough data on the relative extent of MS4 and the Department's areas.

Final Deadlines for Selenium

The MS4 permittees and the Department shall demonstrate that 100 percent of the total drainage area served by the storm drain system is effectively meeting both the dry-weather and wet-weather WLAs and attaining water quality standards for metals and selenium.

Department's Selenium Contribution (relative contribution to pollutant loading)

The Department's relative contribution to selenium pollutant loading is not known.

H. Temperature TMDL Pollutant Category

General Description of Pollutant Category

The North Coast Region Basin Plan defines the water quality objective for temperature as follows:

(1) For estuaries, the Basin Plan incorporates by reference the statewide plan entitled "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California."

(2) The following temperature objectives apply to surface waters:

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than five degrees Fahrenheit

above natural receiving water temperature. At no time or place shall the temperature of WARM intrastate waters be increased more than five degrees Fahrenheit above natural receiving water temperature.

The designated beneficial uses affected by thermal pollution of receiving waters include: cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); and spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); and contact and non-contact water recreation (REC-1 and REC-2).

Sources of Pollutant & How it Enters the Waterway

Anthropogenic processes that influence water temperature include changes to stream shade, stream flow via changes in groundwater accretion, streamflow via surface water use, changes to local microclimates, and channel geometry. Road construction and maintenance can, for example, involve the removal of some riparian vegetation, thus increasing ambient water temperature along the affected segment of a surface water body unless this impact is minimized via re-planting and/or by reducing the amount of vegetation removed.

Natural sources of sediment which can increase receiving water temperatures include geologically unstable areas that are subject to landslides, as well as smaller sediment sources such as gullies and stream-bank failures. Anthropogenic sources include road-related stream crossing failures, gullies, fill failures, and landslides precipitated by road-related surface erosion and cut bank failures. Road-related activities which can increase sediment discharge to a waterway include the construction and maintenance of paved and unpaved roadways, watercourse crossing construction, reconstruction, maintenance, use, and obliteration, and many activities conducted on unstable slopes. Unstable areas are areas with a naturally high risk of erosion and areas or sites that will not reasonably respond to efforts to prevent, restore or mitigate sediment discharges. Unstable areas are characterized by slide areas, gullies, eroding stream banks, or unstable soils that are capable of delivering sediment to a watercourse. Slide areas include shallow and deep seated landslides, debris flows, debris slides, debris torrents, earthflows, headwall swales, inner gorges and hummocky ground. Unstable soils include unconsolidated, non-cohesive soils and colluvial debris.

Watershed Contribution

The Department is a relatively minor source of pollutants and small percentage of the watershed. The Department will address the highest problem areas soonest and therefore address the problem at the appropriate level for the temperature and sediment TMDLs.

Control Measures

Dischargers responsible for vegetation removal are encouraged (and sometimes required) to preserve and restore such vegetation where possible. This may include planting riparian trees, minimizing the removal of vegetation that provides shade to a water body, and minimizing activities that might suppress the growth of new or existing vegetation. Reductions in sediment loads are expected to increase the number and depth of pools in

streams and rivers, and to reduce wetted channel width/depth ratios. These changes would tend to result in lower stream temperatures overall and in more lower-temperature pool habitat.

The Department is required to implement control measures to prevent erosion and sediment discharge. The measures that control the discharge of sediment can be effective in reducing thermal pollution in receiving waters. This can be achieved by protecting hillsides, intercepting and filtering runoff, avoiding concentrated flows in natural channels and drains, and avoidance of alterations of natural runoff flow patterns.

The sediment control requirements in Attachment IV are intended to reduce the adverse impacts of excessive sediment discharges to sediment-impaired waters, including impacts to the cold water salmonid fishery and the COLD, COMM, RARE, SPWN, and MIGR beneficial uses. The beneficial uses associated with the cold water salmonids fishery are often the most sensitive to sediment discharges.

The Sediment TMDL Implementation Policy also directs staff to develop: (1) the Work Plan, which describes how and when permitting and enforcement tools are to be used; (2) the Guidance Document on Sediment Waste Discharge Control; (3) the Sediment TMDL Implementation Monitoring Strategy; and (4) the Desired Conditions Report. Of these items, the Guidance Document on Sediment Waste Discharge Control and the Sediment TMDL Implementation Monitoring Strategy are still under development by the North Coast Region. At present, the requirements in Attachment IV are generally sufficient to address the sediment/temperature TMDLs in the North Coast Region that originate from a comparatively minor pollutant source, and this is accomplished by focusing on the most problematic areas and activities within this relatively low-volume subset of anthropogenic discharges for this pollutant category.

Attachment IV requires continuation of existing monitoring plans, or monitoring consistent with the TMDLs' requirements as approved by the Regional Water Board Executive Officer. A primary focus of the monitoring required by Attachment IV is management practice effectiveness monitoring and "Adaptive Management" for BMP implementation requirements ensures compliance with the sediment/temperature TMDLs.

The North Coast Regional Water Board is also in the process of amending its basin plan for the control of thermal pollution. These revisions will add a policy for implementing the water quality objective for temperature. The amendment will also add additional action plans to implement total maximum daily loads for temperature in the Navarro, and Eel, and Mattole watersheds.

The proposed revisions to the Basin Plan include changes to Chapter 4 –Implementation Plans. The Regional Water Board directed staff to prepare an amendment incorporating a temperature implementation policy into the Basin Plan by adoption of resolution R1-2012-0013. The proposed Basin Plan amendment will describe the approach to implementing the interstate water quality objective for temperature in one cohesive policy. It will identify the

regulatory mechanisms staff will employ to ensure achievement of the water quality objective for temperature, it will describe the significance of stream shade as a factor determining stream temperatures, and it will direct staff to address temperature concerns through existing authorities and processes.

The proposed Basin Plan amendment will also establish implementation plans for the Navarro, Mattole, Upper Main Eel, Middle Main Eel, Lower Eel, Middle Fork Eel, North Fork Eel, and South Fork Eel River temperature TMDLs.

NORTH COAST REGION TEMPERATURE TMDLS

Eel River (Lower HA) Temperature and Sediment TMDL, U.S. EPA Established on December 18, 2007

Final Temperature WLA

For the diffuse permitted sources, such as municipal and industrial storm water discharges, the Department's facilities, construction sites, and municipalities, as well as for discharges that are subject to NPDES permits but are not currently permitted, the waste load allocation (WLA) is expressed as follows: zero net increase in receiving water temperature.

Final Temperature WLA Specific to the Department

As stated above, U.S. EPA's wasteload allocation for the temperature TMDL assigned to the Department and other point source dischargers is zero net increase in receiving water temperature.

Final Temperature Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Contribution (relative contribution to pollutant loading)

U.S. EPA states that although nonpoint sources are responsible for most heat loading in the watershed, point sources may also discharge some heat in the watershed.

Eel River (Middle-Fork) Eden Valley, and Round Valley HSAs Temperature and Sediment TMDL, U.S. EPA Established on December 2003

Final Temperature WLA

Although U.S. EPA states that because appropriate heat loads, water temperatures and tree heights cannot be generalized on a basin-wide scale, this reduction is best achieved by allowing trees to grow so as to provide the equivalent amount of shade that would be provided under natural conditions. In addition, measures to reduce sediment discharge and promote establishment or protection of additional refugia pool areas will facilitate attainment of water quality standards. In this sense, the temperature and sediment TMDLs overlap to some degree.

Final Temperature WLA Specific to the Department

Please see above discussion of the temperature WLA.

Final Temperature Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Temperature Contribution (relative contribution to pollutant loading)

U.S. EPA states that although nonpoint sources are responsible for most heat loading in the watershed, point sources may also discharge some heat in the watershed.

Eel River (South Fork) HA Temperature and Sediment TMDL, U.S. EPA Established on December 16, 1999

U.S. EPA's source analysis indicates that the sediment loading due to nonpoint erosion from roads and other anthropogenic activities accounts for a substantial portion of the total sediment loading in this watershed.

The waste load allocation for point sources are for sediment only, i.e., they are not directly related to the temperature portion of the TMDL, nor does U.S. EPA set a waste load allocation for point sources under the temperature portion of the TMDL. However, U.S. EPA also states that any improvements in stream temperature from reduced sedimentation contribute to the cumulative benefits of both sediment and temperature load reductions, and this assumption is accommodated in U.S. EPA's calculations for the margin of safety in this TMDL.

Final Temperature WLAs

As stated above, there is no wasteload allocation for point sources.

Final Temperature WLA Specific to the Department

As stated above, there is no specific wasteload allocation for the Department.

Final Temperature Deadlines

U.S. EPA did not specify deadlines for implementation.

Department's Temperature Contribution to Thermal Loading (relative contribution to pollutant loading)

U.S. EPA attributes most sediment and thermal pollutant loading in the TMDL to nonpoint sources, and considers the Department's and other point source contributions to be comparatively minor.

Eel River (Upper Main HA) Temperature and Sediment TMDL, U.S. EPA Established on December 29, 2004

Final Temperature WLA

U.S. EPA states that there are no point source discharges included in the temperature TMDL for purposes of attaining temperature reductions via “shade allocation,” so the waste load allocation is set to zero. U.S. EPA states that permitted sources of increased water temperatures and sediment loading, if they occur in the future, will be attributable only to construction-related storm water discharges.

Final Temperature WLA Specific to the Department

As stated above, U.S. EPA stated that there are no point source discharges for thermal pollution, so the wasteload allocation for all point source discharges (including the Department) is set to zero.

Final Temperature Deadlines

U.S. EPA did not specify deadlines for implementation.

Department’s Temperature Contribution (relative contribution to pollutant loading)

U.S. EPA considers all point sources of temperature pollution to be insignificant for purposes of this TMDL.

Klamath River in California Temperature, Dissolved Oxygen, Nutrients, and Microcystin TMDL, December 28, 2010

Final Temperature WLA

The Iron Gate Fish Hatchery was identified as the only point-source heat load in the Klamath River watershed: The interstate water quality objective for temperature prohibits the discharge of thermal waste to the Klamath River, and therefore the waste load allocation for Iron Gate Hatchery is set to zero, as monthly average temperatures. The TMDL addresses elevated temperatures from natural and non-point anthropogenic sources. The non-point sources include: (1) excess solar radiation, expressed as its inverse, shade; (2) heat loads associated with increased sediment loads; (3) heat loading from impoundments; and (4) heat loads from Oregon. The assigned load allocations for temperature are expressed as follows (as adapted from Table 4-15 in the basin plan):

Source	Allocation
Excess Solar Radiation (expressed as effective shade)	The shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire.
Increased Sediment Loads	Zero temperature increase caused by substantial human-caused sediment-related channel alterations.
Impoundment Discharges	Zero temperature increase above natural temperatures ¹
Excess Solar Radiation	The shade provided by topography and full potential

Source	Allocation
(expressed as effective shade)	vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire.
Increased Sediment Loads	Zero temperature increase caused by substantial human-caused sediment-related channel alterations. ²
Impoundment Discharges	Zero temperature increase above natural temperatures

1. Natural temperatures are those water temperatures that exist in the absence of anthropogenic influences, and are equal to natural background.
2. Substantial human-caused sediment-related channel alteration: “A human-caused alteration of stream channel dimensions that increases channel width, decreases depth, or removes riparian vegetation to a degree that alters stream temperature dynamics and is caused by increased sediment loading.”

Final Temperature WLA Specific to the Department

The Department was not assigned a waste load allocation for temperature.

Final Deadlines

No deadlines were specified.

Department’s Pollutant Contribution (relative contribution to pollutant loading)

The Department is listed as a source of thermal pollution: however, the relative magnitude of the Department’s contribution to thermal pollution was not specified or estimated.

Navarro River Sediment and Temperature TMDL, U.S. EPA Established on December 27, 2000

Final Temperature WLA

U.S. EPA states that there are no known point sources of heat to the Navarro or its tributaries. The source analysis therefore focused on non-point sources. The wasteload allocation any for point sources which might be present is thus presumed to set to zero.

The Navarro River TMDLs for temperature and sediment are based on separate analyses. Reduced sediment loads could be expected to lead to increased frequency and depth of pools and to reduced wetted channel width/depth ratios. These changes would tend to result in lower stream temperatures overall and in more lower-temperature pool habitat.

Improvements in stream temperature that may result from reduced sedimentation were not considered in the analysis.

Final Temperature WLA Specific to the Department

The Department is not specifically mentioned as a source of pollutant loading for temperature, therefore the wasteload allocation for the Department is presumed to be set to zero.

Final Temperature Deadlines

U.S. EPA did not specify deadlines for implementation of this TMDL.

Department's Temperature Contribution (relative contribution to pollutant loading)

As mentioned above, neither the Department nor other point sources are identified as sources of pollutant loading for temperature or sediment, so U.S. EPA has determined that these potential sources are insignificant in this TMDL.

Scott River Sediment and Temperature TMDL, August 11, 2006**Final Temperature WLA**

U.S. EPA states that there are no point sources for temperature related discharges within the area encompassed by this TMDL, so the waste load allocation is set to zero.

Final Temperature WLA Specific to the Department

U.S. EPA directed Regional Water Board staff shall evaluate the effects of the Department's state-wide NPDES permit, storm water permit, and waste discharge requirements (collectively known as the Department's Storm Water Program) by September 8, 2008. The evaluation shall determine the adequacy and effectiveness of the Department's Storm Water Program in preventing, reducing, and controlling sediment waste discharges and elevated water temperatures in the North Coast Region, including the Scott River watershed.

Final Temperature Deadlines

U.S. EPA did not establish specific wasteload allocations for point sources, so the wasteload allocations are set to zero.

Department's Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the temperature pollutant loading is not known.

Shasta River Dissolved Oxygen and Temperature TMDL, U.S. EPA Established on December 26, 2007**Final Temperature WLA**

There are no point source heat loads in the Shasta River watershed, and therefore no waste load allocations apply.

Final Temperature WLA Specific to the Department

The Department was not assigned a waste load allocation for temperature: as stated above, there are no point sources of heat loads in the Shasta River watershed.

Final Deadlines

No deadlines were specified.

Department’s Pollutant Contribution

The Department’s relative contribution to the temperature pollutant loading in Shasta River Watershed is not known.

I. Chloride Pollutant Category**General Description of Pollutant Category**

The Department is named as a responsible party in the Santa Clara River watershed chloride TMDL.

Sources of Pollutant & How it Enters the Waterway

Chloride in the Santa Clara River watershed is principally due to increased salt loadings from imported water and the use of self-regenerating water softeners.

Watershed Contribution

The Department does not import water and does not use self-generating water softeners.

Control Measures

The Department is expected to be in compliance with the chloride WLA without any additional control actions as long as the Department is in compliance with this Order.

LOS ANGELES REGION CHLORIDE TMDLS***Santa Clara River Reach 3 Chloride TMDL, U.S. EPA Established on June 18, 2003***

There are two major sources that discharge into Reach 3, the Santa Paula and Fillmore WRPs, that comprise approximately 80 percent of the total estimated load under flow conditions.

The Department is one of five minor point sources that discharge to Reach 3. Although the Department is a minor source, the minor discharges to the Santa Clara River are typically related to dewatering and construction projects that are covered by other NPDES permits.

Final Chloride WLA**Estimated Chloride Loads to Reach 3 Under Low Flow Conditions**

Point Sources	Waste Load Allocation (mg/L)
Fillmore WRP	80
Santa Paula WRP	80
MS4 Stormwater	80

Point Sources	Waste Load Allocation (mg/L)
Construction General Permit	80
Department	80
Other Minor Permits	80
NonPoint Sources	Load Allocation (mg/L)
Other Tributaries to Reach 3*	80
Sespe Creek	40
Santa Clara Reach 4	100
Total	80
* Although other tributaries to Reach 3 were not included in the linkage analysis above, their contributions to Reach 3 chloride loads and flows are believed to be insignificant.	

Final Chloride WLA Specific to the Department

Specific WLA for the Department is 80 mg/L.

Final Chloride Deadlines

U.S. EPA established this TMDL and it became effective on June 18, 2003. The Department is expected to be in compliance with the Chloride WLA without any additional control actions as long as the Department is in compliance with this Order.

Department's Chloride Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the chloride pollutant loading in the Santa Clara River Reach 3 is not known.

Upper Santa Clara River Chloride TMDL, April 6, 2010

The principal source of chloride in the Upper Santa Clara River is discharges from the Saugus WRP and Valencia WRP, which are estimated to contribute 70 percent. These sources of chloride accumulate and degrade groundwater in the lower area east of Piru Creek in the basin.

Final Chloride WLA

Other minor NPDES discharges receive conditional WLAs shown below.

Reach	Concentration-based Conditional WLA for Chloride (mg/L)
6	150 (12-month Average)
	230 (Daily Maximum)
5	150 (12-month Average)
	230 (Daily Maximum)
4B	117 (3-month Average)
	230 (Daily Maximum)

Final Chloride WLA Specific to the Department

The Department is assigned the above concentration based WLAs.

Final Chloride Deadlines

The interim and final WLAs for TDS and sulfate contained in the Basin Plan Amendment are essentially established for the principal sources. The Department does not import water and does not use self-generating water softeners. The Department is expected to be in compliance with the Chloride WLA without any additional control actions as long as the Department is in compliance with this Order.

Department's Chloride Contribution (relative contribution to pollutant loading)

The Department's relative contribution to the chloride pollutant loading in the Upper Santa Clara River is not known.

Region Specific Requirements

The Regional Water Boards have identified specific areas within their Regions requiring special conditions (Attachment V). These special conditions are needed to account for the unique value of the resource(s) within the Region, special pollutant or pollution control issues within the Region, or storm water management and compliance issues applicable to the Region. These special requirements need not be applied statewide but are applicable only to Department discharges within the Regions as specified in Attachment V. Region specific requirements are included for the North Coast, San Francisco Bay, and Lahontan Regional Water Boards.

North Coast Region

1. Sediment. Region specific requirements addressing sediment discharges in sediment-impaired watersheds in the North Coast Region are based on the "Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters in the North Coast Region," as included in the Basin Plan and Resolution No. R1-2004-0087. The Policy requires the use of NPDES permits and waste discharge requirements to achieve compliance with sediment-related water quality standards. The requirements in Attachment V to systematically inventory, prioritize, control, monitor, and adapt, as well as to include a time schedule in the annual District Workplan, are consistent with region-wide excess sediment control regulations.

The sediment requirements are intended to reduce the adverse impacts of excessive sediment discharges to sediment-impaired waters, including impacts to the cold water salmonid fishery and the COLD, COMM, RARE, SPWN, and MIGR beneficial uses. The beneficial uses associated with the cold water salmonid fishery are often the most sensitive to sediment discharges. Risks to salmonids from excessive sediment are well documented in scientific literature and include:

- the filling of pools and subsequent reduction in available in-stream salmonid habitat;
- burial of spawning gravels;
- gill abrasion and death due to extremely high turbidity levels;
- reduction in macroinvertebrate populations available as food for salmonids; and

- alterations in channel geometry to a wider, shallower channel which is subject to increases in solar heating.
2. Riparian Vegetation Requirements. Region specific requirements to protect and restore riparian vegetation are based on the Water Quality Objective for temperature. The temperature objective states, in part, that the natural receiving water temperature shall not be altered unless it can be demonstrated that such alteration does not adversely affect beneficial uses. Removal of riparian vegetation associated with Department activities has the potential to decrease shade, increase solar radiation, and raise water temperatures, and may therefore cause an exceedance of the temperature objective.

The requirements in Attachment V direct the Department to protect and restore riparian vegetation to the greatest extent feasible. In many cases, activities involving the removal of riparian vegetation will require a 401 water quality certification, which will contain more specific conditions regarding the removal and/or establishment of vegetation.

These requirements are intended to prevent alterations to natural receiving water temperature from Department activities. The primary mechanism in which riparian vegetation influences water temperature is through the shade. Loss of riparian vegetation and the shade that it provides can lead to increased solar radiation, hotter water temperatures, and adverse impacts to beneficial uses. The beneficial uses most sensitive to increases in water temperature are often those associated with the cold water salmonid fishery. Risks to salmonids are well documented in scientific literature and include:

- reduced feeding rates and growth rates;
- impaired development of embryos and alevins;
- changes in the timing of life history events, such as upstream migration, spawning, and seaward migration;
- increased disease infection rates and disease mortality; and
- direct mortality.

San Francisco Bay Region

The Urban Runoff Management, Comprehensive Control Program section of the Basin Plan (Chapter 4.14) requires municipalities and local agencies, including the Department, to address existing water quality problems and prevent new problems associated with urban runoff through the development and implementation of a comprehensive control program focused on reducing current levels of pollutant loading to storm drains to the maximum extent practicable.

The Highway Runoff Control Program section of the Basin Plan (Chapter 4.14.2) requires the Department to manage and monitor pollutant sources from its ROW through development and implementation of a highway runoff management plan.

The Basin Plan comprehensive and highway runoff program requirements are designed to be consistent with federal regulations (40 C.F.R., §§ 122-124) and are implemented through issuance of NPDES permits to owners and operators of MS4s. A summary of the regulatory provisions is contained in Title 23 of the California Code of Regulations at section 3912. The Basin Plan identifies beneficial uses and establishes water quality objectives for surface waters in the Region, as well as effluent limitations and discharge prohibitions intended to protect those uses. The region-specific requirements in Attachment V of this Order implement the plans, policies, and provisions of the Regional Water Board's Basin Plan.

1. Trash Load Reduction.

a. Legal Authority. The following legal authorities apply to the trash load reduction requirements specified in Attachment V:

- Clean Water Act sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 Code of Federal Regulations sections 122.26(d)(2)(i)(B, C, D, E, and F) and 40 Code of Federal Regulations section 122.26(d)(2)(iv).
- Federal NPDES regulations 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B) requires, "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."
- Federal NPDES regulation 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(2) requires, "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."
- Federal NPDES regulation 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(3) requires, "a description of procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."
- Federal NPDES regulations 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(4) requires, "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."
- San Francisco Bay Basin Plan, Chapter 4 – Implementation, Table 4-1 Prohibitions, Prohibition 7, which is consistent with the State Water Board's Enclosed Bays and Estuaries Policy, Resolution 95-84, prohibits the discharge of rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas. This prohibition was adopted by the Regional Water Board in the 1975 Basin Plan, primarily to protect recreational uses such as boating.

- b. Extent, Impacts, and Conclusions. Trash²⁵ and litter are a pervasive problem near and in creeks and in San Francisco Bay having major impacts on the environment, including aquatic life and habitat in those waters. Ubiquitous, unacceptable levels of trash in waters of the San Francisco Bay Region warrant a comprehensive and progressive program of education, warning, and enforcement, and certain areas warrant consideration of structural controls and treatment. Trash in urban waterways of coastal areas can become *marine debris*, known to harm fish and wildlife and cause adverse economic impacts.²⁶ It accumulates in streams, rivers, bays, and ocean beaches throughout the San Francisco Bay Region, particularly in urban areas.

Trash adversely affects numerous beneficial uses of waters, particularly recreation and aquatic habitat. Not all litter and debris delivered to streams are of equal concern with regard to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is to wildlife in the form of entanglement or ingestion.^{27,28} Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass.²⁹ Also, some household and industrial wastes can contain toxic batteries, pesticide containers, and fluorescent light bulbs containing mercury. Large trash items such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistent accumulation of trash in a waterbody is of particular concern, and signifies a priority for prevention of trash discharges. Also of concern are trash *hotspots* where illegal dumping, littering, and/or accumulation of trash occur.

The narrative water quality objectives applicable to trash are Floating Material (Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses), Settleable Material (Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses), and Suspended Material (Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses).

²⁵ For the purposes of this provision, trash is defined to consist of litter and particles of litter. Man-made litter is defined in California Government Code section 68055.1 (g): *Litter* means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing.

²⁶ Moore, S.L., and M.J. Allen. 2000. Distribution of anthropogenic and natural debris on the mainland shelf of the Southern California Bight. *Mar. Poll. Bull.* 40:83-88.

²⁷ Laist, D. W. and M. Liffmann. 2000. *Impacts of marine debris: research and management needs*. Issue papers of the International Marine Debris Conference, Aug. 6-11, 2000. Honolulu, HI, pp. 16–29.

²⁸ McCauley, S.J. and K.A. Bjorndahl. 1998. Conservation implications of dietary dilution from debris ingestion: sublethal effects in post-hatchling loggerhead sea turtles. *Conserv. Biol.* 13(4):925-929.

²⁹ Sheavly, S.B. 2004. *Marine Debris: an Overview of a Critical Issue for our Oceans*. 2004 International Coastal Cleanup Conference, San Juan, Puerto Rico. The Ocean Conservancy.

The Regional Water Board, at its February 11, 2009 hearing, adopted a resolution proposing that 26 waterbodies be added to the 303(d) list for trash. The adopted Resolution and supporting documents are contained in Attachment 10.1 – 303(d) Trash Resolution and Staff Report, February 2009.

Data collected by Regional Water Board staff using the SWAMP Rapid Trash Assessment (RTA) Protocol,³⁰ over the 2003–2005 period,³¹ suggest that the current approach to managing trash in waterbodies is not reducing the adverse impact on beneficial uses. The levels of trash in the waters of the San Francisco Bay Region are high, even with the Basin Plan prohibitions and potentially large fines. During dry weather conditions, a significant quantity of trash, particularly plastic, is making its way into storm drains and being transported downstream to San Francisco Bay and the Pacific Ocean. On the basis of 85 surveys conducted at 26 sites throughout the Bay Area, staff have found an average of 2.93 pieces of trash for every foot of stream, and all the trash was removed when it was surveyed, indicating high return rates of trash over the 2003–2005 study period.

A number of key conclusions can be made from the RTA study:

- Lower watershed sites have higher densities of trash.
 - All watersheds studied in the San Francisco Bay Region have high levels of trash.
 - There are trash source hotspots, usually associated with parks, schools, or poorly kept commercial facilities.
 - Dry season deposition of trash, associated with wind and dry season runoff, contributes measurable levels of trash to downstream locations.
 - The majority of trash is plastic at lower watershed sites where trash accumulates in the wet season. This suggests that urban runoff is a major source of floatable plastic found in the ocean and on beaches as marine debris.
 - Parks that have more evident management of trash by city staff and local volunteers, including cleanup within the creek channel, have measurably less trash and higher RTA scores.
- c. Trash Reduction measures shall demonstrate compliance through timely implementation of controls in all high trash generating areas for the prohibition of discharge of trash and include the following:
- Implementation of full capture systems, treatment controls, and/or enhanced maintenance controls for storm drains or catchment that service the significant trash generating areas.
 - Coordinate with neighboring MS4 permittees to construct, operate and maintain those controls listed above.

³⁰ SWAMP Rapid Trash Assessment Protocol, Version 8

³¹ SWAMP S.F. Bay Region Trash Report, January 23, 2007

- Assess for the effectiveness of enhanced maintenance controls implemented in high generating trash areas, as well as coordination with local municipalities.
 - Abate trash from construction and reconstruction projects.
 - Include trash capture devices on the outlets of treatment systems for new and redeveloped highway projects to achieve the full trash capture standard.
 - Report in each Annual Report, as part of the TMDL STATUS REVIEW REPORT a per District summary of trash reduction controls and their effectiveness.
- d. Costs of Trash Control. Costs for either enhanced trash management measure implementation or installation and maintenance of trash capture devices are significant, but when spread over several years, and when viewed on a per-capita basis, are reasonable. To meet Basin Plan and local MS4 requirements, trash capture devices have already been installed by other municipalities in the Bay Area.

Cost information on various trash capture devices is included in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) BMP Trash Toolbox (July 2007). The Toolbox contains cost information for both trash capture devices and enhanced trash management measure implementation, covers a broad range of options, and also discusses operation and maintenance costs.

2. Storm Water Pump Stations. In late 2005, Regional Water Board staff investigated an occurrence of low salinity and dissolved oxygen conditions in Old Alameda Creek (Alameda County) and Alviso Slough (Santa Clara County). In the case of Old Alameda Creek, discharge of black-colored water from the Alvarado pump station to the slough was observed at the time of the data collection on September 7, 2005, confirming dry weather urban runoff as the source of the violations of the five (5) mg/L dissolved oxygen water quality objective. Such conditions were measured again on September 21, 2005.

On October 17, 2005, waters in Alviso Slough were much less saline than the salt ponds and had the lowest documented dissolved oxygen of the summer, suggesting a dry weather urban runoff source. The dissolved oxygen sag was detected surface to bottom at 2.3 mg/L at a salinity of less than one part per thousand (ppt), mid-day, when oxygen levels should be high at the surface. The sloughs have a typical depth of six feet.

Board staff's investigations of these incidents, documented in a memorandum,³² found that "storm water pump stations, universally operated by automatic float triggers, have been confirmed as the cause in at least one instance, and may represent an overlooked source of controllable pollution to the San Francisco Bay Estuary and its tidal sloughs... [that] discharges of dry weather urban runoff from these pump stations are not being managed to protect water quality, and [that] surveillance monitoring has detected measurable negative water quality consequences of this current state of pump station management."

³² Internal Water Board Memo dated December 2, 2005: "Dry Weather Urban Weather Urban Runoff Causing or Contributing to Water Quality Violations: Low Dissolved Oxygen (DO) in Old Alameda Creek and Alviso Slough."

Pump station discharges of dry weather urban runoff can cause violations of water quality objectives. These discharges are controllable point sources of pollution that are virtually unregulated. The Regional Water Board has determined that the measures included in Attachment V are necessary to address these discharges and water quality problems.

Lahontan Region

1. The Lahontan Basin Plan encourages the infiltration of storm water runoff to treat pollutants in discharges and mitigate the effects of increased runoff to surface waters from the addition of impervious surfaces. The 20-year, one-hour design storm has been historically applied and accepted as an effective requirement to mitigate discharges of storm water to surface waters in the sensitive high mountain watersheds of the Lahontan Region. Water Board staff has estimated that facilities designed to treat or infiltrate the 20-year, one-hour storm event effectively capture approximately 85 percent of the average annual runoff volume in the Lake Tahoe Basin. However, it is recognized that the natural environment provides adequate infiltration and/or treatment in areas where there is little or no connectivity to surface waters. Therefore the Lahontan Water Board encourages the Department to focus implementation of storm water treatment facilities in those areas that discharge directly to surface waters to maximize water quality benefits. This requirement is applicable to existing highways and facilities in the Mammoth Lakes Area Hydrologic Unit.
2. The Natural Environment as Treatment (NEAT) study has helped identify the priority areas within the Lake Tahoe Hydrologic Unit where storm water treatment and control measure implementation has the most benefit for water quality protection. Similarly, the NEAT study has helped identify those areas where there may be limited water quality benefits associated with implementing structural treatment and control measures. The NEAT approach is also applicable in other areas. This provision is needed to focus available resources on the areas where the most water quality benefit can be achieved.
3. The October 15 to May 1 grading prohibition is necessary to reduce erosion and sedimentation from disturbed areas within the sensitive high elevation areas within the Lahontan Region. These are areas where snow fall restricts the ability to control storm water pollution through the winter months. This requirement mitigates winter erosion issues by requiring disturbed soil areas to be winterized prior to the onset of snow, and allows for exceptions where there is a compelling need.

Regional Water Board Authorities

Regional Water Boards and their staff will oversee implementation and compliance with this Order. As appropriate, they will review reports, conduct inspections, and take enforcement actions on violations of this Order.

Cost of Compliance and Other MEP Considerations

General Cost Considerations in Storm Water Regulation and Management

The Department will incur incremental costs in implementing this Order, such as the cost of complying with the Order's storm water treatment BMP, post-construction, hydromodification, Low Impact Development, and monitoring and reporting requirements. The Department will also incur additional costs in following the iterative process as required by the Order. The cost of complying with TMDL waste load allocations is not considered since TMDLs are not subject to the MEP standard.

In adopting Order WQ 2000-11, the State Water Board found that cost is a relevant factor, among others such as feasibility and public acceptance that should be considered in determining MEP. The State Water Board considered the costs in preparing this Order and has determined that the costs reflect the MEP standard. The State Water Board further found in adopting Order WQ 2000-11 that in considering the cost of compliance, it is also important to consider the costs of impairment; that is, the negative impact of pollution on the economy and the positive impact of improved water quality. So, while it is appropriate and necessary to consider the cost of compliance, it is also important to consider the larger economic impacts of implementation of the storm water management program.

Many studies have been undertaken to assess the cost of compliance with storm water permits. Most studies have focused on municipal programs as opposed to "linear MS4s" or Departments of Transportation. A study by the Los Angeles Regional Water Board reported wide variability in the cost of compliance among municipal permit holders which was not easily explained (LARWQCB, 2003).

In 1999, U.S. EPA reported on multiple studies it conducted to determine the cost of urban runoff management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be \$9.16 per household. U.S. EPA also studied 35 Phase I municipalities, finding costs to be similar to those anticipated for Phase II municipalities, at \$9.08 per household annually (U.S. EPA, 1999a).

A program cost study was also conducted by the Los Angeles Regional Water Board, where program costs reported in the municipalities' annual reports were assessed. The Water Board estimated the average per household cost to implement the MS4 program in Los Angeles County was \$12.50.

The State Water Board also commissioned a study by California State University, Sacramento to assess costs of the Phase I MS4 program. This study is current and includes an assessment of costs incurred by the City of Encinitas in implementing its program. Annual cost per household ranged from \$18-46, with the City of Encinitas representing the upper end of the range (SWRCB, 2005). The cost of the City of Encinitas' program is understandable, given the city's coastal location, reliance on tourism, and additional costs resulting from a consent decree with environmental groups regarding its program. For these reasons, as well as the general recognition the city receives for implementing a superior program, the city's program cost can be considered as the high end of the spectrum for municipal storm water management program costs.

The California Department of Finance (Finance, 2003) conducted a comprehensive review of the Department's storm water program. Finance noted widely divergent compliance cost estimates produced by regulators and environmental organizations versus consultant's estimates. Finance also had difficulty identifying compliance costs because of the way storm water activities are integrated with other functions and allocated among the different divisions within the Department, and because they are funded from different sources. Finance made three findings related to cost:

- The projected costs of compliance are escalating.
- Storm water compliance costs are integrated into many of the Department's business processes and are not accurately tracked.
- As storm water compliance costs increase, the amount of funding available for highway projects decreases, which reduces the number of projects that can be constructed.

The review concluded that balancing costs and benefits is a difficult policy decision and there should be a recognition of the trade-offs associated with resource allocation decisions given the Department's limited resources.

It is important to note that storm water program costs are not all attributable to compliance with MS4 permits. Many program components and their associated costs existed before any MS4 permits were issued. For example, for the Department, storm drain maintenance, street sweeping and trash/litter collection costs cannot be solely or even principally attributable to MS4 permit compliance since these practices have long been implemented before the MS4 permit was issued. Even many structural BMPs (erosion protection, energy dissipation devices, detention basins etc.) are standard engineering practice for many projects and are not implemented solely to comply with permit provisions. Therefore, the true cost resulting from MS4 permit requirements is some fraction of the cost to operate and maintain the highway system.

The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of program costs was either pre-existing or resulted from enhancement of pre-existing programs (SWRCB, 2005). The County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement its Drainage Area Management Plan is less than 20 percent of the total budget. The remaining 80 percent is attributable to pre-existing programs (County of Orange, 2007). Any increase in cost to the Department by the requirements of this Order will be incremental in nature.

Storm water management programs cannot be considered solely in terms of their costs. The programs must also be viewed in terms of their value to the public. For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by U.S. EPA to be \$158-210 per household (U.S. EPA, 1999a). This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates U.S. EPA's estimates, reporting annual

household willingness to pay for statewide clean water to be \$180 (SWRCB, 2005). Though these costs may be assessed differently at the state level (for the Department) than at the municipal level, the results indicate that there is public support for storm water management programs and that costs incurred by the Department to implement its storm water management program remain reasonable.

It is also important to consider the cost of not implementing a storm water management program. Urban runoff in southern California has been found to cause illness in people bathing near storm drains (Haile et al., 1996). A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8 percent among bathers at those beaches resulted in about \$3 million annually in health-related expenses (Lin, 2005). Extrapolation of such numbers to the beaches and other water contact recreation areas in the state would increase these numbers significantly.

Storm water runoff and its impact on receiving waters also impacts the tourism industry. The California Travel and Tourism Commission (2009) estimated that in 2008 direct travel spending in California was \$97.6 billion directly supporting 924,000 jobs, with earnings of \$30.6 billion. Travel spending in 2008 generated \$1.6 billion in local taxes and \$2.8 billion in state taxes. Impacts on tourism from storm water runoff (e.g. beach closures) can have a significant impact on the economy. The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately eight miles of Huntington Beach were closed for two months in the middle of summer of 1999, impacting beach visitation and the local economy.

Cost Considerations Relative to the Department

In written comments and before the Board, the Department has stated that the requirements of the first public drafts would impose prohibitive costs on the Department at a time of economic difficulty and limited resources. State Water Board staff has carefully considered the Department's comments and revised the draft Tentative Order to continue to address critical water quality problems in consideration of the cost of compliance.

State Water Board staff completed a Draft Tentative Order and submitted it to the Department, U.S. EPA, and the Natural Resources Defense Council for informal stakeholder review in the fall of 2010. Further review was provided by the Regional Water Boards. Staff revised the Draft Tentative Order to address the informal comments received and released it for public review on January 7, 2011 (Draft Tentative Order). Approximately 330 comments from 16 commenters were received on the Draft Tentative Order, and a public hearing was held on July 19, 2011. Staff further revised the Draft Tentative Order and released a Revised Draft Tentative Order on August 18, 2011 (Revised Draft Tentative Order). Approximately 220 comments from 33 commenters were received on the Revised Draft Tentative Order, and a State Water Board workshop was held on September 21, 2011. In each set of comments and before the Board, the Department expressed significant concerns with the cost of compliance with the Tentative Orders.

On October 6, 2011, the California Senate Select Committee on California Job Creation and Retention held a hearing on the economic impacts of the State Water Board's three general or statewide storm water permits that were under renewal: the Phase II Small MS4 permit, the Industrial General Permit, and the Department's MS4 permit. The Executive Director of the State Water Board testified at the hearing that the comments regarding cost of compliance with the permits were being considered carefully and that the three permits required substantial revision to address the comments. State Water Board staff held bi-weekly meetings with the Department in October through December 2011 to discuss their concerns. Revisions resulting from these meetings are contained in the Second Revised Draft Tentative Order which was released for public review on April 27, 2012 (Second Revised Draft Tentative Order).

This section is a general discussion of the cost of compliance with the Second Revised Draft Tentative Order and of current expenditures by the Department to comply with the existing permit (Order 99-06-DWQ) (Existing Permit). It also discusses the more significant changes between the Revised Draft and Second Revised Draft Tentative Orders.

It is very difficult to precisely determine the true cost of implementation of the Department's storm water management program as affected by this Order. Due to the extensive, distributed nature of the Department's MS4, permit requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined, and the difficulty in isolating program costs attributable to permit compliance, only general conclusions can be drawn from this information.

The Department has made a number of estimates of the cost of complying with the Draft and Revised Draft Tentative Orders. Generally, the Department's estimates are based on worst-case scenarios or the most restrictive interpretation of the Tentative Orders. In a presentation to a meeting of the American Association of State Highway and Transportation Officials (AASHTO) on June 22, 2011,³³ the Department's Chief Environmental Engineer, Scott McGowen estimated the annual cost of compliance at \$281million. This estimate was based on the January 7, 2011 Draft Tentative Order. At the July 19, 2011 public hearing, the Department estimated the annual compliance cost at approximately \$450 million, based on the same January 7, 2011 Draft Tentative Order. At the September 21, 2011 State Water Board workshop, the Department estimated an annual compliance cost of \$904 million, based on the requirements of the August 18, 2011 Revised Draft Tentative Order. It should be noted that the August 18 draft removed or modified a number of provisions that were expected to reduce the cost of compliance.

Annual expenditures for the Department's storm water management program under the Existing Permit (DWQ 99-06) are provided in the Department's annual reports. For fiscal years 2007-08 through 2010-11, the Department reported annual personal services and

³³ Caltrans NPDES Tentative Order, Natural Systems and Ecological Communities Subcommittee at the National Planning and Environmental Practitioners Meeting. AASHTO, June 22, 2011.

operating expenses of \$93.8 million, \$93.6 million, \$75.2 million, and \$89.2 million. These figures do not include the cost of capital improvements needed to comply with the permit.

State Water Board staff estimated the capital expenditures for the Existing Permit in two ways. First, the Department provided the number of post-construction storm water treatment BMPs installed in 2009-10 and 2010-11 along with typical unit costs for each BMP. In 2007-08, the Department spent approximately \$74.7 million for 396 treatment BMPs, \$104.5 million in 2009-10 for 667 treatment BMPs, and \$75.7 million in 2010-11 for 506 treatment BMPs. The Department indicated that anomalies in the data for 2008-09 make them unreliable and they are therefore not included. The Department also indicated that the unit cost factors do not include costs for design, ROW and other related elements. The estimates therefore can be considered on the low side.

Second, capital expenditures were estimated from budget appropriations from the Department's State Highway Operation and Protection Program (SHOPP) as reported in the 2008-09 annual report. The SHOPP account is the primary source of funding for storm water-related capital expenses. Storm water compliance costs are not consistently reported in the annual reports; however, the 2008-09 annual report contains sufficient information to make an estimate. The capital value of the SHOPP "storm water mitigation element" for fiscal years 2009-10 through 2012-13 is \$640 million, including capital outlay support, or about \$160 million per year.

Using average personal services and operating expenses for the last four years (\$88 million) and average annual programmed SHOPP funding, the Department's expenditures to comply with the Existing Permit amount to approximately \$248 million.

As stated above, the Department has estimated cost of compliance with the Draft Tentative and Revised Draft Tentative Orders variously at \$281 to \$904 million. These estimates are based on "worst case scenarios" and on the most restrictive interpretations of the Orders' requirements. In preparing the Second Revised Tentative Order, staff worked to provide greater clarity and certainty to the Department on the scope of permit obligations and to eliminate compliance costs that were not expected to yield significant water quality benefits. With the exception of a lowering of the post-construction treatment threshold for non-highway facility projects from 10,000 square feet of new impervious surface to 5,000 square feet³⁴, no requirements have been added to the Second Revised Draft Tentative Order that would materially increase the cost of compliance over the Revised Draft Tentative Order. In contrast, a number of substantive requirements have been removed, replaced or modified from the Revised Draft Tentative Order with the goal of focusing the Department's limited resources on the most significant water quality issues. These changes are expected to result in a lower cost of compliance with the Second Revised Draft Tentative Order as compared to the Revised Tentative Order. These include:

³⁴ The threshold was lowered for consistency with the draft statewide Phase II Small MS4 General Permit and with regional MS4 permits.

1. Water quality monitoring program.
 - a. Replaced random compliance-driven monitoring approach with a tiered approach focusing on ASBS and TMDL watersheds, and deferring to the monitoring requirements specified in the ASBS Special Protections and TMDLs.
 - b. Deleted sampling pool, water quality action levels, and response process flow chart.
 - c. Removed 29 constituents from the monitoring constituent list.
 - d. Limited the monitoring for new constituents to TMDL watersheds.
 - e. For sites with existing monitoring data, limited BMP retrofits to 15 percent of the highest priority sites.
 - f. Deleted the long-term monitoring program.
 - g. Deleted maintenance facility compliance monitoring.
2. Project Planning and Design.
 - a. Raised the treatment threshold for highway projects from 5,000 square feet of new impervious surface to one acre.
 - b. Deleted the requirement for pilot Low Impact Development retrofits and effectiveness evaluations.
3. Hydromodification.
 - a. Removed requirement for programmatic stream stability assessments and a retrofit implementation schedule.
 - b. Raised the risk assessment threshold for non-highway facility projects from 10,000 square feet of new impervious surface to one acre.
4. Region Specific Requirements – removed, modified or scaled back requirements for the San Francisco Bay, Los Angeles, Central Valley, Lahontan, and San Diego Regional Water Boards with the goal of maximizing statewide consistency of requirements for the Department.
5. Construction Program – replaced requirement to inspect contractor operations outside the ROW with a requirement to include compliance language in its construction contracts.
6. TMDLs – Revised Attachment IV to more precisely identify the TMDLs applicable to the Department and shifted responsibility to prepare TMDL implementation plans from the Department to the Regional Water Boards.
7. ASBS – Added Attachment III to identify priority Department ASBS outfalls for installation of controls.
8. Maintenance Program.
 - a. Deleted the requirement to report the amount of waste and debris removed from drainage inlets.
 - b. Replaced the site-by-site characterization of waste management sites with a programmatic characterization.
 - c. Deleted the requirement to prepare and implement a storm drain system survey plan.

- d. Replaced quantitative measurements of trash and litter removal with estimated annual volumes.

9. Non-Storm Water.

- a. Deleted surveillance monitoring of agricultural return flows.
- b. Deleted characterization monitoring of slope lateral drains.

Though no firm conclusions or precise estimates can be drawn from this analysis, it is expected that the revisions to the Revised Draft Tentative Order will significantly reduce the cost of compliance.

ATTACHMENT I Incident Report Form

Type of incident: <input type="checkbox"/> Field <input type="checkbox"/> Administrative	
Name of person completing this form: _____	Person's agency name and address: _____
	Person's phone and e-mail: _____

For Field incidents complete Sections 1 and 3. For Administrative incidents complete Section 2. See Non-Compliance Notification Schedule on Page 2.

SECTION 1: Field incidents

Date(s) and time(s) of incident:	1. Start date / time:
	2. End date / time:
Location of Incident: County: _____	3. Nearest city / town:
	4. Street address / nearest cross street:
	5. Latitude / Longitude:
	6. Additional location detail:
Materials involved in the incident: (use Comments Section below if necessary):	6. Name(s) of material(s) discharged:
	7. Approximate quantity discharged (specify units):
	8. Approximate concentration of material:
Discharge to surface water? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, answer questions 9-11	9. Name of waterbody:
	10. Apparent effects (if any) on waterbody:
	11. Estimated extent of impacts to waterbody:
Was CalEMA notified? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, answer questions 12-14	12. Date and time of notification:
	13. Name of person making the notification:
	14. Phone number of person making the notification:
Was the Regional Water Board (RWB) notified? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, answer questions 15-17	15. Name of RWB contact:
	16. RWB contact's phone / e-mail:
	17. Name of person making the notification:
Were downgradient communities / people notified? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, answer questions 18 - 20	18. Date and time of notification:
	19. Name of person making the notification:
	20. Phone number of person making the notification:
	21. Name of downgradient community/ person:

Field Non-Compliance (check all that apply)

	Lack of BMP(s), ineffective implementation of BMP(s), or failure of BMP(s) resulted in a discharge of pollutants to surface water.
	Monitoring data indicates an exceedance of a defined standard. Defined standards include TMDL Waste Load Allocations, and water quality standards in the Water Quality Control Plans and promulgated policies and regulations of the State and Regional Water Boards, including California Ocean Plan limitations and prohibitions.
	Discharge of prohibited non-storm water.
	Failure to comply with Facility Pollution Prevention Plan (FPPP) requirements.
	Failure to comply with inspection, monitoring, and reporting requirements and protocols.
	Other (describe - use Comments Section below if needed):

SECTION 2: Administrative Non-Compliance (check all that apply)

	Failure to submit reports or documents required by the Permit and/or SWMP, failure of timely submittal, and/or failure to submit required information.
	Failure to develop and/or maintain a site-specific FPPP or to implement any other procedural requirement of the Permit.
	Other (describe - use Comments Section below if needed):

SECTION 3: Description of Incident

Activities in the area prior to the incident (If any):
Initial assessment of any impact caused by the discharge (If any):
Samples collected and analyses requested (If any):
Steps taken to mitigate damage and prevent reoccurrence (If any):
Current Status:
Schedule for proposed mitigation/abatement (If any):
Other Comments:

Non-Compliance Notification Schedule

Type of Incident	Within 5 Working Days (Verbal)	Within 10 Working Days (Written)	Within 30 Calendar Days (Written)	In Annual Report
Emergency Incidents ¹	—	—	—	Chronological summary and status of all incidents
Field ²	Notify RWB Executive Officer	To RWB Executive Officer and copies to Dept. HQ	—	Chronological summary and status of all incidents
Administrative ³	Notify RWB Executive Officer or SWB Contact ³	—	To RWB Executive Officer, SWB Executive Director, and copies to Dept. HQ.	Chronological summary and status of all incidents

¹ Sudden, unexpected, unpreventable incidents that threaten public health, public safety, property, or the environment that pose a clear and imminent danger requiring immediate action to prevent or mitigate the damage or threat, and that result in a discharge or potential discharge.

² Failure to meet any non-administrative requirement of the SWMP or Permit or to meet any applicable water quality standard. This includes failure to install required BMPs or conduct required monitoring or maintenance. It also includes discharges or prohibited non-storm water that do not meet the definition of emergency incidents. It does not include determinations by the Department or a Regional Water Board Executive Officer that a discharge is causing or contributing to an exceedance of an applicable WQS. See provision E.2.c.6)c).

³ Failure to meet any administrative or procedural requirement of the SWMP or Permit including submission of required reports, notifications and certifications. The report of non-compliance shall be submitted to the same organization (State or Regional Water Board) to which the required report was originally due.

<i>Certification – I certify that under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.</i>			
Signature of Contractor (if applicable)	Title	Telephone	Date:
Signature of Department Representative	Title	Telephone	Date:

ATTACHMENT II

Monitoring Constituent List

(Not Applicable to ASBS Discharges)

Constituent	Analytical Method	Reporting Limit ³⁵	Units
<i>WATER COLUMN CHEMISTRY</i>			
Conventional Pollutants			
Hardness as CaCO ₃	SM 2340 B or C	5	mg/L
pH	Calibrated Field Instrument		pH Units
Temperature	Calibrated Field Instrument		C +/-
Flow Rate	Calibrated Field Instrument		ft ³ /s
Total Dissolved Solids	EPA 160.1	1	mg/L
Total Suspended Solids	EPA 160.2	1	mg/L
Hydrocarbons			
Oil & Grease	EPA 1664B	1.4	mg/L
Polycyclic Aromatic Hydrocarbons (Total)	EPA 8310	0.05	µg/L
Nutrients			
Total Kjeldahl Nitrogen (TKN)	EPA 351.3	100	µg/L
Nitrate as Nitrogen (NO ₃ -N)	EPA 300.0	100	µg/L
Phosphorous (Total)	EPA 365.2	30	µg/L
Metals			
Aluminum (Total)	EPA 200.8	25	µg/L
Chromium (Total)	EPA 200.8	1	µg/L
Copper (Total)	EPA 200.8	1	µg/L
Iron (Total)	EPA 200.8	1	µg/L
Lead (Total)	EPA 200.8	1	µg/L
Zinc (Total)	EPA 200.8	5	µg/L
Microbiological			
Fecal Coliform	SM 9221 C E	2	MPN/100 mL
Enterococcus ³⁶	EPA 1600	2	CFU/100 mL
<i>WATER COLUMN TOXICITY</i>			
Chronic ³⁷	EPA 821-R-02-013	Pass/Fail	

³⁵ Reporting limits should be sufficient enough to detect the presence of a constituent based on the applicable Regional Water Board Basin Plan. If no limit is specified in the Basin Plan, the reporting limit specified in this table will be used. If no limit is specified in this table, then the Regional Boards shall be consulted.

³⁶ Only applicable for direct discharges to marine waters. See definition of direct discharges and indirect discharges in Attachment VIII (glossary).

³⁷ To calculate either a Pass or Fail of the effluent concentration chronic toxicity test at the IWC, the instructions in Appendix A in the National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document (EPA/833-R-10-003) shall be used.

ATTACHMENT II

ASBS Monitoring

TABLE A
Monitoring Constituent List
(excerpted from California Ocean Plan dated 2009)

Constituent	Units
Grease and Oil	mg/L
Suspended Solids	mg/L
Settleable Solids	mL/L
Turbidity	NTU
PH	

TABLE B
Monitoring Constituent List
(excerpted from California Ocean Plan dated 2009)

Constituent	Units
Arsenic	µg/L
Cadmium	µg/L
Chromium	µg/L
Copper	µg/L
Lead	µg/L
Mercury	µg/L
Nickel	µg/L
Selenium	µg/L
Silver	µg/L
Zinc	µg/L
Cyanide	µg/L
Total Chlorine Residual	µg/L
Ammonia (as N)	µg/L
Acute Toxicity	TUa
Chronic Toxicity	TUc
Phenolic Compounds (non-chlorinated)	µg/L
Chlorinated Phenolics	µg/L
Endosulfan	µg/L
Endrin	µg/L
HCH	µg/L

Analytical Chemistry Methods: All constituents shall be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, shall be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

ATTACHMENT III

ASBS PRIORITY DISCHARGE LOCATIONS

Sample ID	Regional Board	ASBS Name	Longitude	Latitude
SAU020A	1	Saunders Reef	-123.65273	38.85916
SAU019A	1	Saunders Reef	-123.6528	38.86067
SAU016A	1	Saunders Reef	-123.65237	38.85849
SAU015	1	Saunders Reef	-123.65178	38.85612
SAU013A	1	Saunders Reef	-123.6514	38.85451
SAU014	1	Saunders Reef	-123.6517	38.8551
SAU011A	1	Saunders Reef	-123.64853	38.8527
SAU008	1	Saunders Reef	-123.6478	38.8521
SAU006A	1	Saunders Reef	-123.64777	38.85186
SAU009A	1	Saunders Reef	-123.64809	38.85254
RED023	1	Redwoods National Park	-124.1017	41.60527
RED027	1	Redwoods National Park	-124.10126	41.59657
RED028	1	Redwoods National Park	-124.10101	41.59729
RED018A	1	Redwoods National Park	-124.1061	41.613
RED015	1	Redwoods National Park	-124.11257	41.62928
RED014	1	Redwoods National Park	-124.11296	41.63059
RED017A	1	Redwoods National Park	-124.10571	41.61195
FIT012	2	James V. Fitzgerald	-122.516861	37.531406
ANO030	3	Ano Nuevo	-122.30121	37.11334
ANO033	3	Ano Nuevo	-122.29881	37.11202
ANO001	3	Ano Nuevo	-122.306364	37.121672
ANO002	3	Ano Nuevo	-122.30534	37.11987
ANO035	3	Ano Nuevo	-122.29297	37.10714
ALT004	4	Laguna Point to Latigo Point	-119.059097	34.08609
MUG005	4	Laguna Point to Latigo Point	-119.03821	34.083896
ALT005	4	Laguna Point to Latigo Point	-119.054291	34.085415
ALT006	4	Laguna Point to Latigo Point	-119.048653	34.085361
MUG008	4	Laguna Point to Latigo Point	-119.036389	34.083644
MUG010	4	Laguna Point to Latigo Point	-119.014826	34.070804
MUG013	4	Laguna Point to Latigo Point	-118.993551	34.065445
MUG016	4	Laguna Point to Latigo Point	-118.987069	34.062852
ALT008	4	Laguna Point to Latigo Point	-118.985931	34.062325

ATTACHMENT III

Sample ID	Regional Board	ASBS Name	Longitude	Latitude
MUG028	4	Laguna Point to Latigo Point	-118.974165	34.058928
ALT009	4	Laguna Point to Latigo Point	-118.975975	34.059978
MUG031	4	Laguna Point to Latigo Point	-118.968706	34.056265
MUG041	4	Laguna Point to Latigo Point	-118.964271	34.053461
MUG046	4	Laguna Point to Latigo Point	-118.960862	34.052112
MUG048	4	Laguna Point to Latigo Point	-118.9594833	34.05172
MUG049	4	Laguna Point to Latigo Point	-118.9594333	34.05165
MUG051	4	Laguna Point to Latigo Point	-118.957316	34.050937
ALT011	4	Laguna Point to Latigo Point	-118.939404	34.045355
MUG053	4	Laguna Point to Latigo Point	-118.95539	34.050248
MUG059	4	Laguna Point to Latigo Point	-118.9515	34.048835
MUG058	4	Laguna Point to Latigo Point	-118.95042	34.048355
ALT010	4	Laguna Point to Latigo Point	-118.948184	34.047873
MUG061	4	Laguna Point to Latigo Point	-118.94834	34.047675
MUG077	4	Laguna Point to Latigo Point	-118.9345833	34.04513
MUG078	4	Laguna Point to Latigo Point	-118.934358	34.045431
MUG070	4	Laguna Point to Latigo Point	-118.9320000	34.04600
MUG066	4	Laguna Point to Latigo Point	-118.924654	34.04714
MUG073	4	Laguna Point to Latigo Point	-118.922723	34.046418
MUG135	4	Laguna Point to Latigo Point	-118.897426	34.041983
MUG147	4	Laguna Point to Latigo Point	-118.894154	34.041553
MUG150	4	Laguna Point to Latigo Point	-118.889212	34.040872
MUG187	4	Laguna Point to Latigo Point	-118.869505	34.039285
SAD0950	4	Laguna Point to Latigo Point	-118.8385500	34.02699
SAD0960	4	Laguna Point to Latigo Point	-118.8375000	34.02619
SAD0970	4	Laguna Point to Latigo Point	-118.8364600	34.02535
SAD0980	4	Laguna Point to Latigo Point	-118.8348600	34.02435
MUG318	4	Laguna Point to Latigo Point	-118.834316	34.023879
SAD0990	4	Laguna Point to Latigo Point	-118.8326600	34.02302
SAD1000	4	Laguna Point to Latigo Point	-118.8303400	34.02123
MUG355	4	Laguna Point to Latigo Point	-118.829258	34.02122

ATTACHMENT III

Sample ID	Regional Board	ASBS Name	Longitude	Latitude
SAD1030	4	Laguna Point to Latigo Point	-118.827049	34.018711
SAD1040	4	Laguna Point to Latigo Point	-118.8256600	34.01748
SAD1050	4	Laguna Point to Latigo Point	-118.8249200	34.01700
SAD1060	4	Laguna Point to Latigo Point	-118.8225400	34.01559
ALT017	4	Laguna Point to Latigo Point	-118.777059	34.025805
MUG346	4	Laguna Point to Latigo Point	-118.783588	34.02508
MUG283	4	Laguna Point to Latigo Point	-118.765915	34.02589
IRV020	8	Irvine Coast	-117.840190	33.576001
IRV009	8	Irvine Coast	-117.830393	33.566251
IRV007	8	Irvine Coast	-117.828078	33.565343
IRV001	8	Irvine Coast	-117.81858	33.558
IRV002	8	Irvine Coast	-117.821484	33.560705
CAR007B	3	Carmel Bay	-121.923798	36.52499
CAR006	3	Carmel Bay	-121.92457	36.52469

ATTACHMENT IV

Total Maximum Daily Load Requirements

Attachment IV prescribes the implementation requirements for the Total Maximum Daily Loads (TMDLs) in which the Department of Transportation (Department) has been identified as a responsible party. The TMDLs in this attachment have been (1) adopted by the Regional Water Quality Control Boards (Regional Water Boards) and approved by the State Water Resources Control Board (State Water Board) and the Office of Administrative Law or the United States Environmental Protection Agency (U.S. EPA), or (2) established by U.S. EPA.

Section I of this attachment provides directions and general guidance on development of a prioritized list of reaches for implementation actions. Section II identifies the applicable TMDLs and implementation requirements. Section II also contains TMDL-specific permit requirements for the Lake Tahoe Sediment/Nutrients TMDL, Napa River Sediment TMDL, Sonoma Creek Sediment TMDL, and the Lake Elsinore and Canyon Lake Nutrients TMDL. Section III prescribes the general implementation requirements applicable to all TMDLs, and the specific requirements applicable to each pollutant category.

The TMDLs addressed in this attachment were developed by numerous parties over many years, and vary widely in their implementation requirements. As explained in further detail in the Fact Sheet for this Order, Attachment IV establishes consistent implementation requirements among the TMDLs by separating them into one of eight categories by pollutant type, based upon the common treatment and control actions associated with each pollutant type. Each impaired waterbody will be prioritized for implementation by reach, with a fixed number of “compliance units” that must be achieved each year so that all TMDLs are addressed in 20 years. Effectiveness monitoring of the treatment and control actions is required to inform an adaptive management process.

The following eight TMDL pollutant categories have been established for TMDL implementation³⁸:

1. Sediment/Nutrients/Mercury/Siltation/Turbidity
2. Metals/Toxics/Pesticides
3. Trash
4. Bacteria
5. Diazinon
6. Selenium
7. Temperature
8. Chloride

The Department shall comply with the requirements of Attachment IV. These requirements are directly enforceable through Order 2012-0011-DWQ (Order).

³⁸ Some TMDLs containing multiple pollutants have been separated according to the categories that best address the individual pollutants.

ATTACHMENT IV

Section I. TMDL Prioritization and Implementation

A. Reach Prioritization for Pollutant Categories

The Department shall prioritize all TMDLs for implementation of source control measures and best management practices (BMPs). Prioritization shall be consistent with the final TMDL deadlines to the extent feasible. Prioritization shall be conducted separately for each pollutant category and shall be based on an evaluation of each reach of applicable receiving waters within the watershed with a TMDL. The Department shall conduct the prioritization using the following five steps:

1. Complete an inventory of reaches. If reaches are defined in a TMDL, the Department may use that delineation for developing the inventory. If no reaches are specified in the TMDL, the Department shall delineate the receiving water into reaches.
2. Segregate the inventory of reaches according to the pollutant categories listed below in Section III, B through I (Categorical Inventories of Reaches). Individual reaches may be present in multiple pollutant categories.
3. Rank the reaches in each TMDL category in accordance with a procedure similar to that presented in Table IV.1. below.
4. Submit the prioritized Categorical Inventories of Reaches to the State Water Board **by October 1, 2014**, for Regional Water Board and State Water Board consideration. The State Water Board will provide public notice of the submission and the submission will be subject to a 30-day public comment period.
5. The Department shall collaborate with the State Water Board and Regional Water Boards on a final prioritization for each of the Categorical Inventories of Reaches. Factors that may be considered in the final prioritization will include, but not be limited to:
 - a. Opportunities for synergistic benefits with existing or anticipated projects or activities within the reach, e.g., cooperative efforts with other dischargers or projects within an ASBS,
 - b. Multiple TMDLs that can be addressed by a single BMP or a suite of BMPs within a reach,
 - c. TMDL deadlines specified in a Basin Plan,
 - d. Regional Water Board and State Water Board priorities,
 - e. Accessibility for construction and/or maintenance (e.g., safety considerations), and
 - f. Multi-benefit projects that provide benefits in addition to water quality improvement, such as groundwater recharge or habitat enhancement.

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B. Implementation

Following completion of the process described in Section I.A, the State Water Board Executive Director will approve, with any changes, the final prioritized Categorical Inventories of Reaches. The Department shall then select and begin implementation actions, as specified in Sections II and III, within the highest priority reaches to achieve at least the minimum number of compliance units as described below.

1. The Department shall include the following information regarding implementation of control measures in the selected reaches for the upcoming reporting period in the **TMDL STATUS REVIEW REPORT**, as required in Section E.4.b. of the Order:
 - a. Name of the waterbody,
 - b. Associated TMDL(s),
 - c. Proposed control measures,
 - d. Proposed number of compliance units per control measure, and
 - e. Projected schedule for installation of control measures with anticipated beginning and ending dates.

2. The Department shall also include in the **TMDL STATUS REVIEW REPORT**³⁹ a discussion of previous years' activities including:
 - a. The status of implementation activities,
 - b. The location of the control measures,
 - c. The size and type of BMPs that were installed,
 - d. The effectiveness of the BMPs installed, including any pertinent monitoring data (e.g., influent vs. effluent data),
 - e. A summary update of any cooperative implementation agreements (see Attachment IV, section II.B.1), including those that are solely for each TMDL,
 - f. A summary update of activities and/or actions that have been completed for any cooperative implementation agreement for each TMDL,
 - g. A summary update of projects initiated under the cooperative implementation grant program (see Attachment IV, section II.B.2),
 - h. A summary update of activities and/or actions that have been completed for any projects under the cooperative implementation grant program,
 - i. A summary of institutional control measures implemented to comply with Attachment IV,
 - j. A summary of TMDLs adopted during the past year where the Department is assigned a WLA or the Department is identified as a responsible party in the implementation plan,
 - k. A discussion, supported by data and analysis, of whether the Department considers work in the reach complete because it has met WLAs and other TMDL performance criteria, and

³⁹ Per section III.A.3.a of this attachment, by January 1, 2015, the Department shall submit the required information regarding planned implementation of control measures for the first upcoming reporting period (after permit amendment per Order WQ 2014-0077-DWQ) of January 1, 2015 – October 1, 2015.

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- I. Any other information requested by the State Water Board Executive Director or designee.

Control measures and implementation schedules proposed for the upcoming year are subject to the approval of the Executive Director of the State Water Board or designee.

3. Each year the Department shall select and begin implementation activities within the highest priority reaches to achieve a minimum of 1650 compliance units. A compliance unit is defined as one acre of the Department's Right-of-Way (ROW) from which the runoff is retained, treated, and/or otherwise controlled prior to discharge to the relevant reach. Compliance units may be credited to the Department for the following actions:
 - stand-alone BMP retrofits,
 - cooperative implementation,
 - monitoring program-related retrofits,
 - post-construction treatment beyond permit requirements, and
 - other pollution reduction practices necessary to comply with the TMDL.

Compliance units, unless specifically stated below, are credited only when the Department begins implementation of an action listed above.⁴⁰ Once compliance units have been credited for a site, the Department may not receive credit for additional compliance units at that location for additional activities or corrective measures needed to bring the site into compliance. See Section III.A.2. Credit may be received, however, for new activities within the same reach that do not treat the runoff from a site that has already received treatment.

4. The Department may receive credit for compliance units by contributing funds to Cooperative Implementation Agreements and/or the Cooperative Implementation Grant Program (see Section II.B. below). The Department may receive credit for one compliance unit for each \$88,000 that it contributes. For Cooperative Implementation Agreements, the credit will be received when the Department transfers the funds to a responsible party. For the Cooperative Implementation Grant Program, the credit will be received when the Department transfers the funds to the State Water Board.
5. No credit will be given to post-construction BMPs that only meet the minimum requirements of this Order (Section E.2.d.2)a)). Other projects within a TMDL watershed where treatment is provided above and beyond the post-construction requirements in this Order, may receive compliance units according to the following formula:

⁴⁰ For purposes of Section I.B of this attachment, implementation means that a project has entered the Project Initiation Document (PID) phase, the process used by the Department to explain the scope, funding commitment, and approval of a transportation project (<http://www.dot.ca.gov/hq/oppd/pdpm/other/PDPM-Chapters.pdf>).

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$$[(V_t - V_o) / p_{85}] * 12 = \text{acres treated (compliance units calculated to the nearest 0.1)}$$

Where, V_t = Planned volume of runoff to be treated (acre-ft.),

V_o = Volume of runoff from 85th percentile, 24-hour storm event (acre-ft.),

p_{85} = depth of the 85th percentile, 24-hour storm event (inches).

Table IV.1 – Reach Prioritization Scoring Matrix

The rating factors in this table are intended as guidance. Each pollutant category will be ranked separately.

Rating Factor	Criteria		
	<u>High</u>	<u>Medium</u>	<u>Low</u>
Impairment Status: Percent reduction needed	Over 75%	25% - 75%	Below 25%
Department's Drainage Area Contributing to the Reach	Over 5% of drainage area	Between 1% and 5% of drainage area	Less than 1% of drainage area
Proximity to Receiving Waters	Over 75% of ROW within 0.25 miles of reach	Between 25% and 75% of ROW within 0.25 miles of reach	Less than 25% of ROW within 0.25 miles of reach
Community Environmental Health Impact	Top 3 categories	Middle 4 categories	Lower 3 categories

Impairment Status

The degree of impairment of the waterbody, measured by the percent pollution reduction needed to achieve the WLA. Reaches with higher degrees of impairment will be given higher priority. Consider all sources of impairment when making this determination.

Department's Contributing Drainage Area

The contributing drainage area from the Department's ROW is relative to the watershed draining to the reach.

Proximity to Receiving Waters

This rating factor measures the relative proximity of the Department's ROW to the reach of the water that receives runoff from the Department's ROW. Sites discharging through conveyances within 0.25 miles of the pertinent reach are considered to have greater potential to contribute pollutants and receive a higher rating.

Community Environmental Health Impact

This rating factor requires use of the California Office of Health Hazard Assessment (OEHHA) evaluation tool "Enviroscreen" which can be found at <http://oehha.ca.gov/ej/ces11.html>. This tool should be used to assess environmental justice issues. Outcomes are segregated into 10 categories ranging from low to high environmental justice scores. Higher scores indicate that there is a higher potential for environmental justice issues to be present at a site.

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Section II. Applicable TMDLs and Implementation Requirements

A. For each reach for which the Department has committed to begin implementation actions in accordance with Section I of this attachment, the Department shall do one of the following:

1. Implement the requirements in Table IV.2 applicable to that reach ensuring that all BMPs installed meet the minimum requirements specified in the following permit sections:
 - E.2.d.1) (Design Pollution Prevention Best Management Practices),
 - E.2.d.2)b) (Numeric Sizing Criteria for Storm Water Treatment Control BMPs),
 - E.2.e.1) (BMP Development and Implementation, Vector Control),
 - E.2.e.2) (BMP Development and Implementation , Storm Water Treatment BMPs),
 - E.2.e.3) (BMP Development and Implementation, Wildlife), and
 - E.2.e.4) (BMP Development and Implementation, Biodegradable Materials) of this Order.

In addition, the Department shall ensure that all BMPs installed do not cause a decrease in lateral (bank) or vertical (channel bed) stability in receiving stream channels.

2. Demonstrate that it has entered into or intends to enter into a Cooperative Implementation Agreement with other parties having responsibility for the TMDL, as specified below under Cooperative Implementation Agreements.

3. Identify cooperative implementation grants that have been awarded to other parties having responsibility for the TMDL, as specified below under Cooperative Implementation Grant Program.

B. Cooperative Implementation

1. Cooperative Implementation Agreements

- a. The Department is encouraged to establish agreements for cooperative implementation efforts, such as joint implementation actions and/or special implementation studies with other parties that have responsibility for the TMDL, except where precluded by a TMDL or where specific implementation requirements are prescribed in Table IV.2. Cooperative agreements that only involve monitoring are not eligible for compliance units.
- b. Where the Department has existing cooperative implementation agreements with other responsible parties, it shall fulfill the commitments and requirements of those agreements.
- c. Where the Department has not yet committed to cooperative implementation efforts, but intends to do so, the Department must provide written notification,

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including the anticipated date of commitment, to the State Water Board in its **TMDL STATUS REVIEW REPORT**.

- d. Cooperative agreements relative to the TMDL implementation activity are subject to approval by the applicable Regional Water Board Executive Officer. Cooperative agreements shall describe the terms of the mutually agreed activities to be performed, and at a minimum shall include:
 - i. The date the cooperative agreement was approved by the Regional Water Board,
 - ii. A map showing the location of work to be performed in the reach,
 - iii. Any monitoring program parameters and responsibilities,
 - iv. Any implementation responsibilities, including BMP Operation and Maintenance,
 - v. Any funding commitments that correspond with the implementation responsibilities, and
 - vi. A termination clause upon failure to comply with the terms and conditions of the agreement, as applicable.
- e. The Department shall submit sufficient information to document the progress in achieving the requirements of the TMDL for each cooperative implementation agreement in its annual **TMDL STATUS REVIEW REPORT**. (See Section I.B.2.)
- f. If the Department is not participating or has not given notice of its intent to participate in cooperative implementation efforts, or the Department is not fulfilling its cooperative implementation responsibilities under an agreement, it shall immediately comply with applicable TMDL Control Requirements listed in Table IV-2 below and report the corresponding status in the **TMDL STATUS REVIEW REPORT**.

2. Cooperative Implementation Grant Program

- a. The Department may establish a cooperative implementation grant program to be administered by the State Water Board for TMDL watersheds.
- b. If the Department elects to establish a grant program, the Department and State Water Board will prepare an agreement specifying the terms of the grant program and the commitments and responsibilities of the parties. The Department will be responsible for paying the State Water Boards' cost of administering the grant program.
- c. Cooperative implementation grants will be used to fund capital projects undertaken by other responsible parties in impaired watersheds in which the Department has been assigned a WLA or otherwise has responsibility for implementation of the TMDL. Cooperative implementation grant applications that are consistent with the final prioritized Categorical Inventories of Reaches

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(Section I.A.5) will be given a higher priority for funding. Cooperative implementation grants will not be awarded for projects that only involve monitoring, where precluded by a TMDL, or where specific implementation requirements are prescribed in Table IV.2.

C. Consideration for Factors Affecting Implementation

Implementation may require environmental approvals and permitting from local, State, and/or federal resource agencies (e.g., California Coastal Commission, California Department of Fish and Wildlife, U.S. Army Corps of Engineers, local Flood Control agencies, local County, etc.). Other factors such as safety concerns and technical infeasibility may affect project implementation. Delays or cancellations due to environmental or permitting factors beyond the Department's control must be reported in its annual ***TMDL STATUS REVIEW REPORT***.

The State Water Board will revoke compliance units for projects not completed within the implementation schedule approved under Section I.B.1 of this attachment, unless the delay in the implementation schedule is additionally approved by the Executive Director. Partial credit may be allowed if a portion of the project is completed and functioning.

The State Water Board will revoke compliance units for unrecovered grant funds for projects that are not completed under Section II.B.2 of this attachment. Partial credit may be allowed if a portion of the project is completed and functioning. If the grant program is discontinued, any unexpended funds will be returned to the Department and the corresponding compliance units will be revoked.

Compliance units revoked shall be added to the total number of the required compliance units in following years. For example, if a project which claimed 20 compliance units is cancelled, 1670 compliance units (1650 + 20) are required to be implemented in the following year. If the grant program is discontinued, additional time may be allowed for the Department to implement the corresponding compliance units.

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Table IV.2. TMDL Summary Table and Control Requirements

Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
R1 - North Coast Regional Water Board			
Albion River	Sediment	<i>U.S. EPA Established TMDL</i> Effective Date: December 2001 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Big River	Sediment	<i>U.S. EPA Established TMDL</i> Effective Date: December 2001 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Lower Eel River	Temperature and Sediment	<i>U.S. EPA Established TMDL</i> Effective Date: December 18, 2007 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.H.
Middle Fork Eel River	Temperature and Sediment	<i>U.S. EPA Established TMDL</i> Effective Date: December 2003 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.H.
South Fork Eel River	Sediment and Temperature	<i>U.S. EPA Established TMDL</i> Effective Date: December 16, 1999 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.H.
Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury)	Temperature and Sediment	<i>U.S. EPA Established TMDL</i> Effective Date: December 29, 2004 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.H.
Garcia River	Sediment	Effective Date: March 16, 1998 BPA: 4-37.00 Action Plan for the Garcia River Watershed Resolution:	Implement Section III.A. and Section III.B.
Gualala River	Sediment	<i>U.S. EPA Established TMDL</i> Effective Date: November 29, 2004 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Klamath River in California	Temperature, Dissolved Oxygen, Nutrients, and Microcystin	Effective Date: December 28, 2010 BPA: Action Plan for Klamath River TMDLs Resolution: R1-2010-0026	Implement, Section III.A., Section III.B., Section III.H. In addition, the Department shall refer to the Section E.2.d.4) of this Order for locating, assessing, and remediating barriers to fish passage.
Lost River	Nitrogen, Biochemical Oxygen Demand to address Dissolved Oxygen and pH Impairments	Effective Date: December 30, 2008 BPA: Action Plan for Lost River TMDL Resolution: R1-2010-0026	Implement Section III.A. and Section III.B.
Mad River	Sediment and Turbidity	U.S. EPA Established TMDL Effective Date: December 21, 2007 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Navarro River	Sediment and Temperature	U.S. EPA Established TMDL Effective Date: December 27, 2000 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.H.
Noyo River	Sediment	U.S. EPA Established TMDL Effective Date: December 16, 1999 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Redwood Creek	Sediment	U.S. EPA Established TMDL Effective Date: December 30, 1998 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Scott River	Sediment and Temperature	Effective Date: August 11, 2006 BPA: Action Plan for Scott River. Resolutions: R1-2005-0113 & R-2010-0026	Implement Section III.A., Section III.B., and Section III.H.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Shasta River	Dissolved Oxygen and Temperature	Effective Date: January 26, 2007 BPA: Action Plan for the Shasta River Watershed Resolution: R1-2006-0052	Implement Section III.A., Section III.B., and Section III.H.
Ten Mile River	Sediment	U.S. EPA Established TMDL Effective Date: December 2000 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Trinity River	Sediment	U.S. EPA Established TMDL Effective Date: December 20, 2001 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
South Fork Trinity River and Hayfork Creek	Sediment	U.S. EPA Established TMDL Effective Date: December 1998 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Van Duzen River and Yager Creek	Sediment	U.S. EPA Established TMDL Effective Date: December 16, 1999 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
R2 - San Francisco Bay Regional Water Board			
Napa River	Sediment	Effective Date: January 20, 2011 BPA: Chapter 7, Water Quality Attainment Strategies including TMDLs Resolution: R2-2009-0064	Implement Section III.A., Section III.B., and the following: <ul style="list-style-type: none"> • Conduct a survey of stream crossings associated with Department roadways, and develop a prioritized implementation plan and schedule for repair and/or replacement of high priority crossings/culverts. • Submit plan and schedule for conducting stream crossings surveys with

ATTACHMENT IV

Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
			<p>TMDL STATUS REVIEW REPORT in accordance with Section I.B. above.</p> <ul style="list-style-type: none"> • Submit implementation plan and schedule for repair and/or replacement of high priority crossings/culverts with TMDL STATUS REVIEW REPORT in accordance with Section I.B. above.
Richardson Bay	Pathogens	Effective Date: December 18, 2009 BPA: Pathogens in Richardson Bay Resolution: R2-2008-0061	Implement Section III.A. and Section III.E.
San Francisco Bay	PCBs	Effective Date: March 29, 2010 BPA: Exhibit A & TMDL & Implementation Plan for PCBs Resolution: R1-2008-0012	Implement Section III.A. and Section III.C.
San Francisco Bay	Mercury	Effective Date: February 12, 2008 BPA : Chapter 7, SF Bay Mercury TMDL Resolution: R2-2006-0052	Implement Section III.A, Section III.B., and the following: The Department shall work out an equitable mercury WLA scheme in consultation with the San Francisco Bay Area Urban Runoff Management Agencies.
San Pedro and Pacifica State Beach	Bacteria	Effective Date: August 1, 2013 BPA – Chapter 3, Section 3.3.1 Bacteria Resolution: R2-2012-0089	Implement Section III.A. and Section III.E.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
<p align="center">Sonoma Creek</p>	<p align="center">Sediment</p>	<p>Effective Date: September 8, 2010 BPA: Exhibit A & Implementation Plan Resolution: R2-2008-0103</p>	<p>Implement Section III.A., Section III.B, and the following:</p> <ul style="list-style-type: none"> • Conduct a survey of stream crossings associated with Department roadways, and develop a prioritized implementation plan and schedule for repair and/or replacement of high priority crossings/culverts. • Submit plan and schedule for conducting stream crossings surveys with TMDL STATUS REVIEW REPORT in accordance with Section I.B. above. • Submit implementation plan and schedule for repair and/or replacement of high priority crossings/culverts with TMDL STATUS REVIEW REPORT in accordance with Section I.B. above.
<p align="center">San Francisco Bay Urban Creeks</p>	<p align="center">Diazinon & Pesticide-Related Toxicity</p>	<p>Effective Date: May 16, 2007 BPA: Chapter 3, Toxicity Resolution: R2-2005-0063</p>	<p align="center">Implement Section III.A., Section III.C., and Section III.F.</p>

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
R3 - Central Coast Regional Water Board			
San Lorenzo River (includes Carbonera Lompico, and Shingle Mill Creeks)	Sediment	Effective Date: February 19, 2004 BPA: Attachment to R3-2002-0063 Resolution: R3-2002-0063	Implement Section III.A. and Section III.B.
Morro Bay (includes Chorro Creek, Los Osos Creek, and the Morro Bay Estuary)	Sediment	Effective Date: January 20, 2004 BPA: Attachment A to R3-2002-0051 Resolution: R3-2003-0051	Implement Section III.A. and Section III.B.
R4 - Los Angeles Regional Water Board			
Ballona Creek	Metals (Ag, Cd, Cu, Pb, & Zn) and Selenium	Effective Date: December 22, 2005 and reaffirmed on October 29, 2008 BPA: Attachment A, Chapter 7-12 Resolution: R2007-015	Implement Section III.A., Section III.C., and Section III.G.
Ballona Creek	Trash	Effective Date: August 1, 2002 & February 8, 2005 BPA: Attachment A, Chapter 7-3. Resolution: 2004-0023	Implement Section III.A. and Waste Load Allocation requirements and schedule as set forth in the Ballona Creek Trash TMDL.
Ballona Creek Estuary	Toxic Pollutants (Ag, Cd, Cu, Pb, Zn, Chlordane, DDTs, Total PCBs, & Total PAHs)	Effective Date: December 22, 2005 BPA: Attachment A, Chapter 7-14 Resolution: R4-2005-008	Implement Section III.A. and Section III.C.
Ballona Creek, Ballona Estuary, and Sepulveda Channel	Bacteria	Effective Date: March 26, 2007 and November 18, 2013 BPA: Attachment A, Chapter 7-21 Resolution: R4-2006-011	Implement Section III.A. and Section III.E.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Ballona Creek Wetlands	Sediment and Invasive Exotic Vegetation	U.S. EPA Established Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Calleguas Creeks, its Tributaries and Mugu Lagoon	Metals and Selenium	Effective Date: March 26, 2007 BPA: Attachment A, Chapter 7-19 Resolution: R4-2006-012	Implement Section III.A., Section III.C., and Section III.G.
Calleguas Creeks its Tributaries and Mugu Lagoon	Organochlorine Pesticides, Polychlorinated Biphenyls, and Siltation	Effective Date: March 14, 2006 BPA: Attachment A, Chapter 7-17 Resolution: R4-2005-010	Implement Section III.A., Section III.B, and Section III.C.
Colorado Lagoon	Organochlorine Pesticides, PCBs, Sediment Toxicity, PAHs, and Metals (Pb & Zn)	Effective Date: June 14, 2011 BPA: Attachment K, Chapter 7-38 Resolution: R09-005	Implement Section III.A. and Section III.C.
Dominguez Channel & Greater Los Angeles & Long Beach Harbor Waters	Toxic Pollutants: Metals (Cu, Pb, Zn), DDT, PAHs, and PCBs	Effective Date: March 23, 2012 BPA: Attachment A, Chapter 7-40 Resolution: R11-008	Implement Section III.A. and Section III.C.
Legg Lake	Trash	Effective Date: February 27, 2008 BPA: Attachment A, Chapter 7-27 Resolution: R4-2007-10	Implement Section III.A. and Section III.D.
Long Beach City Beaches and Los Angeles River Estuary	Indicator Bacteria	U.S. EPA Established Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A., and Section III.E.
Los Angeles Area (Echo Park Lake)	Nitrogen, Phosphorus, Chlordane, Dieldrin, PCBs, & Trash	U.S. EPA Established Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., Section III.C., and Section III.D.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Los Angeles Area (Lake Sherwood)	Mercury	<i>U.S. EPA Established</i> Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Los Angeles Area (North, Center, & Legg Lakes)	Nitrogen & Phosphorus	<i>U.S. EPA Established</i> Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Los Angeles Area (Peck Road Park Lake)	Nitrogen, Phosphorus, Chlordane, DDT, Dieldrin, PCBs, and Trash	<i>U.S. EPA Established</i> Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., Section III.C, and Section III.D.
Los Angeles Area (Puddingstone Reservoir)	Nitrogen, Phosphorus, Chlordane, DDT, PCBs, Hg, and Dieldrin	<i>U.S. EPA Established</i> Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.C.
Los Angeles River and Tributaries	Metals	Effective Date: December 22, 2005, October 29, 2008, & Reopened and Modified on November 3, 2011 BPA: Attachment A, Chapter 7-13 to 7-13 and Attachment B Resolution: R2007-014 & R10-003	Implement Section III.A. and Section III.C.
Los Angeles River	Trash	Effective Date: December 24, 2008 BPA: Attachment A, Chapter 7-2 Resolution: R4-2007-012	Implement Section III.A. and Waste Load Allocation requirements and schedule as set forth in the Los Angeles River Watershed Trash TMDL.
Los Angeles River Watershed	Bacteria	Effective Date: March 23, 2012 BPA: Attachment A, Chapter 7-39 Resolution: R10- 007	Implement Section III.A and Section III.E.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Los Cerritos	Metals	<i>U.S. EPA Established</i> Effective Date: March 17, 2010 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.C.
Machado Lake	Eutrophic, Algae, Ammonia, and Odors (Nutrients)	Effective Date: March 11, 2009 BPA: Attachment A, to R09-006 Resolution: R08-006	Implement Section III.A. and Section III.B.
Machado Lake	Pesticides and PCBs	Effective Date: March 20, 2012 BPA: Attachment A, Chapter 7-38 Resolution: R10- 008	Implement Section III.A. and Section III.C.
Machado Lake	Trash	Effective Date: February 27, 2008 BPA: Attachment A, Chapter 7-26 Resolution: R4-2007-06	Implement Section III.A. and Section III.D.
Malibu Creek Watershed	Bacteria	Effective Date: January 10, 2006, Revised on November 8, 2013 ** BPA: Attachment A, Chapter 7-10 Resolution: 2004-019R & R12-009	Implement Section III.A. and Section III.E.
Malibu Creek and Lagoon	Sedimentation and Nutrients to address Benthic Community Impairments	<i>U.S. EPA Established TMDL</i> Effective Date: July 2, 2013 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.B.
Malibu Creek Watershed	Trash	Effective Date: June 26, 2009 BPA: Attachment A, Chapter 7-31 Resolution: R4-2008-007	Implement Section III.A. and Section III.D.
Marina del Rey Harbor	Toxic Pollutants (Cu, Pb, Zn, Chlordane, and Total PCBs)	Effective Date: March 16, 2006 BPA: Attachment A, Chapter 7-18 Resolution: R4-2005-012	Implement Section III.A. and Section III.C.
Marina del Rey Harbor Mothers' Beach and Back Basins	Bacteria	Effective Date: March 18, 2004, Revised on November 7, 2013 ** BPA: Attachment A, Chapter 7-5 Resolution: 2003-012, R12-007	Implement Section III.A. and Section III.E.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Revolon Slough and Beardsley Wash	Trash	Effective Date: August 1, 2002 & February 8, 2005 BPA: Attachment A, Chapter 7-3 Resolution: 2004-0023	Implement Section III.A. and Section III.D.
San Gabriel River	Metals (Cu, Pb, Zn) and Selenium	U.S. EPA Established TMDL Effective Date: March 26, 2007 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.C., and Section III.G.
Santa Clara River Estuary and Reaches 3, 5, 6, and 7	Coliform	Effective Date: January 13, 2012 BPA: Attachment A, Chapter 7-36 Resolution: R10-006	Implement Section III.A. and Section III.E.
Santa Clara River Reach 3	Chloride	Effective Date: December 11, 2008 BPA: Attachment B to Resolution No. R4-2008-012 & R4-2008-012	Implement Section III.A. and Section III.I.
Santa Monica Bay Beaches	Bacteria	Effective Date: June 19, 2003, Revised November 7, 2013 ** BPA: Attachment A, Revised in Chapter 7-4 Resolution: 2003-012, R12-007	Implement Section III.A. and Section III.E.
Santa Monica Bay	DDTs and PCBs	U.S. EPA Established TMDL Effective Date: March 26, 2012 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.C.
Santa Monica Bay Nearshore & Offshore	Debris (trash & plastic pellets)	Effective Date: March 20, 2012 BPA: Attachment A, Chapter 7 Resolution:	Implement Section III.A. and Section III.D.
Upper Santa Clara River	Chloride	Effective Date: April 6, 2010 BPA: Attachment B. Chapter 7-6 Resolution: R4-2008-012	Implement Section III.A. and Section III.I.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
Ventura River Estuary	Trash	Effective Date: February 27, 2008 BPA: Attachment A, Chapter 7-25 Resolution: R4-2007-008	Implement Section III.A. and Section III.D.
Ventura River and its Tributaries	Algae, Eutrophic Conditions, and Nutrients	Effective Date: June 28, 2013 BPA: Attachment A, Chapter 7-35 Resolution: R12-011	Implement Section III.A. and Section III.B.
R5 - Central Valley Regional Water Board			
Clear Lake	Nutrients	Effective Date: September 21, 2007 BPA: Attachment 1 to R5-2006-0060 Resolution No.: R5-2006-0060	Implement Section III.A. and Section III.B.
Cache Creek, Bear Creek, Sulphur Creek and Harley Gulch	Mercury	Effective Date: February 7, 2007 BPA: Attachment 1 to R5-2005-0146 Resolution: R5-2005-0146	Implement Section III.A. and Section III.B.
Sacramento-San Joaquin River Delta Estuary	Methyl mercury	Effective Date: October 20, 2011 BPA: Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento – San Joaquin River Delta Estuary Resolution: R5-2010-0043.	Implement Section III.A. and Section III.B.
R6 - Lahontan Regional Water Board			
<p>Lake Tahoe Sediment and Nutrients TMDL Effective Date: August 16, 2011 BPA: WQ Amendment May 2008 Resolution: 2009-0028</p> <p>Lake Tahoe Sediment Requirements A. Pollutant Load Reduction Requirements The Department must reduce fine sediment particle (FSP), total phosphorus (TP), and total nitrogen (TN) loads by 10%, 7%, and 8%, respectively, by September 30, 2016.</p>			

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
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Pollutant load reductions shall be measured in accordance with the processes outlined in the most recent version of Lake Clarity Crediting Program Handbook. To demonstrate compliance with the average annual fine sediment particle pollutant load reduction requirements, the Department must earn and maintain 298 Lake Clarity Credits for the water year October 1, 2015 to September 30, 2016, and for subsequent water years.

B. Pollutant Load Reduction Plans

The Department shall prepare a Pollutant Load Reduction Plan (PLRP) describing how it expects to meet the pollutant load reduction requirements described in Section A above. The Department shall submit a plan no later than July 15, 2014 that shall include, at a minimum, the following elements:

1. *Catchment registration schedule*

The PLRP shall include a list of catchments that the Department plans to register pursuant to the approved Lake Clarity Crediting Program to meet load reduction requirements. The list shall include catchments where capital improvement projects have been constructed since May 1, 2004 that the Department expects to claim credit for, and catchments where projects will be constructed and other load reduction activities (capital improvements, institutional controls, and other measures/practices implement) taken during the term of this Order.

2. *Proposed pollutant control measures*

The PLRP shall generally describe storm water program activities to reduce fine sediment particle, total phosphorus, and total nitrogen loading that the Department will implement in identified catchments.

3. *Pollutant load reduction estimates*

The Department shall conduct pollutant load reduction analyses on a representative catchment subset to demonstrate that proposed implementation actions are expected to achieve the pollutant load reduction requirements specified in Section A. above. For representative catchments, the analysis shall include detailed estimates of both baseline pollutant loading and expected pollutant loading resulting from implementation actions and provide justification why the conducted load reduction analysis is adequate for extrapolation to other catchments.

The pollutant loading estimates shall differentiate between estimates of pollutant load reductions achieved since May 1, 2004 and pollutant load reductions from actions not yet taken.

4. *Load reduction schedule*

The PLRP shall describe a schedule for achieving the pollutant load reduction requirements described in the

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
			<p>Lake Tahoe Sediment TMDL Section A above. The schedule shall include an estimate of expected pollutant load reductions for each year of this Permit term based on preliminary numeric modeling results. The schedule shall also describe which catchments the Department anticipates it will register for each year of this Permit term.</p> <p>5. <i>Annual adaptive management</i> The PLRP shall include a description of the processes and procedures to annually assess storm water management activities and associated load reduction progress. The plan shall describe how the Department will use information from the monitoring and implementation or other efforts to improve operational effectiveness and for achieving the pollutant load reduction requirements specified in Section A.</p> <p>6. <i>Pollutant Load Reduction Plan Update</i> By March 15, 2017, the Department shall update its Pollutant Load Reduction Plan to describe how it will achieve the pollutant load reduction requirements for the second five-year TMDL implementation period, defined as the ten-year load reduction milestone in the Lake Tahoe TMDL. Specifically, the updated Pollutant Load Reduction Plan shall demonstrate how the Department will reduce baseline fine sediment particle, total nitrogen, and total phosphorus loads by 21 percent, 14 percent, and 14 percent, respectively, by water year 2021.</p> <p>C. <i>Pollutant Load Reduction Progress</i> To demonstrate pollutant load reduction progress, the Department shall submit a Progress Report by July 15, 2014 documenting pollutant load reductions accomplished between May 1, 2004 (baseline year) and October 15, 2011.</p> <p>D. <i>Pollutant Load Reduction Monitoring and Water Quality Monitoring Requirements</i> The Department shall prepare and submit a Storm water Monitoring Plan for review and approval by the Regional Water Board by July 15, 2013 and implement the approved plan.</p>
Truckee River	Sediment	Effective Date: September 16, 2009 BPA: WQ Amendment May 2008 Resolution: 2009-0028	Implement Sections III.A. and Section III.B.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
R7 - Colorado River Regional Water Board			
Coachella Valley Storm Water Channel	Bacterial Indicators	Effective Date: April 27, 2012 BPA: Attachment 1: Final CVSC Bacteria TMDL Resolution: R7-2010-0028	Implement Section III.A. and Section III.E.
R8 - Santa Ana Regional Water Board			
Big Bear Lake	Nutrients for Dry Hydrological Conditions	Effective Date: September 25, 2007 BPA: Attachment to R8-2006-0023 Resolutions: R8-2006-0023, and R8-2008-0070	Implement Section III.A. and Section III.B.
<p>Lake Elsinore and Canyon Lake Nutrients TMDL Effective Date: September 30, 2005 BPA: Attachment to R8-2004-0037 & R8-2006-0031 Resolution: R8-2007-0083 Implement Section III.A., Section III.B., and the following:</p> <p>Lake Elsinore/Canyon Lake Nutrient TMDL Joint Responsibility Options</p> <ol style="list-style-type: none"> a. The Department has already committed to cooperative implementation actions, monitoring actions, special studies and implementation actions jointly with other responsible agencies as an active paying member of the Lake Elsinore/Canyon Lake TMDL Task Force. The Department shall continue with those actions and remain an active paying Task Force member. b. If the State Water Board is notified that the Department is not fulfilling its Lake Elsinore/Canyon Lake Task Force obligations or if Department chooses to opt out of the cooperative approach with the TMDL Task Force for implementation actions, monitoring actions, and/or special studies the Department shall make a formal decision six months after the adoption of the Permit Amendment. These decisions must be approved/adopted by the State Board. The Department will then be required to conduct the following activities: <ol style="list-style-type: none"> 1) Within 30 days of such notification, implement a Lake Elsinore and Canyon Lake in-lake monitoring consistent with the TMDL Task Force monitoring program. 2) Within 30 days of such notification, submit a proposed Department facilities monitoring program to evaluate nutrient discharges from the Department's facilities in the Lake Elsinore/Canyon Lake watershed. 			

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
<p>3) Within 30 days of notification, develop and implement a Lake Elsinore in-lake sediment nutrient reduction program to mitigate Department facilities in-lake nutrient sediment load. Develop and implement a monitoring program to evaluate the success of in-lake sediment reduction strategies that will be implemented.</p> <p>4) Within 60 days of notification, develop and implement a Canyon Lake in-lake sediment nutrient reduction program to mitigate Department facilities in-lake nutrient sediment load. Develop and implement a monitoring program to evaluate the success of in-lake sediment reduction strategies that will be implemented.</p> <p>5) Within 60 days of notification, submit an annual monitoring report by August 15th of each year.</p> <p>6) Submit an annual in-lake nutrient reduction program status report by August 15th of each year</p>			
Rhine Channel Area of Lower Newport Bay	Chromium and Mercury	<i>U.S. EPA Established TMDL</i> Effective Date: June 14, 2002 BPA: N/A Resolution: N/A	Implement Section III.A., Section III.B., and Section III.C.
San Diego Creek and Newport Bay, including Rhine Channel	Metals (Copper, Lead, & Zinc)	<i>U.S. EPA Established TMDL</i> Effective Date: June 14, 2002 BPA: N/A Resolution: N/A	Implement Section III.A. and Section III.C.
San Diego Creek and Upper Newport Bay	Cadmium	<i>U.S. EPA Established TMDL</i> Effective Date: June 14, 2002 BPA: N/A	Implement Section III.A. and Section III.C.
San Diego Creek Watershed	Organochlorine Compounds (DDT, Chlordane, PCBs, & Toxaphene)	Effective Date: November 12, 2013 BPA: Attachment 2 Resolution: R8-2011-0037	Implement Section III.A. and Section III.C.
Upper & Lower Newport Bay	Organochlorine Compounds (DDT, Chlordane & PCBs)	Effective Date: November 12, 2013 BPA: Attachment 2 Resolution: R8-2011-0037	Implement Section III.A. and Section III.C.

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Impaired Waterbody	Pollutant(s)	Approved or U.S. EPA Established TMDLs Effective Date Basin Plan Amendment Resolution No.	Implementation Requirements
R9 - San Diego Regional Water Board			
Chollas Creek	Diazinon	Effective Date: November 3, 2003 BPA: Attachment A to Resolution: R9-2002-0123	Implement Section III.A. and Section III.F.
Chollas Creek	Dissolved Copper, Lead and Zinc	Effective Date: December 18, 2008 BPA: Attachment A Resolution: R9-2007-0043	Implement Section III.A and Section III.C.
Rainbow Creek	Total Nitrogen and Total Phosphorus	Effective Date: March 22, 2006 BPA: Attachment A Resolution: R9-2005-0036	Implement Section III.A. and Section III.B.
Project 1- Revised Twenty Beaches & Creeks in the San Diego Region (including Tecolote Creek)	Indicator Bacteria	Effective Date: June 22, 2011 BPA: Attachment A Resolution: R9-2010-001	Implement Section III.A. and Section III.E.
** OAL Approved, U.S. EPA Approval Pending			

Section III. General and Categorical Requirements

A. General Requirements for All TMDLs:

1. Comprehensive TMDL Monitoring Plan

- a. The Department shall continue to implement existing TMDL water quality monitoring plans, including cooperative water quality monitoring plans that the Department is party to that have already received approval from the Regional Water Board Executive Officer.
- b. The Department shall develop and implement a comprehensive TMDL monitoring plan to be submitted to the State Water Board by January 1, 2015. The comprehensive TMDL monitoring plan shall include existing approved water quality monitoring plans as described in Section III.A.1.a. above, and shall also include monitoring for all TMDLs that do not have existing approved

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water quality monitoring plans. The proposed comprehensive TMDL monitoring plan shall be designed to inform selection of BMPs, to inform future reach prioritization submittals, and to assess the effectiveness of BMP implementation. The Department may propose monitoring by pollutant category and may rely on representative monitoring for BMP effectiveness assessment. The comprehensive TMDL monitoring plan shall include a time-schedule for the implementation of the monitoring plan. The comprehensive TMDL monitoring plan is subject to approval by the Executive Director of the State Water Board.

2. Adaptive Management

The Department shall use monitoring data to conduct an on-going assessment of the performance and effectiveness of BMPs. The assessment shall include necessary modifications to control measures to achieve WLAs and other applicable performance standards. Where an assessment indicates that control measures are inadequate to achieve WLAs and other performance standards in a reach, the Department must implement improved control measures/BMPs.

3. Reporting

- a. By January 1, 2015, the Department shall submit the required information in section I.B. of this attachment regarding planned implementation of control measures for the upcoming reporting period (January 1, 2015 – October 1, 2015).
- b. The Department shall summarize the previous year's TMDL monitoring results, deliverables and other actions as specified in its annual **TMDL STATUS REVIEW REPORT**.
- c. The Department shall prepare and submit a **TMDL PROGRESS REPORT** by January 1, 2018, to the State Water Board as part of its report of waste discharge under Provision E.13.c. The **TMDL PROGRESS REPORT** shall be presented to the State Water Board as an informational item and include the following information:
 - i. A summary of the effectiveness of the control measures installed for each reach that has been addressed, as a result of the BMP effectiveness assessment,
 - ii. A determination as to whether the control measures have been or will be sufficient to achieve WLAs and other performance standards by the final compliance deadlines,
 - iii. Where the control measures are determined not to be sufficient to achieve WLAs or other performance standards by the final compliance deadlines, a proposal for improved control measures to address the relevant pollutants,
 - iv. A summary of the estimated quantified amount of pollutants prevented from entering into the receiving waters as a result of BMPs, cooperative agreements, or other source control measures taken, and

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- v. An analysis demonstrating that the level of effort (1650 compliance units/year) during the present permit cycle will be sufficient to achieve WLAs and other performance standards for all TMDLs listed in Table IV.2 by 2034. The analysis must utilize monitoring data if available, pertinent analytical tools, including modeling where appropriate, and provide a reasonable assurance that applicable WLAs and performance criteria will be met.

The **TMDL PROGRESS REPORT** will be subject to public review and comment and will be used in the development of the reissued permit.

B. Sediment/Nutrients/Mercury/Siltation/Turbidity TMDL Control Requirements

Sediment, nutrient and mercury TMDLs identify sediment from roads as a significant or primary source of these pollutants. Measures that control the discharge of sediment can be effective in controlling releases of nutrients and mercury. Therefore, the Department shall implement control measures to prevent or minimize erosion and sediment discharge. This can be achieved by protecting hillsides, intercepting and filtering runoff, avoiding concentrated flows in natural channels and drains, and not modifying natural runoff flow patterns.

C. Metals/Toxics/Pesticides TMDL Control Requirements

1. Fine Particulates

Toxic pollutants and/or heavy metals have a high affinity for adherence to fine sediment, such as particles from tires, brake parts, and the road surfaces. Therefore, the appropriate control measures for metals and toxics are to control erosion and prevent or minimize the discharge of fine sediment. The Department shall implement control measures to prevent the discharge of fine sediment. This can be achieved by intercepting and filtering runoff, avoiding concentrated flows in natural channels and drains, and not modifying runoff flow patterns.

2. Dissolved Fraction Metals

The fraction of metals that are not bound to particulates exists in a dissolved state as free metal ions, as inorganic complexes, or bound to dissolved organic chemicals. Although fine particulate removal also reduces dissolved fraction metals, additional control measures may be necessary for the control of dissolved metals. Typically, treatment for dissolved fraction metals requires physical structures that prevent contaminated runoff from reaching receiving waters, such as infiltration systems that allow runoff water to percolate into soil.

The Department shall propose and implement appropriate control measures to reduce the discharge of dissolved fraction metals to comply with this Order.

3. Pesticides

The Department shall comply with Provision E.2.h.3)b) of this Order which specifies practices for the safe handling and use of pesticides, including

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compliance with federal, State and local regulations, and label directions. This provision also requires site assessments, applicator training, and implementation of integrated pest and vegetation management practices in its vegetation control program.

D. Trash TMDL Control Requirements

Trash in waterbodies reduces habitat for aquatic life, directly impacts wildlife from ingestion or entanglement, impacts human health from pathogens, and impacts the aesthetics of waterbodies.

1. The discharge of trash to receiving waters is prohibited. The Department shall comply with this prohibition in all significant trash generating areas in the watersheds subject to trash TMDL controls, identified as the following:
 - a. Highway on-ramps and off-ramps in high density residential, commercial, and industrial land use areas.
 - b. Rest area and park-and-ride facilities.
 - c. State highways in commercial and industrial land use areas.
 - d. Mainline highway segments identified through pilot studies and/or surveys.
2. The Department shall comply with the discharge prohibition of trash through one of the following control measures:
 - a. Install, operate, and maintain a full capture system, treatment controls, and/or institutional controls for storm drains that service the significant trash generating areas; or
 - b. Coordinate with neighboring municipalities that have jurisdiction over significant trash generating areas and/or priority land use areas (high density residential, industrial, commercial, mixed urban, and public transportation stations) to implement Section III.D.2.a above.
3. The Department shall submit as part of its **TMDL STATUS REVIEW REPORT** a determination of the highway characteristics that may qualify as significant trash generating areas by October 1, 2015, and
4. The Department shall submit as part of its **TMDL STATUS REVIEW REPORT** the status of each of the applicable control measures specified in Section III.D.2 above.

The constituents of Attachment II are not applicable for this pollutant category; therefore the Department is exempted from monitoring for the constituents listed in Attachment II for the waterbodies listed only for trash impairments.

E. Bacteria TMDL Control Requirements

The constituents of Attachment II are not applicable for this pollutant category; therefore the Department is exempted from monitoring for the constituents listed in Attachment II for the waterbodies listed only for bacteria impairments.

1. Dry-Weather Flows

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Dry weather non-storm water discharges may significantly increase bacteria loading to receiving waters. Therefore, the Department shall implement control measures to ensure that the effective prohibition of non-storm water discharges (Provision B.2. of this Order) is implemented according to the prioritized work schedule specified in Section I of this attachment. The prohibition of non-storm water discharges can be achieved through infiltration, diversion, or other methods.

2. Wet-Weather Flows

Wet weather storm water discharges also contribute significant bacteria loads to receiving waters. The principal impact is to the water contact recreation beneficial use (REC-1). The Department shall implement control measures/BMPs to prevent or eliminate the discharge of bacteria from its ROW. Source control and preemptive activities such as street sweeping, clean-up of illegal dumping, public education on littering; and BMPs such as retention/detention, infiltration, diversion of storm water prevent or eliminate the discharge of bacteria to receiving waters.

F. Diazinon TMDL Control Requirements

Diazinon is an organophosphate pesticide used in agriculture. It is no longer registered by the California Department of Pesticide Regulation for non-agricultural uses. The Department does not use diazinon on its ROW. The discharge of diazinon is prohibited.

G. Selenium TMDL Control Requirements

Selenium is naturally occurring in geologic formations, soils and aquatic sediments. Storm water runoff, dewatering, ground water seepage, irrigation of high selenium content soils, and oil refineries are identified as significant sources of selenium. The Department shall implement control measures to control the discharge of selenium, unless the Department can demonstrate one of the following:

1. There is no exceedance of an applicable receiving water limitation for selenium in the receiving water(s) at, or immediately downstream of, the Department's outfall(s), or
2. There is no direct or indirect discharge from the Department's outfall(s) to the receiving water during the time period subject to the WLA.

The Department does not have to comply with the monitoring requirements of Attachment II in demonstrating non-exceedance or no discharge of selenium.

H. Temperature TMDL Control Requirements

Maintenance activities may increase receiving water temperatures as a result of vegetation removal and/or erosion and sedimentation. Sedimentation and erosion control measures for temperature impairments are being required in accordance with Section III.B. Therefore, the Department shall:

1. Preserve existing riparian biotic conditions immediately adjacent to receiving waters susceptible to temperature increases,

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2. Provide effective shade near receiving waters susceptible to temperature increases, and
3. Maintain site potential effective shade near receiving waters susceptible to temperature increases.

Alteration of riparian biotic conditions that may increase sedimentation or reduce effective shade shall receive prior written authorization by the applicable Regional Water Board Executive Officer or designee.

Site-specific Potential Effective Shade is defined as the shade equivalent to that provided by topography and potential vegetation conditions at a site. Effective shade is the percentage of direct beam solar radiation that attenuated and scattered before reaching the ground or stream surface from topographic and vegetation conditions. The term "site-specific potential" is defined as the vegetation conditions possible at a location, considering the vegetation species present, and any natural factors that limit vegetation size and density.

I. Chloride TMDL Control Requirements

Elevated levels of chloride in receiving waters affect their beneficial use for agricultural irrigation. Chloride in the Santa Clara River watershed is principally due to increased salt loadings from imported water and the use of self-regenerating water softeners. The Department does not discharge significant amounts of chloride and any minimal discharges are expected to be addressed under the requirements of this Order. No additional TMDL implementation actions for control of chloride are required in this attachment.

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REGIONAL WATER BOARD SPECIFIC REQUIREMENTS

PART 1 NORTH COAST REGION

1. North Coast Regional Water Board Resolution R1-2004-0087 directs its staff to utilize existing regulatory programs to address sources of sediment within sediment impaired watersheds. The Department owns road right-of-way and other property within watersheds that are listed as impaired for sediment. Some of these facilities have sources of sediment (eroding shoulders, failed culverts, unstabilized cut and fill slopes, etc) that discharge into sediment impaired waterbodies. Consistent with Resolution R1-2004-0087 and the Water Quality Control Plan for the North Coast Region, the Department shall take the following steps in watersheds listed for sediment to identify, prioritize and control sources of sediment that discharge anthropogenic amounts of sediment into impaired waters. These requirements are in addition to any watershed-specific TMDL implementation requirements listed in Attachment IV of this Order. Steps to be taken include:
 - a. Inventory: Identify sources of excess sediment or threatened discharge, and quantify the discharge or threatened discharges from the source(s).
 - b. Prioritize: Prioritize efforts to control discharge of excess sediment based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility. The inventory and prioritized steps shall be completed within two (2) years of the adoption of this Order and updated annually. This step is not required if the Department is implementing the requirements of Attachment IV for sediment TMDLs as the given reaches have already been prioritized within the context of statewide implementation.
 - c. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
 - d. Monitor and Adapt: Use monitoring results to direct adaptive management measures in order to refine and adjust erosion control practices and implementation schedules, until sediment discharge is reduced and no longer causes a violation of any sediment related narrative or numeric objective.

Each District within the North Coast Region shall include a time schedule for the above-referenced activities within the District Workplan for Regional Water Board approval. The time schedule shall implement the required activities as quickly as feasible. An annual update on activities and compliance with the projected time schedule shall be included in each subsequent annual report.

2. Removal of riparian vegetation may result in a threatened discharge or an exceedance of a water quality objective. The North Coast Region has many

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watersheds that are impaired for excess sediment and temperature. Riparian vegetation shall be protected and restored to the greatest extent feasible and removal may require permitting by the Regional Water Board.

PART 2 SAN FRANCISCO BAY REGION

1. High Trash Generation Areas

The Department shall demonstrate compliance with Discharge Prohibition 7, Table 4-1 of the San Francisco Bay Regional Water Board Basin Plan through the timely implementation of control measures in all high trash generating areas in the San Francisco Bay Region, identified as the following:

- a. Freeway on- and off-ramps in high density residential, commercial and industrial land uses.
- b. Rest areas and park-and-rides.
- c. State highways in commercial and industrial land use areas.
- d. Other freeway segments as identified by maintenance staff and/or trash surveys.

2. Control Measures

The Department shall comply with the prohibition of discharge for trash through implementation of the following control measures:

- a. Install, operate, and maintain full trash capture systems, treatment controls, and/or enhanced maintenance controls for storm drains or catchments that service the significant trash generating areas.
- b. Coordinate with neighboring MS4 permittees to construct, operate, and maintain full trash capture systems, treatment controls, and/or enhanced maintenance controls in high trash generating areas and/or priority land use areas (high density residential, industrial, commercial, and public transportation stations).

All installed devices that meet the full trash capture definition (See "Full Capture System", Attachment VIII) may be counted toward this requirement regardless of date of installation.

3. Coordination with Local Entities

The Department may choose to establish a municipal coordination plan to design, build, operate, and/or maintain controls in conjunction with other watershed stakeholders. The Minimum Full Trash Capture requirement may be met with the Department specific activities and devices, or from load reduction resulting from municipal coordination implementation, or any combination thereof, so long as the municipal coordination activities meet the full trash capture standard.

4. Assessment

The Department shall assess the effectiveness of enhanced maintenance controls implemented in high trash generation areas. This assessment will include controls implemented in coordination with local municipalities.

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5. Additional

- a. Abate trash from construction and reconstruction projects.
- b. Include trash capture devices on the outlets of treatment systems for new and redeveloped highway projects to achieve the full trash capture standard.

6. Reporting

In each Annual Report, as part of the **TMDL STATUS REVIEW REPORT**, the Department shall provide a per District summary of the following:

- a. Trash load reduction actions.
- b. Full trash capture installation and maintenance.
- c. Implementation of enhanced maintenance controls.
- d. A map and list of high trash generation areas and the installed controls addressing each area.
- e. The reporting of trash load shall be in a manner approved by the Executive Officer.
- f. Municipal coordination implementation.

7. Storm Water Pump Stations

The Department shall comply with the following implementation measures to reduce polluted water discharges from its pump stations:

- a. Complete an inventory of pump stations within the Department's jurisdiction in the San Francisco Bay Region, including locations and key characteristics⁴¹ and submit to the Regional Water Board by October 1, 2015.
- b. Inspect and collect dissolved oxygen (DO) data from 20 percent of the pump stations once a year (100 percent in five years) after a minimum of a two week antecedent period with no precipitation. DO monitoring is exempted where all discharge from a pump station remains in the storm water collection system or infiltrates into a dry creek immediately downstream.
- c. If DO levels are at or below three milligrams per liter (3 mg/L), apply corrective actions, such as continuous pumping at a low flow rate, aeration, or other appropriate methods to maintain DO concentrations of the discharge above 3 mg/L.
- d. Report inspection and monitoring results in the Annual Report.

⁴¹ Characteristics include name of pump station, latitude and longitude in NAD83, number of pumps, drainage area in acres, dominant land use(s), first receiving water body, maximum pumping capacity of station in gallons per minute (gpm), flow measurement capability (Y or N), flow measurement method, average wet season discharge rate in gpm, dry season discharge (Y, N, or unknown), nearest municipal wastewater treatment plant, wet well storage capacity in gallons, trash control (Y or N), trash control measure, and date built or last updated.

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PART 3 LAHONTAN REGION

The Water Quality Control Plan for the Lahontan Region (Basin Plan) has additional requirements which have been historically applied to the Department's permits and which apply to this NPDES Permit in the Lahontan Region. These requirements include:

1. For projects meeting the criteria specified in Provision E.2.d.of the permit (Project Planning and Design), the following numeric sizing criteria for storm water treatment control BMPs apply:

Where storm water runoff is determined to have connectivity to surface waters and/or is not adequately infiltrated or treated by the natural environment, storm water/urban runoff collection, treatment, and/or infiltration disposal facilities shall be designed, installed, and maintained for the discharge of storm water runoff from all impervious surfaces generated by the 20-year, one-hour design storm (1) within the Truckee River Hydrologic Unit (3/4- inch of rain), (2) within the East Fork Carson River and West Fork Carson River Hydrologic Units (one inch of rain), and (3) within the Mammoth Creek Hydrologic Unit above 7,000-foot elevation (one inch of rain). Hydrologic evaluations may be required or may be conducted consistent with the NEAT study described in item No. 2 below to help determine areas where infiltration of the 20-year, one-hour storm is required.

2. In 2009, the Department completed the Natural Environment as Treatment (NEAT) study and report for 38 miles of roadway within the Lake Tahoe Hydrologic Unit. The NEAT approach is consistent with the strategic approach required by this permit. Projects developed within the NEAT study area shall be designed and constructed based on the priority areas identified by the study.
3. Unless granted a variance by the Lahontan Regional Water Board Executive Officer, there shall be neither removal of vegetation nor disturbance of existing ground surface conditions between October 15 of any year and May 1 of the following year, except when there is an emergency situation that threatens the public health or welfare. This prohibition period applies to the Lake Tahoe, Truckee River, East Fork Carson River, and West Fork Carson River Hydrologic Units and above the 5,000-foot elevation in the portions of Mono and Inyo Counties within the Lahontan Region.
4. Project Review Requirements
 - a. The Department shall participate in early project design consultation for all projects within the Lake Tahoe, Truckee River, East and West Forks Carson River and Mammoth Creek Hydrologic Units.
 - b. The Department must solicit Lahontan Regional Water Board staff review when project development/design is at the 20 to 30 percent design level (prior to Project "Approval" and Environmental Document), 60 percent design level, and 90 percent design level (Plans, "Specifications" and Estimates).

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ATTACHMENT VI — STANDARD PROVISIONS

1. **Duty to Comply.** The Department shall comply with all of the conditions of this Order. Any permit noncompliance constitutes a violation of the CWA and the Porter-Cologne Water Quality Control Act, which may be grounds for enforcement action or denial of permit coverage. [40 C.F.R. § 122.41(a)]

The Department shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. [40 C.F.R. § 122.41(a)(1)]

2. **Modification, Revocation and Reissuance, or Termination.** This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Department for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any General Permit condition.

3. **Enforcement**

- a. The provision contained in this enforcement section shall not act as a limitation on the statutory or regulatory authority of the State and Regional Water Board.
- b. Any violation of the Order constitutes violation of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act, and is the basis for enforcement action, permit termination, permit revocation and reissuance, denial of an application for permit reissuance; or a combination thereof.
- c. The State and Regional Water Boards may impose administrative civil liability may refer a discharger to the State Attorney General to seek civil monetary penalties, may seek injunctive relief or take other appropriate enforcement action as provided in the California Water Code or federal law.
- d. All applications, reports, or information submitted to the State Water Board or Regional Water Boards shall be signed and certified. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Order including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both. [40 C.F.R. § 122.41(k)]

4. **Need to Halt or Reduce Activity not a Defense.** It shall not be a defense for the Department in an enforcement action that it would have been necessary to halt or

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reduce the permitted activity in order to maintain compliance with the conditions of this Order. [40 C.F.R. § 122.41(c)]

5. **Duty to Mitigate.** The Department shall take all reasonable steps to minimize or prevent any discharge in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. [40 C.F.R. § 122.41(d)]
6. **Proper Operation and Maintenance.** The Department at all times shall properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Department to achieve compliance with the conditions of this Order. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems installed by the Department only when necessary to achieve compliance with the conditions of this Order. [40 C.F.R. § 122.41(e)]
7. **Property Rights.** This Order does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State, or local laws or regulations. [40 C.F.R. § 122.41(g)]
8. **Duty to Provide Information.** Within a reasonable time specified by the State Water Board, Regional Water Boards, or U.S. EPA, the Department shall furnish records, reports, or information required to be kept by this Order, and shall furnish any information requested to determine whether cause exists for modifying, revoking, and reissuing, or terminating this Order or to determine compliance with this Order. [40 C.F.R. § 122.41(h)]
9. **Inspection and Entry.** [40 C.F.R. § 122.41(i)] Upon the presentation of credentials and other documents as may be required by law, the Department shall allow the State and Regional Water Boards, or U.S. EPA to:
 - a. Enter upon the Department's premises where a regulated facility or activity is located or conducted or where records are required to be kept under the conditions of this Order;
 - b. Have access to and copy at reasonable times any records that must be kept under the conditions of this Order;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
 - d. Sample or monitor at reasonable times for the purposes of assuring ensuring permit compliance, or as otherwise authorized by the Clean Water Act.

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10. **Monitoring and Records.** [40 C.F.R. § 122.41(j)]
- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
 - b. The Department shall retain records of all monitoring information for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the State Water Board's Executive Director or Regional Water Board's Executive Officer at any time.
 - c. Records of monitoring information shall include:
 - i. The date, exact place, and time of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;
 - iv. The individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and
 - vi. The results of such analyses.
 - d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. subchapters N or O.
 - e. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or both.
11. **Signatory Requirements.** All reports, certifications, and records required by this Order or requested by the State Water Board and Regional Water Boards or U.S. EPA shall be signed by either a principal executive officer or by a duly authorized representative. A person is a duly authorized representative only if [40 C.F.R. §§ 122.22 & 122.41(k)]:
- a. The authorization is made in writing by the principal executive officer; and
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the Department. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

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If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, the Department shall provide a new authorization prior to submittal of any reports, certifications, or records signed by the newly authorized representative.

12. **Certification.** Any person signing documents under Provision 11 above shall make the following certification [40 C.F.R. § 122.22(d)]:

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

13. **Reporting Requirements.**

- a. *Planned changes.* The Department shall give advance notice to the State Water Board and the appropriate Regional Water Board of any planned physical alteration or additions to the permitted facility. Notice is required under this provision only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged; [40 C.F.R. § 122.41(l)(1)]
- b. *Anticipated noncompliance.* The Department shall give advance notice to the appropriate Regional Water Board of any planned changes at the permitted facility or activity which may result in noncompliance with Permit requirements; [40 C.F.R. § 122.41(l)(2)]
- c. *Compliance Schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order shall be submitted no later than 14 days following each scheduled date; [40 C.F.R. § 122.41(l)(5)]
- d. *Other Information.* Where the Department becomes aware that it failed to submit any relevant facts, or submitted incorrect information in a permit application or in any required report, it shall promptly submit such facts or information [40 C.F.R. § 122.41(l)(8)].
- e. The Department shall submit, except for the Annual Report, one copy of each report required by the permit to the State Water Board. The Department shall also submit one copy to each of the appropriate Regional Water Boards. The Department may choose to submit its properly signed reports electronically

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into SMARTS in the Portable Document Format (PDF) and submit hard copies only upon request of the State or Regional Water Board staff.

14. **Oil and Hazardous Substance Liability.** Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Department from any responsibilities, liabilities, or penalties to which the Department is or may be subject to under Section 311 of the CWA.
15. **Severability.** The provisions of this Order are severable; and if any provision of this Order or the application of any provision of this Order to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.
16. **Availability.** A copy of this Order shall be maintained at the facility and be available at all times to the appropriate facility personnel and to representatives of the Regional Water Boards, State Water Board, or U.S. EPA.
17. **Education.** The Department shall ensure that all personnel whose decisions or activities could affect storm water quality are familiar with the requirements of this NPDES Permit.

ATTACHMENT VII

ATTACHMENT VII — LIST OF ACRONYMS & ABBREVIATIONS

ASBS	Areas of Special Biological Significance
BAT	Best Available Technology Economically Achievable
Basin Plans	Regional Water Quality Control Plans
BCT	Best Conventional Pollutant Control Technology
BMPs	Best Management Practices
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	Construction General Permit - NPDES General Permit for Storm Water Discharges Associated with Construction Activities
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
Department	California Department of Transportation (Caltrans)
EC	Electrical Conductivity
EMA	Emergency Management Agency
ESA	Environmentally Sensitive Area
FPPP	Facility Pollution Prevention Plan
GPS	Global Positioning System
Hydromodification	Hydrograph Modification
IC/ID	Illegal Connection/ Illicit Discharge
IGP	Industrial General Permit - NPDES General Permit for Discharges Associated with Industrial Activities Excluding Construction Activities
LA	Load Allocation
LID	Low Impact Development
MEP	Maximum Extent Practicable
MRP	Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
NCIR	Non-Compliance Incident Report
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
Ocean Plan	California Ocean Plan
PAHs	Polycyclic Aromatic Hydrocarbons
POTW	Publicly Owned Treatment Works
Regional Water Board	Regional Water Quality Control Board
ROW	Department Right-of-Way
State Water Board	State Water Resources Control Board
SUSMP	Standard Urban Storm Water Mitigation Plan
SWAMP	Surface Water Ambient Monitoring Program
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TCGP	Tahoe Construction General Permit
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TPH	Total Petroleum Hydrocarbon
TSS	Total Suspended Solids
U.S. EPA	United States Environmental Protection Agency
WDRs	Waste Discharge Requirements
WLA	Waste Load Allocation
WQBEL	Water Quality-Based Effluent Limitation
WQO	Water Quality Objective
WQS	Water Quality Standard
Workplans	District Workplans

ATTACHMENT VIII

ATTACHMENT VIII - GLOSSARY

Acute Toxicity. A chemical stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute. When expressed as toxic units acute (TUa), $TUa = 100/96\text{-hour LC } 50 \text{ percent}$. Acute toxicity can also be expressed as lethal concentration 50 percent (LC 50).

Administrative Noncompliance. Failure to comply with the procedural requirements of this Order. Examples include but are not limited to: failure to submit required reports or documents required by the Permit and/or SWMP, missed deadlines or late submittal, and/or failure to submit required information, failure to develop and/or maintain site-specific FPPP or to implement any other procedural requirement of the Permit.

Areas of Special Biological Significance (ASBS). Ocean or estuarine areas designated by the State Water Board that require special protection of species or biological communities to the extent where alteration of natural water quality is undesirable. The California Ocean Plan describes ASBSs as "those areas containing biological communities of such extraordinary value that no risk of change in their environment as the result of man's activities can be entertained". ASBSs are a subset of State Water Quality Protection Areas.

Basin Plans. Basin Plans (regional water quality control plans) are the principal regulatory mechanisms for protection of water quality in California. Basin plans describe the beneficial uses that each water body supports, e.g. drinking, swimming, fishing, and agricultural irrigation; the water quality objectives necessary to protect those uses; and the program implementation needed to achieve the objectives, such as waste discharge permits and enforcement actions.

Batch Plant. A processing plant where concrete or asphalt is mixed before transport to a construction site. Batch plants are considered to be industrial activities as defined in 40 CFR 122.26(b)(14) (iii) and are regulated under the Industrial General Permit.

Beneficial Uses. The uses of the water protected against degradation including, but not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT). Technology-based compliance standard established by the Clean Water Act. BAT is based on consideration of the age of the equipment and facilities involved, the processes employed, the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements) and other factors as deemed appropriate. BAT effluent

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limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT). Technology-based compliance standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. BCT is established by a two-part “cost reasonableness” test, which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BCT. Limits must be reasonable under both tests.

Best Management Practices (BMPs). Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of “waters of the United States.” BMPs include structural and nonstructural controls, treatment requirements, operation and maintenance procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Non-Approved BMP. Any BMP for maintenance, construction, design pollution prevention, and treatment that are not in the Department’s SWMP (CTSW-RT-02-008) or Statewide Storm Water Quality Practice Guidelines (CTSW-RT-02-009) approved for statewide use.

Post-Construction BMPs. Any structural or non-structural controls that detain, retain, or filter storm water to prevent the release of pollutants to receiving waters after final site stabilization is attained.

Structural BMPs. Any structural facility designed and constructed to mitigate the adverse impacts of storm water runoff (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

Source Control BMPs. Any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source. Examples include treatment techniques that use natural measures to reduce pollution levels, do not require extensive construction efforts, and/or promote pollutant reduction by controlling the pollutant source.

Treatment Control BMPs. Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

California Ocean Plan (Ocean Plan). The water quality control plan for California near-coastal waters, first adopted by the State Water Resources Control Board in 1972.

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The purpose of the Ocean Plan is to protect the beneficial uses of the State's ocean waters by identifying water quality objectives, setting general waste discharge requirements, and listing discharge prohibitions. In addition, the Ocean Plan is used to develop and update statewide water quality control plans, policies, and standards involving marine waters.

California Toxics Rule. The Federal regulation, found at 40 CFR § 131.38. Establishes water quality criteria (limits) for heavy metals and other toxic compounds for the protection of beneficial uses of surface waters in California.

Catch Basins. A storm drain inlet having a sump below the outlet to capture settled solids, debris, sediment, and prevent clogging.

Chronic Toxicity. The ability of a substance or a mixture of substances to cause harmful effects over an extended period of time. Expressed as toxic units chronic (TUc), $TUc = 100/NOEL$, where NOEL is the No Observed Effect Level.

Construction Activity. Any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in a land disturbance. Construction does not include emergency construction activities required to immediately protect public health and safety or routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Cut and Fill. The process of moving earth by excavating part of an area and using the excavated material for adjacent embankment of fill areas.

Department Airspaces. Any area within the Department's operating right-of-way that can safely accommodate a privately managed use such as: parking lots, self storage units, commercial businesses, light industry, and cellular telephone towers. The Department executes airspace leases with third parties for these uses.

Department Facility. A Maintenance Facility, Non-maintenance Facility, Highway Facility, Industrial Facility, or Vehicle Maintenance.

Maintenance Facility. A facility under Department ownership or control that contains fueling areas, maintenance stations/yards, waste storage or disposal facilities, wash racks, equipment or vehicle storage and materials storage areas.

Non-maintenance Facility. Laboratories or office buildings used exclusively for administrative functions.

Highway Facility. Highways are linear facilities designed to carry vehicular and pedestrian traffic. These include freeways, highways, and expressways as designated by the California Streets and Highway Code and the California legislature. These facilities also include all support infrastructure associated with these freeways, including bridges, toll plazas, inspection and weigh stations, sound walls, retaining

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walls, culverts, vegetated slopes, shoulders, intersections, off ramps, on ramps, over passes, lights, signal lights, gutter, guard rail, and other support

facilities. The support infrastructure is considered a Highway Facility only when accompanied by an increase in highway impervious surface. Otherwise, it is considered a non-highway .

Industrial Facility. A collection of industrial processes discharging storm water associated with industrial activity within the property boundary or operational unit.

Non-Highway Facility. For purposes of this permit, a Non-Highway Facility is any facility not meeting the definition of a Highway Facility, including but not limited to rest stops, park and ride facilities, maintenance stations, vista points, warehouses, laboratories, and office buildings.

Discharge. When used without qualification means the discharge of a pollutant.

Direct Discharge. Any discharge from the MS4 that does not meet the definition of an indirect discharge.

Indirect Discharge. Any discharge from the MS4 that is conveyed to the receiving water through 300 feet or more of an unlined ditch or channel as measured between the discharge point from the MS4 and the receiving water.

Discharge of a Pollutant. The addition of any pollutant or combination of pollutants to waters of the United States from any point source, or any addition of any pollutant or combination of pollutants to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. The term includes additions of pollutants to waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

District Workplans (DWPs). Annual workplans prepared by each District containing descriptions of all activities and projects to be undertaken in the District that are necessary to implement the SWMP and comply with the requirements of this Order. DWPs are submitted annually with the Annual Report. Formerly known as the Regional Work Plans.

Drainage Inlet. A location where water runoff enters a storm water drainage system that includes streets, gutters, conduits, natural or artificial drains, channels and watercourses, or other facilities that are owned, operated, maintained and used for the purpose of collecting, storing, transporting or disposing of storm water

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Effluent. Any discharge from the MS4.

Emergency. Any sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency" includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage.

Erosion. The diminishing or wearing away of land due to wind, or water. Often the eroded material (silt or sediment) becomes a pollutant via stormwater runoff.

Erosion occurs naturally, but can be intensified by land disturbing and grading activities such as farming, development, road building, and timber harvesting.

Facility Pollution Prevention Plan (FPPP). A plan that identifies the functional activities specific to the maintenance facility and the applicable BMPs and other procedures utilized by facility personnel to control the discharge of pollutants in storm water. Facilities subject to FPPPs include: maintenance yards/stations; material storage facilities/permanent stockpile locations (if not totally enclosed); equipment storage and repair facilities, roadside rest areas, agricultural and highway patrol weigh stations, decant storage or disposal locations, and permanent and temporary solid and liquid waste management sites.

FPPPs are not required for temporary stockpile locations (in continuous use for less than one year). All temporary stockpile locations shall implement the applicable best management practices defined in the Caltrans Stormwater Quality Handbook Maintenance Staff guide. Any stockpile location in continuous use for more than one year is deemed permanent and requires a Facility Pollution Prevention Plan.

Full Capture System. A full capture system is any single device or series of devices that traps all particles retained by a five (5) mm mesh screen and has a design treatment capacity of not less than the peak flow rate Q resulting from a one-year, one-hour, storm in the subdrainage area.

Rational equation is used to compute the peak flow rate: $Q = C \times I \times A$

Where Q = design flow rate (cubic feet per second, cfs);

C = runoff coefficient (dimensionless);

I = design rainfall intensity (inches per hour, as determined per a rainfall isohyetal map), and

A = subdrainage area (acres).

Hydrograph Modification (Hydromodification). The alteration of the hydrologic characteristics of surface waters through watershed development. Under past practices, new and re-development construction activities resulted in urbanization, which in turn modified natural watershed and stream processes. The impacts of hydromodification include, but are not limited to, increased bed and bank erosion,

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loss of habitat, increased sediment transport and deposition, and increased flooding. Urbanization does this by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, and altering the condition of stream channels through straightening, deepening, and armoring. These changes affect hydrologic characteristics in the watershed and affect the supply and transport of sediment in the stream system.

Hydromodification Management Plan. A plan to control and reduce the impacts of hydrograph modification from development activities in a watershed.

Illegal Connection/Illicit Discharge (IC/ID).

Illegal Connection. An engineered conveyance that is connected to an MS4 without authorization by local, state, or federal statutes, ordinances, codes, or regulations.

Illicit Discharge. Any discharge to an MS4 that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. It includes all non-storm water discharges except conditionally exempt non-storm water discharges.

Illegal Dumping. Discarding or disposal within the Department's right-of-way, properties or facilities, either intentionally or unintentionally, of trash and other wastes in non-designated areas that may contribute to storm water pollution.

Impervious Cover. Any surface in the landscape that cannot effectively absorb or infiltrate rainfall; for example, sidewalks, rooftops, roads, and parking lots.

Incidental Runoff. Unintended small amounts (volume) of runoff from landscape irrigation, such as minimal over-spray from sprinklers that escapes the irrigated area. Water leaving an irrigated area is not considered incidental if it is due to improper (e.g. during a precipitation event) or excessive application, if it is due to intentional overflow or application, or if it is due to negligence. Leaks and other discharges (e.g. broken sprinkler heads) are not considered incidental if not corrected within 72 hours of learning of the discharge or if the discharge exceeds 1000 gallons.

Land Use. How land is managed or used by humans (e.g., residential and industrial development, roads, mining, timber harvesting, agriculture, grazing, etc.). Land use is generally regulated at the local level in the U.S. based on zoning and other regulations. Land use mapping differs from land cover mapping in that it is not always obvious what the land use is from visual inspection.

Load Allocation. The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which can range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading (40 CFR 130.2(g)).

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Low Impact Development (LID). An approach to land development with the goal of mimicking or replicating the pre-project hydrologic regime through the use of design techniques to create a functionally equivalent hydrologic site design. Hydrologic functions of storage, infiltration and ground water recharge, as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale storm water retention and detention areas, reduction of impervious surfaces, and the lengthening of runoff flow paths and flow time. Other strategies include the preservation/protection of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, mature trees, flood plains, woodlands, and highly permeable soils.

Maximum Extent Practicable (MEP). The minimum required performance standard for implementation of municipal storm water management programs to reduce pollutants in storm water. Clean Water Act § 402(p)(3)(B)(iii) requires that municipal permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is the cumulative effect of implementing, evaluating, and making corresponding changes to a variety of technically appropriate and economically feasible BMPs, ensuring that the most appropriate controls are implemented in the most effective manner. To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible and are not cost-prohibitive. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the costs would be prohibitive. A final determination of whether a municipality has reduced pollutants to the MEP can only be made by the State or Regional Water Boards.

Municipal Separate Storm Sewer System (MS4). A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is: (1) Owned or operated by a state, city, town, village, or other public entity that discharges to waters of the U.S.; (2) Designed or used to collect or convey storm water; (3) Not a combined sewer; and (4) Not part of a Publicly Owned Treatment Works.

Natural Ocean Water Quality. The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, i.e., an absence of significant amounts of: (a) man-made constituents (e.g., DDT); (b) other chemical (e.g., trace metals), physical (temperature/thermal pollution, sediment burial), and biological (e.g., bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (e.g., invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "shall not alter natural ocean water quality" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional

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monitoring program(s). If monitoring information indicates that natural ocean water quality is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

New Development. Any newly constructed facility, street, road, highway or contiguous road surface installed as part of a street, road or highway project within the Department's right-of-way.

Non-Department Activities. Third party activities that are primarily controlled by encroachment permits, leases, and rental agreements. They include both construction activities and non-construction activities.

Non-Department Projects. Same as Non-Department Activities.

Non-storm Water. Discharges that are not induced by precipitation events and are not composed entirely of storm water. These discharges include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, concrete washout water, paint wash water, irrigation water, pipe testing water, lawn watering overspray, hydrant flushing, and fire fighting activities.

Nonpoint Source. Pollution that is not released through a discrete conveyance but rather originates from multiple sources over a relatively large area. Nonpoint sources can be divided into source activities related to either land or water use, including failing septic tanks, animal agriculture, forest practices, and urban and rural runoff.

Nuisance. Anything that meets all of the following requirements: (1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; (3) occurs during, or as a result of, the treatment or disposal of wastes.

Perennial Stream. Any stream shown as a solid blue line on the latest version of the U.S. Geological Survey (USGS) 7.5 minute series quadrangle map (sometimes referred to as a blue-line stream). Where 7.5 minute series maps have not been prepared by USGS, 15 minute series maps are used.

Pesticide. Substances intended to repel, kill, or control any species designated a "pest" including weeds, insects, rodents, fungi, bacteria, or other organisms. The family of pesticides includes [herbicides](#), [insecticides](#), [rodenticides](#), [fungicides](#), algicides, and [bactericides](#).

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Algicide. A pesticide that controls algae in swimming pools and water tanks.

Herbicide. A pesticide designed to control or kill plants, weeds, or grasses.

Insecticide. A pesticide compound specifically used to kill or prevent the growth of insects.

Rodenticide. A pesticide or other agent used to kill rats and other rodents or to prevent them from damaging food, crops, or forage.

Fungicide. A pesticide used to control or destroy fungi on food or grain crops.

Bactericide. A pesticide used to control or destroy bacteria, typically in the home, schools, or on hospital equipment.

pH. A measure of the degree of acidity or alkalinity in a water sample. The pH of natural waters tends to range between six (6) and nine (9), with neutral being seven (7). Extremes of pH can have deleterious effects on aquatic systems.

Point source. Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged.

Pollutant. Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq.*)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

Pollutants of Concern. Pollutants in a discharge with potential to cause a condition of pollution or nuisance due to the discharge of excessive amounts, proximity to receiving waters, or the properties of the pollutant. Pollutants that impair waterbodies listed under CWA section 303(d) are also Pollutants of Concern. Pollutants in the Department's discharge that may be Pollutants of Concern include, but are not limited to, total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (e.g., decaying vegetation and animal waste), and litter and trash.

Pollution. An alteration of the quality of the waters of the state by waste to a degree which unreasonably affects the beneficial uses of the water or facilities which serve those beneficial uses (Porter-Cologne Water Quality Control Act, section 13050(l)(1)).

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Redevelopment. The creation, addition, and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that removes impervious materials and exposes the underlying soil or pervious subgrade. Redevelopment does not include trenching and resurfacing associated with utility work; pavement grinding and resurfacing of existing roadways; construction of new sidewalks, pedestrian ramps, or bike lanes on existing roadways; or routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway. Redevelopment does include replacement of existing roadway surfaces where the underlying soil or pervious subgrade is exposed during construction. Replaced impervious surfaces of this type shall be considered "new impervious surfaces" for purposes of determining the applicability of post-construction treatment controls as provided in provision E.2.d.2).

Roadway. Any road within the Department's right-of-way.

Routine Maintenance. Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility. Routine maintenance does not include replacement of existing roadway surfaces where the underlying soil or pervious subgrade is exposed.

Right-of-Way (ROW). Real property that is either owned or controlled by the Department or subject to a property right of the Department. Right-of-way that is in current use is referred to as operating ROW.

Sediment. Soil, sand, and minerals washed from land into water, usually after rain.

Slope Lateral Drainage. Horizontal drains placed in hillside embankments to intercept groundwater and direct it away from slopes to provide stability.

Spill. The sudden release of a potential pollutant to the environment.

Storm Water. Storm water runoff, snowmelt runoff, and surface runoff and drainage, as defined in 40 CFR 122.26 (b)(13).

Storm Water Runoff. The portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels or pipes.

Standard Urban Storm Water Mitigation Plan (SUSMP). Plans designating the Best Management Practices that must be used in specified categories of development and redevelopment. The State Water Board adopted a precedential decision (Order WQ 2000-11) upholding a SUSMP requirement imposed under a Phase I MS4 permit and requiring SUSMPs in all MS4 permits.

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Storm Water Management Plan (SWMP). Description of the procedures and practices used to reduce or eliminate the discharge of pollutants to storm drain systems and receiving waters.

Surface Water Ambient Monitoring Program (SWAMP). The State Water Board's monitoring, assessment, and reporting program for ambient surface water.

Threshold Drainage Area (TDA). The area draining to a location 20 channel widths downstream (representative reach) of a stream crossing (pipe, swale, culvert, or bridge) within Project Limits.

Threatened Non-compliance. Any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

Total Dissolved Solids (TDS). A quantitative measure of the residual minerals dissolved in water that remain after evaporation of a solution and used to evaluate the quality of freshwater systems.

Total Kjeldahl Nitrogen (TKN). The sum of organic nitrogen and total ammonia nitrogen.

Total Maximum Daily Load (TMDL). The sum of the individual WLAs for point sources and LAs for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If Best Management Practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs (40 CFR 130.2(i)).

Total Petroleum Hydrocarbon (TPH). A measure of the concentration or mass of petroleum hydrocarbons in a given amount of soil or water. TPH is a mixture of different compounds from different sources.

Total Suspended Solids (TSS). Suspended particulate matter: Fine material or soil particles that remain suspended by the water column. They create turbidity and, when deposited, can smother fish eggs or alevins.

Toxicity. The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Trash. All improperly discarded waste material associated with human habitation, of human origin; or from any producing, manufacturing, or processing operation including, but not limited to, product packaging or containers constructed of steel,

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aluminum, glass, paper, plastic, and other natural and synthetic materials that are thrown or deposited in waters or where it could be transported, as floating, suspended, and/or settleable materials, to waters of the State, including watersheds. (SWRCB Trash Policy).

Turbidity. Murkiness or cloudiness of water, indicating the presence of suspended solids.

United States Environmental Protection Agency (U.S. EPA). U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by the United States Congress. U.S. EPA is responsible for researching and setting national standards for the Storm Water Program.

Waste. Includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

Wasteload Allocation (WLA). The portion of a receiving water's total maximum daily load that is allocated to one of its existing or future point sources of pollution. Waste load allocations constitute a type of water quality-based effluent limitation.

Water Quality Objectives (WQO). The limits or levels of water quality elements or biological characteristics established to reasonably protect the beneficial uses of water or to prevent nuisance within a specific area. Water quality objectives may be numeric or narrative.

Water Quality Standards (WQS). State-adopted and U.S. EPA-approved water quality standards for surface water bodies. The standards prescribe the beneficial uses (swimmable, fishable, drinkable, etc.) of the water body and establish the WQOs that must be met to protect designated uses.

Waters of the State. Any surface water or groundwater, including saline waters, within boundaries of the state, as defined in CWC 13050(e). This Order contains requirements to protect the beneficial uses of waters of the State.

Waters of the United States. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the United States [as defined in 40 CFR 230.3(s)] include all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use of which would affect or could affect interstate or foreign commerce. The definition also applies to tributaries of the aforementioned waters. See 40 CFR 122.2 for the complete definition, which is hereby incorporated by reference.

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Watershed. A drainage area or basin in which all water drains or flows toward a central collector such as a stream, river, or lake at a lower elevation.

Wetlands. Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Workplans. See District Workplans.

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Attachment IX: Reporting Requirements

Reporting Requirement	Permit Section	Due Date	Frequency
Annual Report	E.3.	October 1, 2013	Annually
Draft ASBS Compliance Plan	E.5.c.2)	September 20, 2013	18 months after the General Exception effective date
Final ASBS Compliance Plan	E.5.c.2)	September 20, 2015	30 months after the General Exception effective date
Budget Analysis	E.2.b.3)c)	October 1, 2017	Year 4 of Permit Cycle
Certification of the Adequacy of Legal Authority	E.2.b.2)b)	October 1, 2013	Annually as part of the Annual Report
District Workplans	E.3.b.	October 1, 2013	Annually as part of the Annual Report
Facility Pollution Prevention Plan (FPPP)	E.2.h.2)	October 1, 2013	Annually as part of the Annual Report and as required by the Regional Water Board
Fiscal Analysis	E.2.b.3)b)	October 1, 2013	Annually as part of the Annual Report
IC/ID & Illegal Dumping Response Plan	E.2.h.4)b)ii)	December 31, 2013	Update as needed annually
Incident Report Form	E.2.b.6)and Attachment I	October 1, 2013	As Needed
Landslide Management Plan	E.2.h.3)d)	October 1, 2013	Year 1 Annual Report
Monitoring Results Report (MRR)	E.2.c.5)	October 1, 2013	Annually
Monitoring Site Prioritization (Tier 2)	E.2.c.1)	March 1, 2014	Within 8 months of the effective date
Municipal Coordination Plan	E.2.b.1)b)	October 1, 2013	To be Included in the SWMP and Progress Report as part of the Annual Report
Overall Program Effectiveness Evaluation	E.2.m.3)	October 1, 2013	Annually as part of the Annual Report
Public Education Program Progress Report	E.2.l.2)	October 1, 2013	Annually as part of the Annual Report
Self-Audit - (includes construction activities)	E.2.m.2)	October 1, 2013	Annually as part of the Annual Report
Stormwater Monitoring & BMP Development Status Report	E.2.e.	October 1, 2013	Annually as part of the Annual Report
Stormwater Treatment BMP Technology Report	E.2.e.	October 1, 2013	Annually as part of the Annual Report
TMDL Status Review Report	E.4.b.	October 1, 2015	Annually as part of the Annual Report
Updated Stormwater Management Plan (SWMP)	E.1.a.	October 1, 2013	Revisions as part of the Annual Report
Waste Management Plan	E.2.h.3)c)iii)	July 1, 2014	Within 1 year of the Effective Date

Note: This table is a partial list of reporting requirements. The Department shall submit all required reports as provided in the Order. Any discrepancy between the text of the NPDES Permit and this table will be resolved in favor of the Permit.

Effective Date of this Order is July 1, 2013

Effective Date of the ASBS Special Protections (General Exception) is March 20, 2012

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ATTACHMENT X — REFERENCES

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ATTACHMENT 39

NPDES Permit No. DC0000221

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT**

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments
tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009,
subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements
and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.



Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

PERMIT FOR THE DISTRICT OF COLUMBIA
MUNICIPAL SEPARATE STORM SEWER SYSTEM

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- 9. PERMIT DEFINITIONS

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINISTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

permit, and shall be at least as protective of water quality as the federal Clean Water Act and its implementing regulations require.

2.1.3 The permittee shall ensure that the above legal authority in no way restricts its ability to enter into inter-jurisdictional agreements with other District agencies and/or other jurisdictions affected through this permit.

2.1.4 Review and revise, where applicable, building, health, road and transportation, and other codes and regulations to remove barriers to, and facilitate the implementation of the following standards: (1) standards resulting from issuance of District stormwater regulations required by Section 2.1, paragraph 1 herein; and (2) performance standards required by this permit.

2.2 Fiscal Resources

The permittee, including all agencies and departments of the District as specified in section 2.3 below, shall provide adequate finances, staff, equipment and support capabilities to implement the existing Stormwater Management Program (SWMP) and the provisions of this permit. For the core program the District shall provide a dedicated funding source. Each annual report under Part 6 of this permit shall include a demonstration of adequate fiscal capacity to meet the requirements of this permit.

2.3 Stormwater Management Program Administration/Permittee Responsibilities

2.3.1 The Government of the District of Columbia is the permittee, and all activities of all agencies, departments, offices and authorities of the District must comply with the requirements of this permit. The permittee has designated the District Department of the Environment (DDOE) as the agency responsible for managing the MS4 Stormwater Management Program and all activities necessary to comply with the requirements of this permit and the Comprehensive Stormwater Management Enhancement Amendment Act of 2008 by coordinating and facilitating a collaborative effort among other city agencies and departments including but not limited to departments designated as "Stormwater Agencies" by the Comprehensive Stormwater Management Enhancement Amendment Act of 2008:

District Department of Transportation (DDOT);
Department of Public Works (DPW);
Office of Planning (OP);
Office of Public Education Facilities Modernization (OPEFM);
Department of Real Estate Services (DRES);
Department of Parks and Recreation; and
DC Water and Sewer Authority (also known as and hereinafter referred to as DC Water).

Each named entity is responsible for complying with those elements of the permit within its jurisdictional scope and authorities.

2.3.2 DDOE shall coordinate, and all agencies, offices, departments and authorities shall implement provisions of the existing MS4 Task Force Memorandum of Understanding (MOU) dated 2000, updated matrix of responsibilities (January 2008), any subsequent updates, and other institutional agreements to coordinate compliance activities among agency partners to implement the provisions of this permit. DDOE's major responsibilities under these MOUs and institutional agreements shall include:

1. Convening regular meetings and communication with MS4 Task Force agencies and other committees established to implement this permit to budget, assign and implement projects, and monitor, inspect and enforce all activities required by the MS4 permit.
2. Providing technical and administrative support for the MS4 Task Force and other committees established to implement this permit
3. Evaluating, assessing, and synthesizing results of the monitoring and assessment programs and the effectiveness of the implementation of management practices and coordinating necessary adjustments to the stormwater management program in order to ensure compliance.
4. Coordinating the completion and submission of all deliverables required by the MS4 Permit.
5. Projecting revenue needs to meet MS4 Permit requirements, overseeing the District's stormwater fees to fulfill revenue needs, and coordinating with DC Water to ensure the District's stormwater fee is collected.
6. Making available to the public and other interested and affected parties, the opportunity to comment on the MS4 stormwater management program.

2.3.3 Within 180 days of permit issuance, the permittee shall complete an assessment of additional governmental agencies and departments, non-governmental organizations, watershed groups or other community organizations in the District and adjacent states to partner with to administer required elements of the permit. Intra- and inter-agency agreements between relevant governmental and nongovernmental organizations shall be established to ensure successful coordination and implementation of stormwater management activities in accordance with the requirements of this permit. Additional government and nongovernmental organizations and programs to consider include; land use planning, brownfields redevelopment, fire department, building and safety, public health, parks and recreation, and federal departments and agencies, including but not limited to, the National Park Service, Department of Agriculture, Department of Defense, and General Services Administration, responsible for facilities in the District.

3. STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

The permittee shall continue to implement, assess and upgrade all of the controls, procedures and management practices, described in this permit, and in the SWMP dated

February 19, 2009, and any subsequent updates. This Program has been determined to reduce the discharge of pollutants to the maximum extent practicable. The Stormwater Management Program is comprised of all requirements in this permit. All existing and new strategies, elements, initiatives, schedules or programs required by this permit must be documented in the SWMP Plan, which shall be the consolidated document of all stormwater program elements. Updates to the plan shall be consistent with all compliance deadlines in this permit. A current plan shall be posted on the District's website at an easily accessible location at all times.

New Stormwater Management Program strategies, elements, initiatives and plans required to be submitted to EPA for review and approval are included in Table 1.

TABLE 1
Elements Requiring EPA Review and/or Approval

Element	Submittal Date (from effective date of this permit)
Anacostia River Watershed Trash Reduction Calculation Methodology (4.10)	1 year
Catch Basin Operation and Maintenance Plan (4.3.5.1)	18 months
Outfall Repair Schedule (4.3.5.3)	18 months
Off-site Mitigation/Payment-in-Lieu Program (4.1.3)	18 months
Retrofit Program (4.1.6)	2 years
Consolidated TMDL Implementation Plan (4.10.3)	2 years
Revised Monitoring Program (5.1)	2 years
Revised Stormwater Management Program Plan (3)	4 years

No later than 3 years from the issuance date of this permit the permittee shall public notice a fully updated Plan including all of the elements required in this permit. No later than 4 years from the issuance date of this permit the permittee shall submit to EPA the fully updated plan for review and approval, as part of the application for permit renewal.

The measures required herein are terms of this permit. These permit requirements do not prohibit the use of 319(h) funds for other related activities that go beyond the requirements of this permit, nor do they prohibit other sources of funding and/or other programs where legal or contractual requirements preclude direct use for stormwater permitting activities.

TABLE 2
Legal Authority for Selected Required Program Stormwater Elements

Required Program Application Element	Regulatory References
Adequate Legal Authority	40 C.F.R. § 122.26(d)(2)(I)(C)-(F)

Green technology stormwater management practices, which incorporate technologies and practices across District activities.	Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution)
Existing Structural and Source Controls	40 C.F.R. § 122.26(d)(2)(iv)(A)(1)
Roadways	40 C.F.R. § 122.26(d)(2)(iv)(A)(3)
Pesticides, Herbicides, and Fertilizers Application	40 C.F.R. § 122.26(d)(2)(iv)(A)(6)
Municipal Waste Sites	40 C.F.R. § 122.26(d)(2)(iv)(A)(5)
Spill Prevention and Response	40 C.F.R. § 122.26(d)(2)(iv)(B)(4)
Infiltration of Seepage	40 C.F.R. § 122.26(d)(2)(iv)(B)(7)
Stormwater Management Program for Commercial and Residential Areas	40 C.F.R. § 122.26(d)(2)(iv)(A)
Manage Critical Source Areas	40 C.F.R. § 122.26(d)(iii)(B)(6)
Stormwater Management for Industrial Facilities	40 C.F.R. § 122.26(d)(2)(iv)(C)
Industrial and High Risk Runoff	40 C.F.R. § 122.26(d)(2)(iv)(C), (iv)(A)(5)
Identify Priority Industrial Facilities	40 C.F.R. § 122.26(d)(2)(iv)(C)(1)
Illicit Discharges and Improper Disposal	40 C.F.R. § 122.26(d)(2)(iv)(B)(1)-(5), (iv)(B)(7)
Flood Control Projects	40 C.F.R. § 122.26(d)(2)(iv)(A)(4)
Public Education and Participation	40 C.F.R. § 122.26(d)(2)(iv)(A)(6), (iv)(B)(5), (iv)(B)(6)

Monitoring and Assessment and Reporting	40 C.F.R. § 122.26(d)(2)(iv)(D)(v)
Monitoring Program	40 C.F.R. § 122.26(d)(2)(iv)(B)(2), (iii), iv(A), (iv)(C)(2)
Characterization Data	40 C.F.R. § 122.26(d)(2)(iii)(B)-(D), 40 C.F.R. § 122.21(g)(7)
Reporting	40 C.F.R. § 122.41(l)

4. IMPLEMENTATION OF STORMWATER CONTROL MEASURES

4.1 Standard for Long-Term Stormwater Management

The permittee shall continue to develop, implement, and enforce a program in accordance with this permit and the permittee's updated SWMP Plan that integrates stormwater management practices at the site, neighborhood and watershed levels that shall be designed to mimic pre-development site hydrology through the use of on-site stormwater retention measures (e.g., harvest and use, infiltration and evapotranspiration), through policies, regulations, ordinances and incentive programs

4.1.1 Standard for Stormwater Discharges from Development

No later than 18 months following issuance of this permit, the permittee shall, through its Updated DC Stormwater Regulations or other permitting or regulatory mechanisms, implement one or more enforceable mechanism(s) that will adopt and implement the following performance standard for all projects undertaking development that disturbs land greater than or equal to 5,000 square feet:

Require the design, construction and maintenance of stormwater controls to achieve on-site retention of 1.2" of stormwater from a 24-hour storm with a 72-hour antecedent dry period through evapotranspiration, infiltration and/or stormwater harvesting and use for all development greater than or equal to 5,000 square feet.

The District may allow a portion of the 1.2" volume to be compensated for in a program consistent with the terms and requirements of Part 4.1.3.

4.1.2 Code and Policy Consistency, Site Plan Review, Verification and Tracking

By the end of this permit term the District must review and revise, as applicable, stormwater, building, health, road and transportation, and other codes and regulations to remove barriers to, and facilitate the implementation of the retention performance standard required in

Section 4.1.1. The District must also establish/update and maintain a formal process for site plan reviews and a post-construction verification process (e.g., inspections, submittal of as-builts) to ensure that standards are appropriately implemented. The District must also track the on-site retention performance of each project subject to this regulatory requirement.

4.1.3 Off-Site Mitigation and/or Fee-in Lieu for all Facilities

Within 18 months of the effective date of this permit the District shall develop, public notice, and submit to EPA for review and comment an off-site mitigation and/or fee-in-lieu program to be utilized when projects will not meet stormwater management performance standard as defined in Section 4.1.1. The District has the option of implementing an off-site mitigation program, a fee-in-lieu program, or both. Any allowance for adjustments to the retention standard shall be defined in the permittee's regulations. The program shall include at a minimum:

1. Establishment of baseline requirements for on-site retention and for mitigation projects. On-site volume plus off-site volume (or fee-in-lieu equivalent or other relevant credits) must equal no less than the relevant volume in Section 4.1.1;
2. Specific criteria for determining when compliance with the performance standard requirement for on-site retention cannot technically be met based on physical site constraints, or a rationale for why this is not necessary;
3. For a fee-in-lieu program, establishment of a system or process to assign monetary values at least equivalent to the cost of implementation of controls to account for the difference in the performance standard, and the alternative reduced value calculated; and
4. The necessary tracking and accounting systems to implement this section, including policies and mechanisms to ensure and verify that the required stormwater practices on the original site and appropriate required off-site practices stay in place and are adequately maintained.

The program may also include incentives for achieving other important environmental objectives such as ongoing measurable carbon sequestration, energy savings, air quality reductions in green house gases, or other environmental benefits for which the program can develop methods for quantifying and documenting those outcomes. Controls implemented to achieve those outcomes are subject to the same level of site plan review, inspection, and operation and maintenance requirements as stormwater controls.

District-owned transportation right-of-way projects are subject to a similarly stringent process for determining an alternate performance volume, but for the duration of this permit term need not conduct off-site mitigation or pay into a fee-in-lieu program to compensate for the difference.

4.1.4 Green Landscaping Incentives Program

No later than one year following permit issuance, the permittee shall develop an incentive program to increase the quantity and quality of planted areas in the District while allowing flexibility for developers and designers to meet development standards. The Incentive Program

shall use such methods as a scoring system to encourage green technology practices such as larger plants, permeable paving, green roofs, vegetated walls, preservation of existing trees, and layering of vegetation along streets and other areas visible to the public.

4.1.5 Retrofit Program for Existing Discharges

4.1.5.1 Within two years of the effective date of this permit the District shall develop, public notice, and submit to EPA for review and approval a program that establishes performance metrics for retrofit projects. The District shall fully implement the program upon EPA approval. The starting point for the performance metrics shall be the standard in Section 4.1.1. Performance metrics may be established generally for all retrofit projects, or for categories of projects, e.g., roads, sidewalks, parking lots, campuses. Specific site conditions may constitute justifications for setting a performance standard at something less than the standard in Section 4.1.1, and a similar calculator or algorithm process may be used in conjunction with a specific site analysis.

4.1.5.2 The District, with facilitation assistance from EPA Region III, will also work with major Federal landholders, such as the General Services Administration and the Department of Defense, with the objective of identifying retrofit opportunities, documenting federal commitments, and tracking pollutant reductions from relevant federal actions.

4.1.5.3 For each retrofit project estimate the potential pollutant load and volume reductions achieved through the DC Retrofit program by major waterbody (Rock Creek, Potomac, Anacostia) for the following pollutants: Bacteria (E. coli), Total Nitrogen, Total Phosphorus, Total Suspended Solids, Cadmium, Copper, Lead, Zinc, and Trash. These estimates shall be included in the annual report following implementation of the project.

4.1.5.4 The DC Retrofit Program shall implement retrofits for stormwater discharges from a minimum of 18,000,000 square feet of impervious surfaces during the permit term. A minimum of 1,500,000 square feet of this objective must be in transportation rights-of-way.

4.1.5.5 No later than 18 months following issuance of this permit, the permittee shall, through its Updated DC Stormwater Regulations or other permitting or regulatory mechanisms, implement an enforceable mechanism that will adopt and implement stormwater retention requirements for properties where less than 5,000 square feet of soil is being disturbed but where the buildings or structures have a footprint that is greater than or equal to 5,000 square feet and are undergoing substantial improvement. Substantial improvement, as consistent with District regulations at 12J DCMR § 202, is any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. The characteristics of these types of projects may constitute justifications for setting a performance standard at something less than the standard in Section 4.1.1.

4.1.5.6 The permittee shall ensure that every major renovation/rehabilitation project for District-owned properties within the inventory of DRES and OPEFM (e.g., schools and school administration buildings) includes on-site stormwater retention measures, including but not

limited to green roofs, stormwater harvest/reuse, and/or other practices that can achieve the retention performance standard.

4.1.6 Tree Canopy

4.1.6.1 No later than one year following issuance of this permit, the District shall develop and public notice a strategy to reduce the discharge of stormwater pollutants by expanding tree canopy throughout the city. The strategy shall identify locations throughout the District where tree plantings and expanded tree boxes are technically feasible and commit to specific schedules for implementation at locations throughout the District, with highest priority given to projects that offer the greatest stormwater retention potential. The strategy shall also include the necessary elements to achieve the requirements of Section 4.1.6.2.

4.1.6.2 The District shall achieve a minimum net annual tree planting rate of 4,150 plantings annually within the District MS4 area, with the objective of a District-wide urban tree canopy coverage of 40% by 2035. The annual total tree planting shall be calculated as a net increase, such that annual mortality is also included in the estimate. The District shall ensure that trees are planted and maintained, including requirements for adequately designed and sized tree boxes, to achieve optimal stormwater retention and tree survival rate. Trees shall be planted in accordance with the Planting Specifications issued by the International Society of Arboriculture as appropriate to the site conditions.

4.1.6.3 The District shall annually document the total trees planted and make an annual estimate of the volume of stormwater that is being removed from the MS4 (and combined system, as relevant) in a typical year of rainfall as a result of the maturing tree canopy over the life of the MS4 permit. Also report annually on the status of achieving 40% canopy District-wide.

4.1.7 Green Roof Projects

4.1.7.1 Complete a structural assessment of all District properties maintained by DRES and slated for redevelopment to determine current roof conditions and the feasibility for green roof installation. These assessments shall be performed on an ongoing basis for all properties as they are considered for redevelopment. Based on the structural assessment and other factors, identify all District-owned properties where green roof projects are technically feasible and commit to specific schedules for implementing these projects. Highest priority shall be given to projects that offer the greatest stormwater capture potential.

4.1.7.2 The permittee shall install at a minimum 350,000 square feet of green roofs on District properties during the term of the permit (including schools and school administration buildings).

4.1.7.3 Document the square footage of green roof coverage in the District, whether publicly or privately owned, report any incentive programs implemented during the permit term, and estimate the volume of stormwater that is being removed from the MS4 (and combined

system, as relevant) in a typical year of rainfall as a result of the combined total green roof facilities in the District.

4.2 Operation and Maintenance of Stormwater Capture Practices

4.2.1 District Owned and Operated Practices.

Within two years of the effective date of this permit, develop and implement operation and maintenance protocols and guidance for District-owned and operated on-site retention practices (development and retrofits) to include maintenance needs, inspection frequencies, estimated maintenance frequencies, and a tracking system to document relevant information. Provide training to all relevant municipal employees and contractors, with regular refreshers, as necessary.

4.2.2 Non-District Owned and Operated Practices.

In conjunction with updating of relevant ordinances and policies, develop accountability mechanisms to ensure maintenance of stormwater control measures on non-District property. Those mechanisms may include combinations of deed restrictions, ordinances, maintenance agreements, or other policies deemed appropriate by the District. The District must also include a long-term verification process of O&M, which may include municipal inspections, 3rd party inspections, owner/operator certification on a frequency deemed appropriate by the District, and/or other mechanisms. The District must continue to maintain an electronic inventory of practices on private property to include this information.

4.2.3 Stormwater Management Guidebook and Training

4.2.3.1 No later than 18 months from the permit issuance date, the permittee shall finalize a Stormwater Management Guidebook to be available for wide-spread use by land use planners and developers. The Stormwater Management Guidebook shall provide regular updates, as applicable, in a format that facilitates such regular updates, and shall include objectives and specifications for integration of stormwater management technologies, including on site retention practices, in the areas of:

- a. Site Assessment.
- b. Site Planning and Layout.
- c. Vegetative Protection, Revegetation, and Maintenance.
- d. Techniques to Minimize Land Disturbance.
- e. Techniques to Implement Measures at Various Scales.
- f. Integrated Water Resources Management Practices.
- g. Designing to meet the required performance standard(s).
- h. Flow Modeling Guidance.
- i. Hydrologic Analysis.
- j. Construction Considerations.
- k. Operation and Maintenance

4.2.3.2 The permittee shall continue to provide key industry, regulatory, and other stakeholders with information regarding objectives and specifications of green infrastructure practices contained in the Stormwater Management Guidebook through a training program. The Stormwater Management training program will include at a minimum the following:

- a. Stormwater management/green technology practices targeted sessions and materials for builders, design professionals, regulators, resource agencies, and stakeholders.
- b. Materials and data from stormwater management/green technology practices pilot projects and demonstration projects including case studies.
- c. Design and construction methods for integration of stormwater management/green technology practices measures at various project scales.
- d. Guidance on performance and cost of various types of stormwater management/green technology practices measures in the District.

4.3 Management of for District Government Areas

Procedures to reduce the discharge of pollutants in stormwater runoff shall include, but not be limited to:

4.3.1 Sanitary Sewage System Maintenance Overflow and Spill Prevention Response

The permittee shall coordinate with DC Water to implement an effective response protocol for overflows of the sanitary sewer system into the MS4. The response protocol shall clearly identify agencies responsible and telephone numbers and e-mail for any contact and shall contain at a minimum, procedures for:

- 1. Investigating any complaints received within 24 hours of the incident report.
- 2. Responding within two hours to overflows for containment.
- 3. Notifying appropriate sewer, public health agencies and the public within 24 hours when the sanitary sewer overflows to the MS4.

This provision in no way authorizes sanitary sewer overflow discharges either directly or via the MS4.

4.3.2 Public Construction Activities Management

The permittee shall implement and comply with the Development and Redevelopment and the Construction requirements in Part 4.6 of this permit at all permittee-owned or operated public construction projects.

The permittee shall obtain discharge authorization under the applicable EPA Construction General permit for construction activities and comply with provisions therein.

4.3.3 Vehicle Maintenance/Material Storage Facilities/ Municipal Operations.

The permittee shall implement stormwater pollution prevention measures at all permittee-owned, leased facilities and job sites including but not limited to vehicle/ equipment maintenance facilities, and material storage facilities.

For vehicle and equipment wash areas and municipal facilities constructed, redeveloped, or replaced, the permittee shall eliminate discharges of wash waters from vehicle and equipment washing into the MS4 by implementing any of the following measures at existing facilities with vehicle or equipment wash areas:

1. Self-contain, and haul off-site for disposal;
2. Equip with a clarifier; or
3. Equip with an alternative pre-treatment device.

4.3.4 Landscape and Recreational Facilities Management, Pesticide, Herbicide, Fertilizer and Landscape Irrigation

4.3.4.1 The permittee shall further reduce pollutants and pollutant discharges associated with the storage and application of pesticides, fertilizers, herbicides, the use of other toxic substances and landscape irrigation according to an integrated pest management program (IPM). The IPM shall be an ecosystem based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, use of resistant varieties, and use of low or no chemical and irrigation input landscapes, in accordance with the provisions of this permit, procedures and practices described in the SWMP and regulations.

The permittee shall further utilize IPM controls to reduce pollutants related to the storage and application of pesticides, herbicides, and fertilizers applied by employees or contractors, to public rights-of-way, parks, and other District property to ensure that:

- a. Pesticides are used only if monitoring indicates they are needed according to established guidelines;
- b. Fertilizers are used only when soil tests indicate that they are necessary, and only in minimum amounts and for needed purposes (e.g., seed germination).
- c. Treatments are made with the purpose of removing only the target organism;
- d. Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial, non-target organisms, and the environment;
- e. No pesticides or fertilizers are applied to an area immediately prior to an expected rain event, or during or immediately following a rain event, or when water is flowing off the area;
- f. No banned or unregistered pesticides are stored or applied;

- g. All staff applying pesticides are certified or are under the direct supervision of a pesticide applicator certified in the appropriate category;
- h. Procedures are implemented to encourage the retention and planting of native and/or non-invasive, naturalized vegetation to reduce water, pesticide and fertilizer needs;
- i. Pesticides and fertilizers are stored indoors or under cover on paved surfaces or enclosed in secondary containment and storage areas inspected regularly to reduce the potential for spills; and
- j. Landscapes that maximize on-site retention of stormwater, while minimizing mowing, chemical inputs and irrigation are given preference for all new landscape installation.

4.3.4.2 The District shall coordinate internally among departments for the purpose of ensuring that pesticide and fertilizer use within its jurisdiction does not threaten water quality.

4.3.4.3 The District shall partner with other organizations to ensure that pesticide and fertilizer use within their jurisdiction does not threaten water quality.

4.3.4.4 The District shall continue to conduct education and outreach, as well as provide incentives, to curtail the use of turf-grass fertilizers for the purpose of reducing nitrogen and phosphorous discharges to surface waters. The program shall incentivize the use of vegetative landscapes other than turf grass and other measures to restrict the use of turf grass fertilizers.

4.3.4.5 The District shall use GIS layers of public land and sewersheds, as well as background data, to identify priority areas for a targeted strategy to reduce the sources of pesticides, herbicides, and fertilizers that contaminate the stormwater runoff, and report progress toward completing the screening characterization in the next Updated SWMP.

4.3.4.6 The District shall include in each Annual Report a report on the implementation of the above application procedures, a history of the improvements in the control of these materials, and an explanation on how these procedures will meet the requirements of this permit.

4.3.5 Storm Drain System Operation and Management and Solids and Floatables Reduction

4.3.5.1 Within 18 months of the effective date of this permit, the District shall complete, public notice and submit to EPA for review and approval a plan for optimal catch basin inspections, cleaning and repairs. The District shall fully implement the plan upon EPA approval.

4.3.5.2 Until such time as the catch basin maintenance study has been completed and approved, the permittee shall ensure that each catch basin within the DC MS4 Permit Area is cleaned at least once annually during the life of the permit. The permittee shall continue to use strategies for coordinated catch basin cleaning and street-sweeping that will optimize reduction of stormwater pollutants.

4.3.5.3 Within 18 months of the effective date of this permit, and consistent with the 2006 Outfall Survey, the District shall complete, public notice and submit to EPA for review and approval an outfall repair schedule to ensure that approximately 10% of all outfalls needing repair are repaired annually, with the overall objective of having all outfalls in good repair by 2022. This schedule may be combined with the catch basin maintenance study outlined in 4.3.5.1. The repair schedule shall be fully implemented upon EPA approval.

4.3.5.4 The permittee shall comply with the Anacostia River Trash TMDL implementation provisions in Part 4.10 of this permit and apply the technologies and other activities developed in the Anacostia River Watershed Trash TMDL throughout the entire MS4 Permit Area. The permittee shall continue to report the progress of trash reduction in the Consolidated Annual Report.

4.3.6 Streets, Alleys and Roadways

4.3.6.1 Street sweeping shall be conducted on no less than 641 acres of roadway in the MS4 area annually in accordance with the following schedule:

TABLE 3
Street Sweeping

Area/Street Classification	Frequency
Arterials-heavily developed commercial and central business districts with considerable vehicular and pedestrian traffic	At least nine (9) times per year
Industrial areas	At least six (6) times per year
Residential-residential areas with limited throughway and pedestrian traffic AND neighborhood streets which are used for local purposes only	At least four (4) times per year
Central Business District/Commercial-neighborhood business districts and main streets with moderate vehicular and pedestrian traffic	At least one (1) time every two weeks
Environmental hot spots in the	At least two (2) times per month

4.3.6.2 Standard road repair practices shall include limiting the amount of soil disturbance to the immediate area under repair. Stormwater conveyances which are denuded shall be resodded, reseeded and mulched, or otherwise stabilized for rapid revegetation, and these areas should have effective erosion control until stabilized.

4.3.6.3 The permittee shall continue to evaluate and update the use, application and removal of anti-icers, chemical deicers, salt, sand, and/or sand/deicer mixtures in an effort to minimize the impact of these materials on water quality. The permittee shall investigate and implement techniques available for reducing pollution from deicing salts in snowmelt runoff and runoff from salt storage facilities. The permittee shall evaluate and implement the use of porous/permeable surfaces that require less use of deicing materials and activities. This evaluation shall be made a part of an overall investigation of ways to meet the requirements of the Clean Water Act and reported in each Annual Report.

4.3.6.4 The permittee shall continue to implement and update a program to ensure that excessive quantities of snow and ice control materials do not enter the District's water bodies. The permittee shall report its progress in implementing the program in each Annual Report. Except during a declared Snow Emergency when the permittee determines that the foremost concern of snow removal activities is public health and safety, it shall avoid snow dumping or storage in areas adjacent to water bodies, wetlands, and areas near public or private drinking water wells which would ultimately reenter the MS4.

4.3.7 Infrastructure Maintenance/Pollution Source Control Maintenance

The permittee shall continue to implement an operation and maintenance program that incorporates good housekeeping components at all municipal facilities located in the DC MS4 Permit Area, including but not limited to; municipal waste water treatment facility, potable drinking water facility, municipal fleet operations, maintenance garages, parks and recreation, street and infrastructure maintenance, and grounds maintenance operations, libraries and schools. The permittee shall document the program in the Annual Report, as required at Section 6.2 herein. The permittee shall, at a minimum:

1. Continue to implement maintenance standards at all municipal facilities that will protect the physical, chemical and biological integrity of receiving waters.
2. Continue to implement an inspection schedule in which to perform inspections to determine if maintenance standards are being met. Inspections shall be performed no less than once per calendar year and shall provide guidance in Stormwater Pollution Prevention Plan development and implementation, where needed.
3. Continue to implement procedures for record keeping and tracking inspections and maintenance at all municipal facilities.

4. Continue to implement an inspection and maintenance program for all permittee-owned management practices, including post-construction measures.
5. Continue to ensure proper operation of all treatment management practices and maintain them as necessary for proper operation, including all post-construction measures.
6. Ensure that any residual water following infrastructure maintenance shall be self-contained and disposed of legally in accordance with the Clean Water Act.

4.3.8 Public Industrial Activities Management/Municipal and Hazardous Facilities

For any municipal activity associated with industrial activity, as defined by 40 C.F.R. § 122.26, which discharges stormwater to, from and through the DC MS4, the permittee shall obtain separate coverage under either: (1) the EPA Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP) (As modified May 27, 2009); or (2) an individual permit.

4.3.9 Emergency Procedures

The permittee may conduct repairs of essential public service systems and infrastructure in emergency situations. An emergency includes only those situations included as conditions necessary for demonstration of an upset at 40 C.F.R. 122.41(n). For each claimed emergency, the permittee shall submit to the Permitting Authority a statement of the occurrence of the emergency, an explanation of the circumstances, and the measures that were implemented to reduce the threat to water quality, no later than required by applicable Clean Water Act regulations.

4.3.10 Municipal Official Training

The permittee shall continue to implement an on-going training program for those employees specified below, and any other employees whose job functions may impact stormwater program implementation. The training program shall address the importance of protecting water quality, the requirements of this permit, design, performance, operation and maintenance standards, inspection procedures, selecting appropriate management practices, ways to perform their job activities to prevent or minimize impacts to receiving waters, and procedures for tracking, inspecting and reporting, including potential illicit discharges. The permittee shall provide follow-up and refresher training at a minimum of once every twelve months, and shall include any changes in procedures, techniques or requirements.

The training program shall include, but is not limited to, those employees who work in the following areas:

1. Municipal Planning
2. Site plan review

3. Design
 4. Construction
 5. Transportation planning and engineering
 6. Street/sewer and right-of-way construction and maintenance
 7. Water and sewer departments
 8. Parks and recreation department
 9. Municipal water treatment and waste water treatment
 10. Fleet maintenance
 11. Fire and police departments
 12. Building maintenance and janitorial
 13. Garage and mechanic crew
 14. Contractors and subcontractors who may be contracted to work in the above described
 15. areas
 16. Personnel responsible for answering questions about the permittee's stormwater program,
 17. including persons who may take phone calls about the program
 18. Any other department of the permittee that may impact stormwater runoff
- 4.4 Management of Commercial and Institutional Areas

The District shall establish and implement policies and procedures to reduce the discharge of pollutants in stormwater runoff from all commercial and institutional (including federal) areas covered by this permit.

The permittee shall ensure maintenance of all stormwater management controls in commercial and institutional land areas in accordance with the following provisions:

1. Tracking all controls;
2. Inspecting all controls on a regular basis, according to an inspection schedule;
3. Ensure compliance with the MS4 permit and municipal ordinances at commercial and institutional facilities.

4.4.1 Inventory of Critical Sources and Source Controls

4.4.1.1 The permittee shall continue to maintain a watershed-based inventory or database of all facilities within its jurisdiction that are critical sources of stormwater pollution. Critical sources to be tracked shall include the following:

- a. Automotive service facilities, e.g., service, fueling and salvage facilities;
- b. Industrial activities, as defined at 40 C.F.R. §§ 122.26(b)(14); and
- c. Construction sites exceeding one acre, or sites under one acre that are part of a larger common plan of development.
- d. Dry cleaners
- e. Any other facility the District has identified as a Critical Source

4.4.1.2 The permittee shall include the following minimum fields of information for each industrial and commercial facility identified as a critical source:

- a. Name of facility and name of owner/ operator;
- b. Address of facility;
- c. Size of facility; and
- d. Activities conducted at the facility that could impact stormwater.
- e. Practices and/or measures to control pollutants.
- f. Inspection and maintenance schedules, dates and findings.

4.4.1.3 The permittee shall update its inventory of critical sources at least annually. The update may be accomplished through collection of new information obtained through field activities or through other readily available inter and intra-agency informational databases (e.g. business licenses, pretreatment permits, sanitary sewer hook-up permits, and similar information).

4.4.2 Inspection of Critical Sources

The permittee shall continue to inspect all commercial facilities identified in Part 4.4.1. herein and any others found to be critical sources twice during the five-year term of the permit. A minimum interval of six months between the first and the second mandatory compliance inspection is required, unless a follow-up inspection to ensure compliance must occur sooner.

4.4.3 Compliance Assurance.

At each facility identified as a critical source, the permittee's inspector(s) shall verify that the operator is implementing a control strategy necessary to protect water quality. Where the permittee determines that existing measures are not adequate to protect water quality, the permittee shall require additional site-specific controls sufficient to protect water quality.

4.5 Management of Industrial Facilities and Spill Prevention

4.5.1 The District shall continue to implement a program to monitor and control pollutants in stormwater discharged from Industrial Facilities located within the MS4 Permit Area, as defined herein, pursuant to the requirements in 40 C.F.R. § 122.26(d)(2)(iv)(C). These facilities shall include, but are not limited to:

- a. Private Solid Waste Transfer Stations
- b. Hazardous Waste Treatment, Disposal, and/or Recovery Plants
- c. Industrial Facilities subject to SARA or EPCRA Title III
- d. Industrial Facilities with NPDES Permits
- e. Industrial facilities with a discharge to the MS4

4.5.2 The District shall continue to maintain and update the industrial facilities database.

4.5.3 The District shall continue to perform or provide on-site assistance/inspections and outreach focused on the development of stormwater pollution prevention plans and NPDES permit compliance.

4.5.4 The District shall continue to refine and implement procedures to govern the investigation of facilities suspected of contributing pollutants to the MS4, including at a minimum: (i) a review, if applicable, of monitoring data collected by the facility pursuant to its NPDES permit; and (ii) wet weather screening as required by Part 5.2.1 herein (including collecting data on discharges from industrial sites). These procedures shall be submitted as part of each Annual Report required by Part 6.2 herein.

4.5.5 The District shall continue to implement the prohibition against illicit discharges, control spills, and prohibit dumping. Continue to implement a program to prevent, contain, and respond to spills that may discharge to the MS4, and report on such implementation submitted in each Annual Report. The spill response program may include a combination of spill response actions by the permittee and/or another public or private entity.

4.5.6 The District shall report progress in developing and carrying out industrial-related programs in each Annual Report required by Section 6 herein. Provide an explanation as to how the implementation of these procedures will meet the requirements of the Clean Water Act.

4.6 Stormwater Management for Construction Sites

4.6.1 Continue implementation of the Program that reduces the discharge of pollutants from construction sites. In each Annual Report, the permittee shall evaluate and report to determine if the existing practices meet the requirements of 40 C.F.R. § 122.26(d)(2)(iv)(A) and (D).

4.6.2 Continue the review and approval process of the sediment and erosion control plans under this program. Also, the permittee shall ensure that all construction projects impacting one acre or greater, or less than one acre when part of a larger common plan of development or sale equal to or larger than one acre, are not authorized until documentation is provided that they have received EPA NPDES Construction General Permit Coverage.

4.6.3 Continue to implement inspection and enforcement procedures, including but not limited to inspection of permitted construction sites that disturb more than 5,000 square feet of soil as follows:

1. First inspection prior to ground disturbing activities to review planned sediment and erosion control measures;
2. Second inspection to verify proper installation and maintenance of sediment and erosion control measures;
3. Third inspection to review planned installation and maintenance of stormwater BMPs;

4. Fourth inspection to verify proper installation of stormwater management practices following final stabilization of the project site; and
5. Other inspections as necessary to ensure compliance with relevant standards and requirements.

4.6.4 When a violation of local erosion and sediment control ordinances occurs, the permittee shall follow existing enforcement procedures and practices using standardized reports as part of the inspection process to provide accurate record keeping of inspections of construction sites. The permittee shall use a listing of all violations and enforcement actions to assess the effectiveness of the Enforcement Program in each Annual Report.

4.6.5 Continue with educational measures for construction site operators (Section 4.9 of this permit) that consist, at a minimum, of providing guidance manuals and technical publications.

4.6.6 Report progress in developing and carrying out the above construction-related programs in each Annual Report required by Parts 6.2 herein, including: (i) an explanation as to how the implementation of these procedures will meet the requirements of the Clean Water Act; (ii) an explanation as to how the implementation of these procedures, particularly with regard to District "waivers and exemptions", will meet the requirements of the Clean Water Act; and (iii) discussion of progress toward meeting TMDL and the District Watershed Implementation Plan deadlines.

4.7 Illicit Discharges and Improper Disposal.

4.7.1 The District shall continue to implement an ongoing program to detect illicit discharges, pursuant to the SWMP, and Part 4 of this permit, and to prevent improper disposal into the storm sewer system, pursuant to 40 C.F.R. § 122.26(d)(2)(iv)(B)(1). Such program shall include, at a minimum the following:

- a. An updated schedule of procedures and practices to prevent illicit discharges, as defined at 40 C.F.R. § 122.26(b)(2), and, pursuant to 40 C.F.R. § 122.26(d)(2)(iv)(B)(1), to detect and remove illicit discharges as defined herein;
- b. An updated inventory (organized by watershed) of all outfalls that discharge through the MS4 including any changes to the identification and mapping of existing permitted outfalls. Such inventory shall include, but not be limited to, the name and address, and a description (such as SIC code) which best reflects the principal products or services provided by each facility which may discharge to the MS4;
- c. Continue to implement an illicit connection detection and enforcement program to perform dry weather flow inspections in target areas;
- d. Visual inspections of targeted areas;

- e. Issuance of fines, tracking and reporting illicit discharges, and reporting progress on stopping targeted illicit discharges, and in appropriate cases, chemical testing immediately after discovery of an illicit discharge;
- f. Enforcement procedures for illicit discharges set forth in Part 4 herein;
- g. All necessary inspection, surveillance, and monitoring procedures to remedy and prevent illicit discharges. The permittee shall submit an inspection schedule, inspection criteria, documentation regarding protocols and parameters of field screening, and allocation of resources as a part of each Annual Report.
- h. The permittee shall continue to implement procedures to prevent, contain, and respond to spills that may discharge into the MS4. The permittee shall provide for the training of appropriate personnel in spill prevention and response procedures.
- i. The permittee shall report the accomplishments of this program in each Annual Report.

4.7.2 The District shall continue to ensure the implementation of a program to further reduce the discharge of floatables (e.g. litter and other human-generated solid refuse). The floatables program shall include source controls and, where necessary, structural controls.

4.7.3 The District shall continue to implement the prohibition against the discharge or disposal of used motor vehicle fluids, household hazardous wastes, grass clippings, leaf litter, and animal waste into separate storm sewers. The permittee shall ensure the implementation of programs to collect used motor vehicle fluids (at a minimum oil and anti-freeze) for recycle, reuse, and proper disposal and to collect household hazardous waste materials (including paint, solvents, pesticides, herbicides, and other hazardous materials) for recycle, reuse, or proper disposal. The permittee shall ensure that such programs are readily available within the District, and that they are publicized and promoted on a regular basis, pursuant to Public Education provisions in this permit at Part 4.9 herein.

4.7.4 The District shall continue to work with members of the Metropolitan Police Department to enhance illegal dumping enforcement.

4.7.5 The District shall implement the District's ban on coal tar pavement products, including conducting outreach and enforcement activities.

4.7.6 The District shall implement the Anacostia Clean Up and Protection Act of 2009, to ban the use of disposable non-recyclable plastic carryout bags and restrict the use on disposable carryout bags in certain food establishments.

4.8 Flood Control Projects

4.8.1 The District shall update the impervious surface analysis of floodplains six months after the approval of the revised Flood Insurance Rate Maps by the Federal Emergency Management Agency.

4.8.2 The District shall assess potential impacts on the water quality and the ability of the receiving water to support beneficial uses for all flood management projects. Evaluate the feasibility of retrofitting existing flood control devices to provide additional pollutant and volume removal from stormwater. Report results of such assessment, mapping program, and feasibility studies in the Annual Report (Part 6.2 herein).

4.8.3 The District shall review all development proposed in flood plain areas to ensure that the impacts on the water quality of receiving water bodies have been properly addressed. Information regarding impervious surface area located in the flood plains shall be used (in conjunction with other environmental indicators) as a planning tool. The permittee shall collect data on the percentage of impervious surface area located in flood plain boundaries for all proposed development beginning six months after the effective date of this permit. The permittee shall collect similar data for existing development in flood plain areas, in accordance with the mapping program and other activities designed to improve water quality. Critical unmapped areas shall be prioritized by the permittee with an emphasis on developed and developing acreage. Reports of this work shall be summarized in the Annual Report.

4.9 Public Education and Public Participation

The District shall continue to implement a public education program including but not limited to an education program aimed at residents, businesses, industries, elected officials, policy makers, planning staff and other employees of the permittee. The purpose of education is to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. Education initiatives may be developed locally or regionally.

4.9.1 Education and Outreach.

4.9.1.1 The District shall continue to implement its education and outreach program for the area served by the MS4 that was established during the previous permit cycle. The outreach program shall be designed to achieve measurable improvements in the target audience's understanding of stormwater pollution and steps they can take to reduce their impacts.

4.9.1.2 The permittee shall assess current education and outreach efforts and identify areas where additional outreach and education are needed. Audiences and subject areas to be considered include:

a. General public

- 1) General impacts of stormwater flows into surface waters
- 2) Impacts from impervious surfaces
- 3) Source control practices and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, landscaping, and rain water reuse.

- 4) A household hazardous waste educational and outreach program to control illicit discharges to the MS4 as required herein
- 5) Information and education on proper management and disposal of used oil, other automotive fluids, and household chemicals
- 6) Businesses, including home-based and mobile businesses
- 7) Management practices for use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials
- 8) Impacts of illicit discharges and how to report them including information for industries about stormwater permitting and pollution prevention plans and the requirement that they develop structural and non-structural control systems

b. Homeowners, landscapers and property managers

- 1) Use of low or no phosphorus fertilizers, alternatives to fertilizers, alternative landscaping requiring no fertilizers
- 2) Landscape designs to reduce runoff and pollutant loadings
- 3) Car washing alternatives with the objective of eliminating phosphorus detergent discharges
- 4) Yard care techniques that protect water quality
- 5) Management practices for use and storage of pesticides and fertilizers
- 6) Management practices for carpet cleaning and auto repair and maintenance
- 7) Runoff Reduction techniques, including site design, on-site retention, pervious paving, retention of forests and mature trees
- 8) Stormwater pond maintenance

c. Engineers, contractors, developers, review staff and land use planners

- 1) Technical standards for construction site sediment and erosion control
- 2) Runoff Reduction techniques, including site design, on-site reduction, pervious pavement, alternative parking lot design, retention of forests and mature trees
- 3) Stormwater treatment and flow control controls
- 4) Impacts of increased stormwater flows into receiving water bodies

4.9.2 Measurement of Impacts.

The permittee shall continue to measure the understanding and adoption of selected targeted behaviors among the targeted audiences. The resulting measurements shall be used to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.

4.9.3 Recordkeeping.

The permittee shall track and maintain records of public education and outreach activities.

4.9.4 Public Involvement and Participation,

The permittee shall continue to include ongoing opportunities for public involvement through advisory councils, watershed associations and/or committees, participation in developing updates to the stormwater fee system, stewardship programs, environmental activities or other similar activities. The permittee shall facilitate opportunities for direct action, educational, and volunteer programs such as riparian planting, volunteer monitoring programs, storm drain marking or stream clean up programs.

4.9.4.1 The permittee shall continue to create opportunities for the public to participate in the decision making processes involving the implementation and update of the permittee's SWMP. The permittee shall continue to implement its process for consideration of public comments on their SWMP.

4.9.4.2 The permittee shall continue to establish a method of routine communication to groups such as watershed associations and environmental organizations that are located in the same watershed(s) as the permittee, or organizations that conduct environmental stewardship projects located in the same watershed(s) or in close proximity to the permittee. This is to make these groups aware of opportunities for their direct involvement and assistance in stormwater activities that are in their watershed.

4.9.4.3 The permittee shall make all draft and approved MS4 documents required under this permit available to the public for comment. The current draft and approved SWMP and the MS4 annual reports deliverable documents required under this permit shall be posted on the permittee's website.

4.9.4.4 The permittee shall continue to develop public educational and participation materials in cooperation and coordination with other agencies and organizations in the District with similar responsibilities and objectives. Progress reports on public education shall be included in the Annual Report. An explanation shall be provided as to how this effort will reduce pollution loadings to meet the requirements of this permit.

4.9.4.5 The permittee shall periodically, and at least annually, update its website.

4.10 Total Maximum Daily Load (TMDL) Wasteload Allocation (WLA) Planning and Implementation

4.10.1 Anacostia River Watershed Trash TMDL Implementation

The permittee shall attain removal of 103,188 pounds of trash annually, as determined in the Anacostia River Watershed Trash TMDL, as a specific single-year measure by the fifth year of this permit term.

Reductions must be made through a combination of the following approaches:

1. Direct removal from waterbodies, e.g., stream clean-ups, skimmers
2. Direct removal from the MS4, e.g., catch basin clean-out, trash racks

3. Direct removal prior to entry to the MS4, e.g., street sweeping
4. Prevention through additional disposal alternatives, e.g., public trash/recycling collection
5. Prevention through waste reduction practices, regulations and/or incentives, e.g., bag fees

At the end of the first year the permittee must submit the trash reduction calculation methodology with Annual Report to EPA for review and approval. The methodology should accurately account for trash prevention/removal methods beyond those already established when the TMDL was approved, which may mean crediting a percentage of certain approaches. The calculation methodology must be consistent with assumptions for weights and other characteristics of trash, as described in the 2010 Anacostia River Watershed Trash TMDL.

Annual reports must include the trash prevention/removal approaches utilized, as well as the overall total weight (in pounds) of trash captured for each type of approach.

The requirements of this Section, and related elements as appropriate, shall be included in the Consolidated TMDL Implementation Plan (Section 4.10.3).

4.10.2 Hickey Run TMDL Implementation

The permittee shall implement and complete the proposed replacement/rehabilitation, inspection and enforcement, and public education aspects of the strategy for Hickey Run as described in the updated Plan to satisfy the requirements of the oil and grease wasteload allocations for Hickey Run. If monitoring or other assessment determine it to be necessary, the permittee shall install or implement appropriate controls to address oil & grease in Hickey Run no later than the end of this permit term. As appropriate, any requirement of this Section not completed prior to finalization of the Consolidated TMDL Implementation Plan (Section 4.10.3) shall be included in that Plan.

4.10.3 Consolidated TMDL Implementation Plan

For all TMDL wasteload allocations assigned to District MS4 discharges, the District shall develop, public notice and submit to EPA for review and approval a consolidated TMDL Implementation Plan within 2 years of the effective date of this permit. This Plan shall include, at a minimum, the following TMDLs and any subsequent updates:

1. TMDL for Biochemical Oxygen Demand (BOD) in the Upper and Lower Anacostia River (2001)
2. TMDL for Total Suspended Solids (TSS) in the Upper and Lower Anacostia River (2002)
3. TMDL for Fecal Coliform Bacteria in the Upper and Lower Anacostia River (2003)
4. TMDL for Organics and Metals in the Anacostia River and Tributaries (2003)
5. TMDL for Fecal Coliform Bacteria in Kingman Lake (2003)
6. TMDL for Total Suspended Solids, Oil and Grease and Biochemical Oxygen Demand in Kingman Lake (2003)

7. TMDL for Fecal Coliform Bacteria in Rock Creek (2004)
8. TMDL for Organics and Metals in the Tributaries to Rock Creek (2004)
9. TMDL for Fecal Coliform Bacteria in the Upper, Middle and Lower Potomac River and Tributaries (2004)
10. TMDL for Organics, Metals and Bacteria in Oxon Run (2004)
11. TMDL for Organics in the Tidal Basin and Washington Ship Channel (2004)
12. TMDL for Sediment/Total Suspended Solids for the Anacostia River Basin in Maryland and the District (2007) [pending resolution of court vacature, *Anacostia Riverkeeper, Inc. v. Jackson*, No. 09-cv-97 (RCL)]
13. TMDL for PCBs for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland and Virginia (2007)
14. TMDL for Nutrients/Biochemical Oxygen Demand for the Anacostia River Basin in Maryland and the District (2008)
15. TMDL for Trash for the Anacostia River Watershed, Montgomery and Prince George's Counties, Maryland and the District of Columbia (2010)
16. TMDL for Nitrogen, Phosphorus and Sediment for the Chesapeake Bay Watershed (2010)

This Plan shall place particular emphasis on the pollutants in Table 4, but shall also evaluate other pollutants of concern for which relevant WLAs exist. The District shall fully implement the Plan upon EPA approval. This Plan shall preempt any existing TMDL implementation plans for the relevant WLAs. For any new or revised TMDL approved during the permit term with wasteload allocations assigned to District MS4 discharges, the District shall update this Plan within six months and include a description of revisions in the next regularly scheduled annual report. The Plan shall include:

1. A specified schedule for compliance with each TMDL that includes numeric benchmarks that specify annual pollutant load reductions and the extent of control actions to achieve these numeric benchmarks.
2. Interim numeric milestones for TMDLs where final attainment of applicable waste load allocations requires more than one permit cycle. These milestones shall originate with the third year of this permit term and every five years thereafter.
3. Demonstration using modeling of how each applicable WLA will be attained using the chosen controls, by the date for ultimate attainment.
4. The Consolidated TMDL Implementation Plan elements required in this section will become enforceable permit terms upon approval of such Plans, including the interim and final dates in this section for attainment of applicable WLAs.
5. Where data demonstrate that existing TMDLs are no longer appropriate or accurate, the Plan shall include recommended solutions, including, if appropriate, revising or withdrawing TMDLs.

4.10.4 Adjustments to TMDL Implementation Strategies

If evaluation data, as outlined in the monitoring strategy being developed per Part 5.1, indicate insufficient progress towards attaining any WLA covered in 4.10.1, 4.10.2 or 4.10.3, the

permittee shall adjust its management programs within 6 months to address the deficiencies, and document the modifications in the Consolidated TMDL Implementation Plan. The Plan modification shall include a reasonable assurance demonstration of the additional controls to achieve the necessary reductions. Annual reports must include a description of progress as evaluated against all implementation objectives, milestones and benchmarks, as relevant, outlined in Part 4.10.

4.11 Additional Pollutant Sources

For any additional pollutant sources not addressed in sections 4.1 through 4.9, the permittee shall continue to compile pertinent information on known or potential pollution sources, including significant changes in:

1. land use activities,
2. population estimates,
3. runoff characteristics,
4. major structural controls,
5. landfills,
6. publicly owned lands, and
7. industries impacting the MS4.

For purposes of this section, “significant changes” are changes that have the potential to revise, enhance, modify or otherwise affect the physical, legal, institutional, or administrative characteristics of the above-listed potential pollution sources. This information shall be submitted in each of the Annual Reports submitted to EPA pursuant to the procedures in Part 6.2 herein. For the Stormwater Model, analysis of data for these pollution sources shall be reported according to Part 7 herein.

The permittee shall implement controls to minimize and prevent discharges of pollutants from additional pollutant sources, including but not limited to Bacteria (*E. coli*), Total Nitrogen, Total Phosphorus, Total Suspended Solids, Cadmium, Copper, Lead, Zinc, and Trash, to receiving waters. Controls shall be designed to prevent and restrict priority pollutants from coming into contact with stormwater, e.g., restricting the use of lawn fertilizers rather than end-of-pipe treatment. These strategies shall include program priorities and a schedule of activities to address those priorities and an outline of which agencies will be responsible for implementing those strategies. The strategies used to reduce or eliminate these pollutants shall be documented in updates to the Stormwater Management Program Plan.

5. **MONITORING AND ASSESSMENT OF CONTROLS**

5.1 Revised monitoring program

5.1.1 Design of the Revised Monitoring Program

Within two years of the effective date of this permit the District shall develop, public notice and submit to EPA for review and approval a revised monitoring program. The District shall fully implement the program upon EPA approval. The revised monitoring program shall meet the following objectives:

1. Make wet weather loading estimates of the parameters in Table 4 from the MS4 to receiving waters. Number of samples, sampling frequencies and number and locations of sampling stations must be adequate to ensure data are statistically significant and interpretable.
2. Evaluate the health of the receiving waters, to include biological and physical indicators such as macroinvertebrates and geomorphologic factors. Number of samples, frequencies and locations must be adequate to ensure data are statistically significant and interpretable for long-term trend purposes (not variation among individual years or seasons).
3. Include any additional necessary monitoring for purposes of source identification and wasteload allocation tracking. This strategy must align with the Consolidated TMDL Implementation Plan required in Part 4.10.3 For all pollutants in Table 4 monitoring must be adequate to determine if relevant WLAs are being attained within specified timeframes in order to make modifications to relevant management programs, as necessary.

Table 4
Monitoring Parameters

Parameter
<i>E. coli</i>
Total nitrogen
Total phosphorus
Total Suspended Solids
Cadmium
Copper
Lead
Zinc
Trash

4. All chemical analyses shall be performed in accordance with analytical methods approved under 40 C.F.R. Part 136. When there is not an approved analytical method, the applicant may use any suitable method as described in Section 5.7 herein, but must provide a description of the method.

5.1.2 Utilization of the Revised Monitoring Program)

The permittee must use the information to evaluate the quality of the stormwater program and the health of the receiving waters at a minimum to include:

1. The permittee shall estimate annual cumulative pollutant loadings for pollutants listed in Table 4. Pollutant loadings and, as appropriate, event mean concentrations, will be reported in DMRs and annual reports on TMDL implementation for pollutants listed in Table 4 in discharges from the monitoring stations in Table 5.
2. The permittee shall perform the following activities at least once during the permit term, but no later than the fourth year of this permit:
 - a. Identify and prioritize additional efforts needed to address water quality exceedances, and receiving stream impairments and threats;
 - b. Identify water quality improvements or degradation

Upon approval of the Revised Monitoring Program by EPA Region III, or 2 years from the effective date of this permit, whichever comes first, the permittee shall begin implementation of the Revised Monitoring Program.

5.2 Interim Monitoring

Until such time as EPA has approved the Revised Monitoring Program, the permittee shall implement the following monitoring program:

5.2.1 Wet Weather Discharge Monitoring

The permittee shall monitor for the parameters identified in Table 4 herein, at the locations listed in Table 5 herein. Monitoring frequency for chemical/physical parameters shall be taken by at least three times per year at a minimum. This does not include a geomorphologic assessment and/or physical habitat assessment. The permittee shall conduct sampling as provided in 40 C.F.R. § 122.21(g)(7).

The permittee shall monitor and provide an annual Discharge Monitoring Report for the period of interim monitoring.

TABLE 5
Monitoring Stations

A. Anacostia River Sub Watershed Monitoring Sites
1. Gallatin Street & 14 th Street N.E. across from the intersection of 14 th St. and Gallatin St. in

an outfall (MS-2)
2. Anacostia High School/Anacostia Recreation Center – Corner of 17 th St and Minnesota Ave SE
B. Rock Creek Subwatershed Monitoring Sites
1. Walter Reed -- Fort Stevens Drive -- 16 th Street and Fort Stevens Road, N.W. at an outfall (MS-6)
2. Soapstone Creek -- Connecticut Avenue and Ablemarle Street N.W. at an outfall (MS-5)
C. Potomac River Subwatershed Monitoring Sites
1. Battery Kemble Creek-49th and Hawthorne Streets, N.W. at an outfall (MS-4)
2. Oxon Run-Mississippi Avenue and 15 th Street, S.E. into Oxon Run via an outfall (MS-1)

The District may revise this list of sites in accordance with its revised monitoring program in Section 5.1 herein. Otherwise, changes to the above MS4 monitoring stations and/or sites for any reason shall be considered a major modification to the permit subject to the reopener clause.

During the interim monitoring period for the pollutants listed in Table 4, demonstration of compliance will be calculated using the procedures identified in the SWMP, the approved Anacostia River TMDL Implementation Plan, and/or other appropriate modeling tools and data on management practices efficiencies. The annual report will provide all monitoring data, and a brief synthesis of whether the data indicate that relevant wasteload allocations and other relevant targets are being achieved.

5.2.2 Storm Event Data

In addition to the parameters listed above, the permittee shall continue to maintain records of the date and duration (in hours) of the storm events sampled; rainfall measurements or estimates (in inches) of the storm event which generated the sampled runoff; the duration (in hours) between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and a calculated flow estimate of the total volume (in gallons) and nature of the discharge sampled.

5.2.3 Sample Type, Collection, and Analysis

The following requirements apply only to samples collected for Part 5.2.1, Representative Monitoring.

1. For discharges from holding ponds or other impoundments with a retention period greater than 24 hours, (estimated by dividing the volume of the detention pond by the estimated volume of water discharged during the 24 hours previous to the time that the sample is collected) a minimum of one sample shall be taken for pollutants listed in Table 4 including temperature, DO, pH and specific conductivity. For all parameters, data shall be reported for the entire event of the discharge pursuant to 40 C.F.R. § 122.26(d)(2)(iii).
2. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Samples may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge, with each aliquot being separated by a minimum period of fifteen minutes.
3. Analysis and collection of samples shall be done in accordance with the most recent EPA approved laboratory methods and procedures specified at 40 C.F.R. Part 136 and its subsequent amendments.

5.2.4 Sampling Waiver

When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event.

Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.).

5.3 Dry Weather Monitoring

5.3.1 Dry Weather Screening Program

The permittee shall continue with ongoing efforts to detect the presence of illicit connections and improper discharges to the MS4 pursuant to the District SWMP. The permittee shall perform the following: (1) continue to screen known problem sewersheds within the District based on past screening activities; (2) continue to inventory all MS4 outfalls in the District and inspect all outfalls by the end of the permit term; and (3) ensure that the dry weather screening program has addressed all watersheds within the permit term. The screening shall be sufficient to estimate the frequency and volume of dry weather discharges and their environmental impact.

5.3.2 Screening Procedures

Screening may be developed and/or modified based on experience gained during actual field screening activities. The permittee shall establish a protocol which requires screening to ensure that such procedures are occurring, but such protocol need not conform to the procedures published at 40 C.F.R. § 122.26(d)(1)(iv)(D). The permittee shall describe the protocol actually used in each Annual Report with a justification for its use. The procedures described in the SWMP shall be used as guidance.

5.3.3 Follow-up on Dry Weather Screening Results

The permittee shall continue to implement its enforcement program for locating and ensuring elimination of all suspected sources of illicit connections and improper disposal identified during dry weather screening activities. The permittee shall report the results of such implementation in each Annual Report.

5.4. Area and/or Source Identification Program

The permittee shall continue to implement a program to identify, investigate, and address areas and/or sources within its jurisdiction that may be contributing excessive levels of pollutants to the MS4 and receiving waters, including but not limited to those pollutants identified in Table 4 herein.

5.5 Flow Measurements

The permittee shall continue to select and use appropriate flow measurement devices and methods consistent with accepted scientific practices to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device.

5.6 Monitoring and Analysis Procedures

5.6.1 Monitoring must be conducted according to laboratory and test procedures approved under 40 C.F.R. Part 136 and subsequent amendments, unless other test procedures have been specified in the permit.

5.6.2 The permittee is authorized to use a more current or sensitive (i.e., lower) detection method than the one identified in 40 C.F.R. Part 136 exists for a particular parameter, including but not limited to PCBs (Method 1668B) and mercury (Method 1631E). If used, the permittee shall report using the more current and/or more sensitive method for compliance reporting and monitoring purposes.

5.6.3 EPA reserves the right to modify the permit in order to require a more sensitive method for measuring compliance with any pollutant contamination levels, consistent with 40 CFR, Part 136, should it become necessary.

5.7 Reporting of Monitoring Results

The permittee shall continue to report monitoring results annually in a Discharge Monitoring Report. If NetDMR (<http://www.epa.gov/netdmr/>) is unavailable to any of the following then the original and one copy of the Report are to be submitted at the following addresses:

NPDES Permits Branch
(3WP41)

U.S. EPA Region III
Water Protection Division
1650 Arch Street
Philadelphia, PA 19103-2029

National Marine Fisheries Service/Northeast Region
Protected Resource Division
55 Great Republic Drive

Gloucester, Massachusetts

01930-2276

Monitoring results obtained during the previous year shall be summarized and reported in the Annual Report.

5.8 Additional Monitoring by the Permittee

If the permittee monitors (for the purposes of this permit) any pollutant more frequently than required by this permit, using laboratory and test procedures approved under 40 C.F.R. Part 136 and subsequent amendments or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the annual Discharge Monitoring Report. Such frequency shall also be indicated.

5.9 Retention of Monitoring Information

The permittee shall continue to retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation for a period of at least five(5) years from the date of the sample, measurement or report. This period may be extended by request of EPA at any time.

5.10 Record Content

Records of monitoring information shall include:

1. The date, exact location, time and methods of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and

6. The results of such analyses.

6. REPORTING REQUIREMENTS

The permittee shall comply with the reporting requirements identified in this section, including but not limited to the deliverables identified in Table 6 below.

TABLE 6
Reporting Requirements

Submittal	Deadline
Discharge Monitoring Report	Each year on the anniversary of the effective date of the permit (AEDOP)
Annual Report	Each year on the AEDOP.
MS4 Permit Application	Six months prior to the permit expiration date.

6.1 Discharge Monitoring Reports

The permittee shall provide discharge monitoring reports per Part 5.7 of this permit on the quality of stormwater discharges from the MS4 for all analytical chemical monitoring stipulated in Part 5 of this permit.

6.2 Annual Reporting

The permittee shall submit an Annual Report to EPA on or by the effective yearly date of the permit for the duration of the permitting cycle. At the same time the Annual Report is submitted to EPA it shall also be posted on the District's website at an easily accessible location. If the annual report is subsequently modified per EPA approval (part 6.2.3 of this permit) the updated report shall be posted on the District's website.

6.2.1 Annual Report.

The Annual Report shall follow the format of the permit as written, address each permit requirement, and also include the following elements:

- a. A review of the status of program implementation and compliance (or non-compliance) with all provisions and schedules of compliance contained in this permit, including documentation as to compliance with performance standards and other provisions and deliverables contained in Section 4 herein;
- b. A review of monitoring data and any trends in estimated cumulative annual pollutant loadings, including TMDL WLAs and TMDL implementation activities;

- c. An assessment of the effectiveness of controls established by the SWMP;
- d. An assessment of the projected cost of SWMP implementation for the upcoming year (or longer) and a description of the permittee's budget for existing stormwater programs, including: (i) an overview of the permittee's financial resources and budget, (ii) overall indebtedness and assets, (iii) sources for funds for stormwater programs; and (iv) a demonstration of adequate fiscal capacity to meet the requirements of this permit, subject to the (a) the federal Anti-Deficiency Act, 31 U.S.C. §§ 1341, 1342, 1349, 1351, (b) the District of Columbia Anti-Deficiency Act, D.C. Official Code §§ 47-355.01-355.08 (2001), (c) D.C. Official Code § 47-105 (2001), and (d) D.C. Official Code § 1-204.46 (2006 Supp.), as the foregoing statutes may be amended from time to time;
- e. A summary describing the number and nature of enforcement actions, inspections, and public education programs and installation of control systems;
- f. Identification of water quality improvements or degradation through application of a measurable performance standard as stated throughout this permit;
- g. Results of storm and water quality modeling and its use in planning installation of control systems and maintenance and other activities;
- h. An assessment of any SWMP modifications needed to meet the requirements of this permit;
- i. Revisions, if necessary, to the assessments of controls and the fiscal analysis reported in the permit application under 40 C.F.R. § 122.26(d)(2)(iv) and (v);
- j. Methodology to assess the effects of the Stormwater Management Program (SWMP);
- k. Annual expenditures and budget for the year following each annual report;
- l. A summary of commitments for the next year and evaluation of the commitments from the previous year;
- m. A summary of the monitoring data for stormwater and ambient sampling that is collected in the previous year and the plan, including identification of monitoring locations, to collect additional data for the next year;
- n. The amount of impervious cover within the District, and within the three major watersheds in the District (Anacostia, Potomac and Rock Creek);
- o. The percentage of effective impervious cover reduced annually, including but not limited to the number and square footage of green roofs installed in the District, including the square footage of drainage managed by practices that meet the performance standard in 4.1.1; and
- p. An analysis of the work to be performed in the next successive year, including performance measures for those tasks. In the following year, progress with those performance measures shall be part of the Annual Report. The basis for each of the performance standards, which will be used as tools for evaluating environmental results and determining the success of each MS4 activity, shall be described incorporating an integrated program approach that considers all programs and projects which have a direct as well as an indirect affect on stormwater management quantity and quality within the District. The report shall also provide an update of the fiscal analysis for each year of the permit as required by 40 C.F.R. § 122.26(d)(2)(vi).

6.2.2 Annual Report Meeting

Within 12 months of the effective date of this permit the District shall convene an annual report meeting with EPA to present annual progress and plans for the following year. In conjunction with this meeting the annual written report may consist of presentation materials summarizing all required elements of the annual report rather than a lengthy written report, as long as all required elements are included. Following this first annual reporting meeting EPA and the District shall determine if the meeting and associated presentation materials constitute an effective reporting mechanism. With the agreement of both EPA and the District the annual reporting meeting and the use of summarized presentation materials in lieu of a lengthy written report may be extended for the remainder of the permit term.

6.2.3 Annual Report Revisions

Each Annual Report may be revised with written approval by EPA. The revised Report will become effective after its approval.

6.2.4 Signature and Certification

The permittee shall sign and certify the Annual Report in accordance with 40 C.F.R. §122.22(b), and include a statement or resolution that the permittee's governing body or agency (or delegated representative) has reviewed or been appraised of the content of such submissions. The permittee shall provide a description of the procedure used to meet the above requirement.

6.2.5 EPA Approval

In reviewing any submittal identified in Table 1 or 6, EPA may approve or disapprove each submittal. If EPA disapproves any submittal, EPA shall provide comments to the permittee. The permittee shall address such comments in writing within thirty (30) days of receipt of the disapproval from EPA. If EPA determines that the permittee has not adequately addressed the disapproval/comments, EPA may revise that submittal or portions of that submittal. Such revision by EPA is effective thirty (30) days from receipt by the permittee. Once approved by EPA, or in the event of EPA disapproval, as revised by EPA, each submission shall be an enforceable element of this permit.

6.3 MS4 Permit Application

The permittee develop a permit Application based on the findings presented in each of the Annual SWMP Reports submitted during the permitting cycle to be submitted six months prior to the expiration date of the permit. The permit application shall define the next iterative set of objectives for the program and provide an analysis to demonstrate that these objectives will be achieved in the subsequent permit term.

7. STORMWATER MODEL

The permittee shall continue to update and report all progress made in developing a Stormwater Model and Geographical Information System (GIS) to EPA on an annual basis as an attachment to each Annual Report required herein.

On an annual basis, the permittee shall report on pollutant load reductions throughout the area covered by this permit using the statistical model developed by DDOE or other appropriate model. In the annual update, the permittee shall include, at a minimum, other applicable components which are not only limited to those activities identified in Section 6 herein, but which are necessary to demonstrate the effectiveness of the permittee's Stormwater Management Program toward implementing a sustainable strategy for reducing stormwater pollution runoff to the impaired waters of the District of Columbia.

Assess performance of stormwater on-site retention projects through monitoring, modeling and/or estimating storm retention capacity to determine the volume of stormwater removed from the MS4 in a typical year of rainfall as a result of implementing stormwater controls. This provision does not require all practices to be individually monitored, only that a reasonable evaluation strategy must provide estimates of overall volume reductions by sewershed.

8. STANDARD PERMIT CONDITIONS FOR NPDES PERMITS

8.1 Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and may result in an enforcement action; permit termination, revocation and reissuance, or modification; and denial of a permit renewal application.

8.2 Inspection and Entry

The permittee shall allow EPA, or an authorized representative, and/or the District's contractor(s)/subcontractor(s), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises at reasonable times where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be maintained under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), processes, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

8.3 Civil and Criminal Penalties for Violations of Permit Conditions

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

The Clean Water Act provides that any person who violates Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act, or any permit condition or limitation implementing such section, or any requirement imposed in an approved pretreatment program and any person who violates any Order issued by EPA under Section 301(a) of the Act, shall be subject to a civil penalty not to exceed \$25,000 per day for each violation. Pursuant to the Civil Monetary Penalty Inflation Adjustment Rule, EPA has raised the statutory maximum penalty for such violations to \$37,500 per day for each such violation. 74 Fed. Reg. 626 (Jan. 7, 2009). The Clean Water Act also provides for an action for appropriate relief including a permanent or temporary injunction.

Any person who negligently violates Section 301, 302, 305, 307, 308, 318, or 405 of the Clean Water Act, any permit condition or limitation implementing any such section, shall be punished by a criminal fine of not less than \$5,000 nor more than \$50,000 per day of such violation, or by imprisonment for not more than 3 years, or by both. Any person who knowingly violates any permit condition or limitation implementing Section 301, 302, 305, 307, 308, 318, or 405 of the Clean Water Act, and who knows at the time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000, or by imprisonment of not more than 15 years, or by both.

8.4 Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

In the event that the permittee or permitting authority determines that discharges are causing or contributing to a violation of applicable WQS, the permittee shall take corrective action to eliminate the WQS exceedance or correct the issues and/or problems by requiring the party or parties responsible for the alleged violation(s) comply with Part I.C.1 (Limitations to Coverage) of this permit. The methods used to correct the WQS exceedances shall be documented in subsequent annual reports and in revisions to the Stormwater Management Program Plan.

8.5 Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this permit;
2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
3. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;
4. Information newly acquired by the Agency, including but not limited to the results of the studies, planning, or monitoring described and/or required by this permit;
5. Material and substantial facility modifications, additions, and/or expansions;
6. Any anticipated change in the facility discharge, including any new significant industrial discharge or changes in the quantity or quality of existing industrial discharges that will result in new or increased discharges of pollutants; or
7. A determination that the permitted activity endangers human health or the environment and that it can only be regulated to acceptable levels by permit modification or termination.

The effluent limitations expressed in this permit are based on compliance with the District of Columbia's water quality standards in accordance with the Clean Water Act. In the event of a revision of the District of Columbia's water quality standards, this document may be modified by EPA to reflect this revision.

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. When a permit is modified, only conditions subject to modification are reopened.

8.6 Retention of Records

The permittee shall continue to retain records of all documents pertinent to this permit not otherwise required herein, including but not limited copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the expiration date of this permit. This period may be extended by request of EPA at any time.

8.7 Signatory Requirements

All Discharge Monitoring Reports, plans, annual reports, certifications or information either submitted to EPA or that this permit requires be maintained by the permittee shall be signed by either a principal executive officer or ranking elected official, or a duly authorized representative of that person. A person is a duly authorized representative only if: (i) the

authorization is made in writing by a person described above and submitted to EPA; and (ii) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for an agency. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new notice satisfying the requirements of this paragraph must be submitted to EPA prior or together with any reports, information, or applications to be signed by an authorized representative.

8.8 Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act, 33 U.S.C. § 1321.

8.9 District Laws, Regulations and Ordinances

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable District law, regulation or ordinance identified in the SWMP. In the case of "exemptions and waivers" under District law, regulation or ordinance, Federal law and regulation shall be controlling.

8.10 Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

8.11 Severability

The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

8.12 Transfer of Permit

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the permit may be transferred to another person if:

1. The current permittee notifies the EPA, in writing of the proposed transfer at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and
3. The EPA does not notify the current permittee and the new permittee of intent to modify, revoke and reissue, or terminate the permit and require that a new application be submitted.

8.13 Construction Authorization

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

8.14 Historic Preservation

During the design stage of any project by the Government of the District of Columbia within the scope of this permit that may include ground disturbance, new and existing or retrofit construction, or demolition of a structure, the Government of the District of Columbia shall notify the Historic Preservation liaison and provide the liaison planning documents for the proposed undertaking. The documents shall include project location; scope of work or conditions; photograph of the area/areas to be impacted and the methods and techniques for accomplishing the undertaking. Depending on the complexity of the undertaking, sketches, plans and specifications shall also be submitted for review. The documentation will enable the liaison to assess the applicability of compliance procedures associated with Section 106 of the National Historic Preservation Act. Among the steps in the process are included:

1. The determination of the presence or absence of significant historic properties (architectural, historic or prehistoric). This can include the evaluation of standing structures and the determination of the need for an archaeological survey of the project area.
2. The evaluation of these properties in terms of their eligibility for nomination to the National Register of Historic Places.
3. The determination of the effect that the proposed undertaking will have on these properties.
4. The development of mitigating measures in conjunction with any anticipated effects.

All such evaluations and determinations will be presented to the Government of the District of Columbia for its concurrence.

If an alternate Historic Preservation procedure is approved by EPA in writing during the term of this permit, the alternate procedure will become effective after its approval.

8.15 Endangered Species

The U.S. Fish and Wildlife Service (FWS) has indicated that Hay's Spring Amphipod, a Federally listed endangered species, occurs at several locations in the District of Columbia. The National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) has indicated that the endangered shortnose sturgeon occurs in the Potomac River drainage and may occur within the District of Columbia. The FWS and NOAA Fisheries indicate that at the present time there is no evidence that the ongoing stormwater discharges covered by this permit are adversely affecting these Federally-listed species. Stormwater discharges, construction, or any other activity that adversely affects a Federally-listed endangered or threatened species are not authorized under the terms and conditions of this permit.

The monitoring required by this permit will allow further evaluation of potential effects on these threatened and endangered species once monitoring data has been collected and analyzed. EPA requires that the permittee submit to NOAA Fisheries, at the same time it submits to EPA, the Annual Outfall Discharge Monitoring Report of the monitoring data which will be used by EPA and NOAA Fisheries to further assess effects on endangered or threatened species. If this data indicates that it is appropriate, requirements of this NPDES permit may be modified to prevent adverse impacts on habitats of endangered and threatened species.

The above-referenced Report of monitoring data is required under this permit to be sent on an annual basis to:

The United States Environmental Protection Agency
Region III (3WP41)
Water Protection Division
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

National Marine Fisheries Service/Northeast Region
Protected Resource Division
55 Great Republic Drive
Gloucester, Massachusetts 01930-2276

8.16 Toxic Pollutants

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under section 307(a) of the Act, 33 U.S.C. § 1317(a), for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, the permittee shall comply with such standard or prohibition even if the permit has not yet been modified to comply with the requirement.

8.17 Bypass

8.17.1 Bypass not exceeding limitations. In accordance with 40 C.F.R. § 122.41(m), the permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation.

8.17.2 Notice

1. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it must submit prior notice at least ten days before the date of the bypass. See 40 C.F.R. § 122.41(m)(3)(i).
2. Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required by 40 C.F.R. § 122.41(l)(6) (24-hour notice). See 40 C.F.R. § 122.41(m)(3)(ii).

8.17.3 Prohibition of bypass. See 40 C.F.R. § 122.41(m)(4).

1. Bypass is prohibited, and EPA may take enforcement action against the permittee for bypass, unless:
 - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage as defined herein;
 - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - c. The permittee submitted notices as required herein.
2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above.

8.18 Upset

Effect of an upset: An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of 40 C.F.R. § 122.41(n) are met.

8.19 Reopener Clause for Permits

The permit may be modified or revoked and reissued, including but not limited to, any of the following reasons:

1. To incorporate any applicable effluent standard or limitation issued or approved under Sections 301, 304, or 307 of the Clean Water Act, and any other applicable provision, such as provided for in the Chesapeake Bay Agreements based on water quality considerations, and if the effluent standard or limitation so issued or approved:
 - a. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - b. Controls any pollutant not limited in the permit. The permit, as modified or reissued under this paragraph, shall also contain any other requirements of the Act then applicable; or
2. To incorporate additional controls that are necessary to ensure that the permit effluent limits are consistent with any applicable TMDL WLA allocated to the discharge of pollutants from the MS4; or
3. As specified in 40 C.F.R. §§ 122.44(c), 122.62, 122.63, 122.64, and 124.5.

8.20 Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, it must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit. EPA may grant permission to submit an application less than 180 days in advance but no longer than the permit expiration date. In the event that a timely and complete reapplication has been submitted and EPA is unable through no fault of the permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

9. PERMIT DEFINITIONS

Terms that are not defined herein shall have the meaning accorded them under section 502 of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, or its implementing regulations, 40 C.F.R. Part 122.

“Annual Report” refers to the consolidated Annual Report that the permittee is required to submit annually.

“Bypass” means the intentional diversion of waste streams from any portion of a treatment facility. See 40 C.F.R. § 122.41(m)(1)(i).

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (6-483 and Pub. L. 97-117, 33 U.S.C. §§ 1251 *et seq.*

"Development" is the undertaking of any activity that disturbs a surface area greater than or equal to 5,000 square feet, including new development projects and redevelopment projects. For purposes of Parts 4.1.1 through 4.1.4 of the permit the requirements apply to discharges from sites for which design or construction commenced after 18 months from the effective date of this permit or as required by District of Columbia law, whichever is sooner. The District may exempt development projects receiving site plan approval prior to this date from these requirements.

"Director" means the Regional Administrator of USEPA Region 3 or an authorized representative.

"Discharge" for the purpose of this permit, unless indicated otherwise, refers to discharges from the Municipal Separate Storm Sewer System (MS4).

"Discharge Monitoring Report", "DMR" or "Outfall Discharge Monitoring Report" includes the monitoring and assessment of controls identified in Section 5 herein.

"EPA" means USEPA Region 3.

"Green Roof" is a low-maintenance roof system that stores rainwater where the water is taken up by plants and/or transpired into the air.

"Green Technology Practices" means stormwater management practices that are used to mimic pre-development site hydrology by using site design techniques that retain stormwater on-site through infiltration, evapotranspiration, harvest and use.

"Guidance" means assistance in achieving a particular outcome or objective.

"Illicit connection" means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

"Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities, pursuant to 40 C.F.R. § 122.26(b)(2).

"Impaired Water" (or "Water Quality Impaired Water" or "Water Quality Limited Segment"): A water is impaired for purposes of this permit if it has been identified by the District or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards (these waters are called "water quality limited segments" under 40 C.F.R. 30.2(j)). Impaired waters include both waters with approved or established TMDLs, and those for which a TMDL has not yet been approved or established.

"Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit (i.e., an area where wastes are applied onto or incorporated into the soil surface [excluding manure spreading operations] for treatment or disposal), surface impoundment, injection well, or waste pile.

"Large or Medium municipal separate storm sewer system" means all municipal separate storm sewers that are either: (1) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 C.F.R. Part 122); or (2) located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 C.F.R. Part 122); or (3) owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

"MS4" refers to either a Large or Medium Municipal Separate Storm Sewer System.

"Municipal Separate Storm Sewer" means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (1) owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes; (2) Designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.); (3) not a combined sewer; and (4) not part of a Publicly-Owned Treatment Works as defined at 40 C.F.R. § 122.2.

"Offset" means a unit of measurement, either used as monetary or non-monetary compensation, as a substitute or replacement for mitigation of a stormwater control practice that has been determined to be impracticable to implement.

"Performance measure" means for purposes of this permit, a minimum set of criteria for evaluating progress toward meeting a standard of performance.

"Performance standard" means for purposes of this permit, a cumulative measure or provision for attainment of an outcome or objective.

"Permittee" refers to the Government of the District of Columbia and all subordinate District and independent agencies, such as the District of Columbia Water and Sewer Authority, directly accountable and responsible to the City Council and Mayor as authorized under the Stormwater Permit Compliance Amendment Act of 2000 and any subsequent amendments for administrating, coordinating, implementing, and managing stormwater for MS4 activities within the boundaries of the District of Columbia.

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other

floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

“Pollutant of concern” means a pollutant in an MS4 discharge that may cause or contribute to the violation of a water quality criterion for that pollutant downstream from the discharge.

“Pre-Development Condition” means the combination of runoff, infiltration and evapotranspiration rates, volumes, durations and temperatures that typically existed on the site with natural soils and vegetation before human-induced land disturbance occurred. In the context of requirements in this permit the environmental objective is a stable, natural hydrologic site condition that protects or restores to the degree relevant for that site, stable hydrology in the receiving water, which will not necessarily be the hydrologic regime of that receiving water prior to any human disturbance in the watershed.

“Retention” means the use of soils, vegetation, water harvesting and other mechanisms and practices to retain a target volume of stormwater on a given site through the functions of: pore space and surface ponding storage; infiltration; reuse, and/or evapotranspiration.

“Retrofit” means improvement in a previously developed area that results in reduced stormwater discharge volumes and pollutant loads and/or improvement in water quality over current conditions.

“Stormwater” means the flow of surface water which results from, and which occurs immediately following, a rainfall event, snow melt runoff, and surface runoff and drainage.

“Stormwater management” means (1) for quantitative control, a system of vegetative or structural measures, or both, which reduces the increased volume and rate of surface runoff caused by man-made changes to the land; and (2) for qualitative control, a system of vegetative, structural, and other measures which reduce or eliminate pollutants which might otherwise be carried by surface runoff.

“SWMP” is an acronym for Stormwater Management Program. For purposes of this permit, the term includes all stormwater activities described in the District’s SWMP Plan updated February 19, 2009, or any subsequent update, and all other strategies, plans, documents, reports, studies, agreements and related correspondences developed and used pursuant to the requirements of this permit.

“Severe property damage” means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 C.F.R. § 122.41(m)(1)(ii).

“Total Maximum Daily Load (TMDL) Units” means for purposes of this permit, the sum of individual waste load allocations (WLAs) and natural background. Unless specifically permitted otherwise in an EPA-approved TMDL report covered under the permit, TMDLs are expressed in

terms of mass per time, toxicity or other appropriate measure such as pollutant pounds of a total average annual load.

“TMDL Implementation Plan” means for purposes of this permit, a plan and subsequent revisions/updates to that plan that are designed to demonstrate how to achieve compliance with applicable waste load allocations as set forth in the permit requirements described in Section 8.1.4.

“Stormwater Management Program (SWMP)” is a modified and improved SWMP based on the existing SWMP and on information in each of the Annual Reports/Discharge Monitoring Reports. The purpose of the SWMP is to describe the list of activities that need to be done to meet the requirements of the Clean Water Act, an explanation as to why these activities will meet the Clean Water Act requirements, and a schedule for those activities.

“Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 C.F.R. § 122.41(n)(1).

“Waste pile” means any non-containerized accumulation of solid, nonflowing waste.

“Water quality standards” refers to the District of Columbia’s Surface and Ground Water Quality Standards codified at Code of District of Columbia Regulations §§ 21-1100 *et seq.*, which are effective on the date of issuance of the permit and any subsequent amendments which may be adopted during the life of this permit.

“Waters of the United States” is defined at 40 C.F.R. § 122.2.

ATTACHMENT 40

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

**Authorization to Discharge Under the
National Pollutant Discharge Elimination System**

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act",

**Ada County Highway District,
Boise State University,
City of Boise,
City of Garden City,
Drainage District #3,
and the Idaho Transportation Department District #3,

(hereinafter "the Permittees")**

are authorized to discharge from all municipal separate storm sewer system (MS4) outfalls existing as of the effective date of this Permit to waters of the United States, including the Boise River and its tributaries, in accordance with the conditions set forth herein.

This Permit will become effective February 1, 2013.

This Permit, and the authorization to discharge, expires at midnight, January 30, 2018.

Permittees must reapply for permit reissuance on or before August 3, 2017, 180 days before the expiration of this Permit, if the Permittees intend to continue operations and discharges from the MS4s beyond the term of this Permit.

Signed this 12th day of December, 2012.


Daniel D. Opalski, Director
Office of Water and Watersheds, Region 10
U.S. Environmental Protection Agency

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I. Applicability

A. Permit Area. This Permit covers all areas within the corporate boundary of the City of Boise and Garden City, Idaho, which are served by the municipal separate storm sewer systems (MS4s) owned or operated by the Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3, and/or the Idaho Transportation Department District #3 (the Permittees).

B. Discharges Authorized Under This Permit. Subject to the conditions set forth herein, the Permittees are authorized to discharge storm water to waters of the United States from the MS4s identified in Part I.A.

As provided in Part I.D, this Permit also authorizes the discharge of flows from the MS4s which are categorized as allowable non-storm water discharge, storm water discharge associated with industrial activity, and storm water discharge associated with construction activity.

C. Permittees' Responsibilities

1. **Individual Responsibility.** Each Permittee is individually responsible for Permit compliance related only to portions of the MS4 owned or operated solely by that Permittee, or where this Permit requires a specific Permittee to take an action.
2. **Joint Responsibility.** Each Permittee is jointly responsible for Permit compliance:
 - a) related to portions of the MS4 where operational or storm water management program (SWMP) implementation authority has been transferred to all of the Permittees in accordance with an intergovernmental agreement or agreement between the Permittees;
 - b) related to portions of the MS4 where Permittees jointly own or operate a portion of the MS4;
 - c) related to the submission of reports or other documents required by Parts II and IV of this Permit; and
 - d) Where this Permit requires the Permittees to take an action and a specific Permittee is not named.
3. **Intergovernmental Agreement.** The Permittees must maintain an intergovernmental agreement describing each organization's respective roles and responsibilities related to this Permit. Any previously signed agreement may be updated, as necessary, to comply with this requirement. An updated intergovernmental agreement must be completed no later than July 1, 2013. A copy of the updated intergovernmental agreement must be submitted to the Environmental Protection Agency (EPA) with the 1st Year Annual Report.

D. Limitations on Permit Coverage

1. **Non-Storm Water Discharges.** Permittees are not authorized to discharge non-storm water from the MS4, except where such discharges satisfy one of the following three conditions:
 - a) The non-storm water discharges are in compliance with a separate NPDES permit;
 - b) The non-storm water discharges result from a spill and:
 - (i) are the result of an unusual and severe weather event where reasonable and prudent measures have been taken to prevent and minimize the impact of such discharge; or
 - (ii) consist of emergency discharges required to prevent imminent threat to human health or severe property damage, provided that reasonable and prudent measures have been taken to prevent and minimize the impact of such discharges;

or

 - c) The non-storm water discharges satisfy each of the following two conditions:
 - (i) The discharges consist of uncontaminated water line flushing; potable water sources; landscape irrigation (provided all pesticides, herbicides and fertilizer have been applied in accordance with manufacturer's instructions); lawn watering; irrigation water; flows from riparian habitats and wetlands; diverted stream flows; springs; rising ground waters; uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20)) to separate storm sewers; uncontaminated pumped ground water or spring water; foundation and footing drains (where flows are not contaminated with process materials such as solvents); uncontaminated air conditioning or compressor condensate; water from crawlspace pumps; individual residential car washing; dechlorinated swimming pool discharges; routine external building wash down which does not use detergents; street and pavement wash waters, where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed); fire hydrant flushing; or flows from emergency firefighting activities; and
 - (ii) The discharges are not sources of pollution to waters of the United States. A discharge is considered a source of pollution to waters of the United States if it:
 - 1) Contains hazardous materials in concentrations found to be of public health significance or to impair beneficial uses in receiving waters. (Hazardous materials are those

that are harmful to humans and animals from exposure, but not necessarily ingestion);

- 2) Contains toxic substances in concentrations that impair designated beneficial uses in receiving waters. (Toxic substances are those that can cause disease, malignancy, genetic mutation, death, or similar consequences);
 - 3) Contains deleterious materials in concentrations that impair designated beneficial uses in receiving waters. (Deleterious materials are generally substances that taint edible species of fish, cause taste in drinking waters, or cause harm to fish or other aquatic life);
 - 4) Contains radioactive materials or radioactivity at levels exceeding the values listed in 10 CFR Part 20 in receiving waters;
 - 5) Contains floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or in concentrations that may impair designated beneficial uses in receiving waters;
 - 6) Contains excessive nutrients that can cause visible slime growths or other nuisance aquatic growths that impair designated beneficial uses in receiving waters;
 - 7) Contains oxygen-demanding materials in concentrations that would result in anaerobic water conditions in receiving waters; or
 - 8) Contains sediment above quantities specified in IDAPA 58.01.02.250.02.e or in the absence of specific sediment criteria, above quantities that impair beneficial uses in receiving waters; or
 - 9) Contains material in concentrations that exceed applicable natural background conditions in receiving waters (IDAPA 58.01.02.200.09). Temperature levels may be increased above natural background conditions when allowed under IDAPA 58.01.02.401.
2. **Discharges Threatening Water Quality.** Permittees are not authorized to discharge storm water that will cause, or have the reasonable potential to cause or contribute to, an excursion above the Idaho water quality standards.
3. **Snow Disposal to Receiving Waters.** Permittees are not authorized to push or dispose of snow plowed within the Permit area directly into waters of the United States, or directly into the MS4(s). Discharges from any Permittee's snow disposal and snow management practices are authorized under this Permit only when such sites and practices are designed, conducted, operated, and maintained to prevent and reduce pollutants in the discharges to the maximum

extent practicable so as to avoid excursions above the Idaho water quality standards.

4. **Storm Water Discharge Associated with Industrial and Construction Activity.** Permittees are authorized to discharge storm water associated with industrial activity (as defined in 40 CFR 122.26(b)(14)), and storm water associated with construction activity (as defined in 40 CFR 122.26(b)(14)(x) and (b)(15)), from their MS4s, only when such discharges are otherwise authorized under an appropriate NPDES permit.

II. Storm Water Management Program (SWMP) Requirements

A. General Requirements

1. **Reduce pollutants to the maximum extent practicable.** The Permittees must implement and enforce a SWMP designed to reduce the discharge of pollutants from their MS4 to the maximum extent practicable (MEP), and to protect water quality in receiving waters. The SWMP as defined in this Permit must include best management practices (BMPs), controls, system design, engineering methods, and other provisions appropriate to control and minimize the discharge of pollutants from the MS4s.
 - a) **SWMP Elements.** The required SWMP control measures are outlined in Part II.SWMP assessment/monitoring requirements are described in Part IV. Each Permittee must use practices that are selected, implemented, maintained, and updated to ensure that storm water discharges do not cause or contribute to an exceedance of an applicable Idaho water quality standard.
 - b) **SWMP Documentation.** Each Permittee must prepare written documentation of the SWMP as implemented within their jurisdiction. The SWMP documentation must be organized according to the program components in Parts II and IV of this Permit, and must provide a current narrative physical description of the Permittee's MS4, illustrative maps or graphics, and all related ordinances, policies and activities as implemented within their jurisdiction. Each Permittee's SWMP documentation must be submitted to EPA with the 1st Year Annual Report.
 - (i) Each Permittee must provide an opportunity for public review and comment on their SWMP documentation, consistent with applicable state or local requirements and Part II.B.6 of this Permit.
 - (ii) Each Permittee's SWMP documentation must be updated at least annually and submitted as part of each subsequent Annual Report. (The document format used for Annual Report(s) submitted to EPA by the Permittees' prior to the effective date of this Permit may be modified to meet this requirement.)
 - c) **SWMP Information.** The SWMP must include an ongoing program for gathering, tracking, maintaining, and using information to set priorities, evaluate SWMP implementation and Permit compliance.

- d) **SWMP Statistics.** Permittees must track the number of inspections, official enforcement actions and types of public education activities and outcomes as stipulated by the respective program component. This information must be included in the Annual Report.
2. **Shared Implementation with outside entities.** Implementation of one or more of the SWMP minimum control measures may be shared with or delegated to another entity other than the Permittee(s). A Permittee may rely on another entity only if:
 - a) The other entity, in fact, implements the minimum control measure;
 - b) The action, or component thereof, is at least as stringent as the corresponding Permit requirement; and
 - c) The other entity agrees to implement the minimum control measure on the Permittee's behalf. A binding written acceptance of this obligation is required. Each Permittee must maintain and record this obligation as part of the SWMP documentation. If the other entity agrees to report on the minimum control measure, the Permittees must supply the other entity with the reporting requirements in Part IV.C of this Permit. The Permittees remain responsible for compliance with the Permit obligation if the other entity fails to implement the required minimum control measure.
 3. **Modification of the SWMP.** Minor modifications to the SWMP may be made in accordance with Part II.E of this Permit.
 4. **Subwatershed Planning.** No later than September 30, 2016, the Permittees must jointly complete at least two individual sub-watershed plans for areas served by the MS4s within the Permit area. For the purposes of this Permit, the terms "subwatershed" and "storm sewershed" are defined as in Part VII. For each plan document, the subwatershed planning area must drain to at least one of the water bodies listed in Table II.C.

Selected subwatersheds must be identified in the 1st Year Annual Report. Two completed subwatershed plan documents must be submitted to EPA as part of the 4th Year Annual Report.

- a) The Permittees must actively engage stakeholders in the development of each plan, and must provide opportunities for public input, consistent with Part II.B.6.
- b) The Permittees may modify and update any existing watershed planning document(s) to address the requirements of this Part.
- c) Each subwatershed plan must describe the extent and nature of the existing storm sewershed, and identify priority aquatic resources and beneficial uses to be protected or restored within the subwatershed planning area. Each subwatershed plan must contain a prioritized list of potential locations or opportunities for protecting or restoring such resources or beneficial uses through storm water infiltration, evapotranspiration or rainfall

harvesting/reuse, or other site-based low impact development (LID) practices. See Parts II.B.2.a, and II.B.2.c.

- d) Each subwatershed plan must include consideration and discussion of how the Permittees will provide incentives, or enforce requirements, through their respective Stormwater Management Programs to address the following principles:
- (i) Minimize the amount of impervious surfaces (roads, parking lots, roofs) within each watershed, by minimizing the creation, extension and widening of roads and associated development.
 - (ii) Preserve, protect, create and restore ecologically sensitive areas that provide water quality benefits and serve critical watershed functions. These areas may include, but are not limited to; riparian corridors, headwaters, floodplains and wetlands.
 - (iii) Prevent or reduce thermal impacts to water bodies, including requiring vegetated buffers along waterways, and disconnecting discharges to surface waters from impervious surfaces such as parking lots.
 - (iv) Seek to avoid or prevent hydromodification of streams and other water bodies caused by development, including roads, highways, and bridges.
 - (v) Preserve and protect trees, and other vegetation with important evapotranspirative qualities.
 - (vi) Preserve and protect native soils, prevent topsoil stripping, and prevent compaction of soils.

B. Minimum Control Measures. The following minimum control measures must be accomplished through each Permittee's Storm Water Management Program:

1. **Construction Site Runoff Control Program.** The Permittees must implement a construction site runoff control program to reduce discharges of pollutants from public and private construction activity within its jurisdiction. The Permittees' construction site management program must include the requirements described below:
 - a) **Ordinance and/or other regulatory mechanism.** To the extent allowable under local or state law, Permittees must adopt, implement, and enforce requirements for erosion controls, sediment controls, and materials management techniques to be employed and maintained at each construction project from initial clearing through final stabilization. Each Permittee must require construction site operators to maintain adequate and effective controls to reduce pollutants in storm water discharges from construction sites. The Permittees must use enforcement actions (such as, written warnings, stop work orders or fines) to ensure compliance.

No later than September 30, 2015, each Permittee must update their ordinances or other regulatory mechanisms, as necessary, to be consistent with this Permit and with the current version of the *NPDES General Permit for Storm Water Discharges from Construction Activities*, Permit #IDR12-0000 (NPDES Construction General Permit or CGP).

- b) **Manuals Describing Construction Storm Water Management Controls and Specifications.** The Permittees must require construction site operators within their jurisdiction to use construction site management controls and specifications as defined within manuals adopted by the Permittees.

No later than September 30, 2015, the Permittees must update their respective manuals, as necessary, to include requirements for the proper installation and maintenance of erosion controls, sediment controls, and material containment/pollution prevention controls during all phases of construction activity. The manual(s) must include all acceptable control practices, selection and sizing criteria, illustrations, and design examples, as well as recommended operation and maintenance of each practice. At a minimum, the manual(s) must include requirements for erosion control, sediment control, and pollution prevention which complement and do not conflict with the current version of the CGP. If the manuals previously adopted by the individual Permittee do not meet these requirements, the Permittee may create supplemental provisions to include as part of the adopted manual in order to comply with this Permit.

- c) **Plan Review and Approval.** The Permittees must review and approve preconstruction site plans from construction site operators within their jurisdictions. Permittees must ensure that the construction site operator is prohibited from commencing construction activity prior to receipt of written approval.
- (i) The Permittees must not approve any erosion and sediment control (ESC) plan or Storm Water Pollution Prevention Plan (SWPPP) unless it contains appropriate site-specific construction site control measures meeting the Permittee's requirements as outlined in Part II.B.1.b.
 - (ii) Prior to the start of a construction project disturbing one or more acres, or disturbing less than one acre but is part of a larger common plan of development, the Permittees must advise the construction site operator(s) to seek or obtain necessary coverage under the NPDES Construction General Permit.
 - (iii) Permittees must use qualified individuals, knowledgeable in the technical review of ESC plans/SWPPPs, to conduct such reviews.
 - (iv) Permittees must document the review of each ESC plan and/or SWPPP using a checklist or similar process.
- d) **Construction Site Inspections.** The Permittees must inspect construction sites occurring within their jurisdictions to ensure compliance with their

applicable requirements. The Permittees may establish an inspection prioritization system to identify the frequency and type of inspection based upon such factors as project type, total area of disturbance, location, and potential threat to water quality. If a prioritization system is used, the Permittee must include a description of the current inspection prioritization in the SWMP document required in Part II.A, and summarize the nature and number of inspections conducted during the previous reporting period in each Annual Report.

(i) Inspections of construction sites must include, but not be limited to:

- As applicable, a check for coverage under the Construction General Permit by reviewing any authorization letter or Notice of Intent (NOI) during initial inspections;
- Review the applicable ESC plan/SWPPP to determine if control measures have been installed, implemented, and maintained as approved;
- Assessment of compliance with the Permittees' ordinances/requirements related to storm water runoff, including the implementation and maintenance of required control measures;
- Assessment of the appropriateness of planned control measures and their effectiveness;
- Visual observation of non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff;
- Education or instruction related to on storm water pollution prevention practices, as needed or appropriate; and
- A written or electronic inspection report.

(ii) The Permittees must track the number of construction site inspections conducted throughout the reporting period, and verify that the sites are inspected at the minimum frequencies required by the inspection prioritization system. Construction site inspections must be tracked and reported with each Annual Report.

(iii) Based on site inspection findings, each Permittee must take all necessary follow-up actions (i.e., re-inspection, enforcement) to ensure compliance. Follow-up and enforcement actions must be tracked and reported with each Annual Report.

- e) **Enforcement Response Policy for Construction Site Management Program.** No later than September 30, 2016, each Permittee must develop and implement a written escalating enforcement response policy (ERP) appropriate to their organization. Upon implementation of the policy in its jurisdiction, each Permittee must submit its completed ERP to EPA with the 4th Year Annual Report. The ERP for City of Boise, City of Garden City, and Ada County Highway District must address enforcement of construction site runoff controls for all currently regulated construction projects within their jurisdictions. The ERP for Idaho Transportation Department District 3, Drainage District 3, and Boise State University must address contractual enforcement of construction site runoff controls at construction sites within their jurisdictions. Each ERP must describe the Permittee's potential responses to violations with an appropriate educational or enforcement response. The ERP must address repeat violations through progressively stricter responses as needed to achieve compliance. Each ERP must describe how the Permittee will use the following types of enforcement response, as available, based on the type of violation:
- (i) **Verbal Warnings:** Verbal warnings are primarily consultative in nature. At a minimum, verbal warnings must specify the nature of violation and required corrective action.
 - (ii) **Written Notices:** Written notices must stipulate the nature of the violation and the required corrective action, with deadlines for taking such action.
 - (iii) **Escalated Enforcement Measures:** The Permittees must have the legal ability to employ any combination of the enforcement actions below (or their functional equivalent):
 - The ERP must indicate when the Permittees will initiate a Stop Work Order. Stop work orders must require that construction activities be halted, except for those activities directed at cleaning up, abating discharge, and installing appropriate control measures.
 - The Permittees must also use other escalating measures provided under local or state legal authorities, such as assessing monetary penalties. The Permittees may perform work necessary to improve erosion control measures and collect the funds from the responsible party in an appropriate manner, such as collecting against the project's bond, or directly billing the responsible party to pay for work and materials.
- f) **Construction General Permit Violation Referrals.** For those construction projects which are subject to the NPDES Construction General Permit and do not respond to Permittee educational efforts, the Permittee may provide to EPA information regarding construction project operators which cannot demonstrate that they have appropriate NPDES Permit

coverage and/or site operators deemed by the Permittee as not complying with the NPDES Construction General Permit. Permittees may submit such information to the EPA NPDES Compliance Hotline in Seattle, Washington, by telephone, at (206) 553-1846, and include, at a minimum, the following information:

- Construction project location and description;
 - Name and contact information of project owner/ operator;
 - Estimated construction project disturbance size; and
 - An account of information provided by the Permittee to the project owner/ operator regarding NPDES filing requirements.
- (i) **Enforcement Tracking.** Permittees must track instances of non-compliance either in hard-copy files or electronically. The enforcement case documentation must include, at a minimum, the following:
- Name of owner/operator;
 - Location of construction project;
 - Description of violation;
 - Required schedule for returning to compliance;
 - Description of enforcement response used, including escalated responses if repeat violations occur;
 - Accompanying documentation of enforcement response (e.g., notices of noncompliance, notices of violations, etc.); and
 - Any referrals to different departments or agencies.
- g) **Construction Program Education and Training.** Throughout the Permit term, the Permittees must ensure that all staff whose primary job duties are related to implementing the construction program (including permitting, plan review, construction site inspections, and enforcement) are trained to conduct such activities. The education program must also provide regular training opportunities for construction site operators. This training must include, at a minimum:
- (i) *Erosion and Sediment Control/Storm Water Inspectors:*
- Initial training regarding proper control measure selection, installation and maintenance as well as administrative requirements such as inspection reporting/tracking and the implementation of the enforcement response policy; and

- Annual refresher training for existing inspection staff to update them on preferred BMPs, regulation changes, Permit updates, and policy or standards updates.
- (ii) *Other Construction Inspectors:* Initial training on general storm water issues, basic control measure implementation information, and procedures for notifying the appropriate personnel of noncompliance.
- (iii) *Plan Reviewers:*
- Initial training regarding control measure selection, design standards, review procedures;
 - Annual training regarding new control measures, innovative approaches, Permit updates, regulation changes and policy or standard updates.
- (iv) *Third-Party Inspectors and Plan Reviewers.* If the Permittee utilizes outside parties to either conduct inspections and or review plans, these outside staff must be trained per the requirements listed in Part II.B.1.f.i.-iii above.
- (v) *Construction Operator Education.* At a minimum, the Permittees must educate construction site operators within the Permit area as follows:
- At least once per year, the Permittees must either provide information to all construction companies on existing training opportunities or develop new training for construction operators regarding appropriate selection, installation, and use of required construction site control measures at sites within the Permit area.
 - The Permittees must require construction site operators to have at least one person on-site during construction that is appropriately trained in erosion and sediment control.
 - The Permittees must require construction operators to attend training at least once every three years.
 - The Permittees must provide appropriate information and outreach materials to all construction operators who may disturb land within their jurisdiction.

2. Storm Water Management for Areas of New Development and

Redevelopment. At a minimum, the Permittees must implement and enforce a program to control storm water runoff from new development and redevelopment projects that result in land disturbance of 5,000 square feet or more, excluding individual one or two family dwelling development or redevelopment. This program must apply to private and public sector development, including roads and streets. The program implemented by the Permittees must ensure that permanent controls or practices are utilized at each new development and redevelopment site to protect water quality. The program must include, at a minimum, the elements described below:

- a) **Ordinance or other regulatory mechanisms.** No later than the expiration date of this Permit, each Permittee must update its applicable ordinance or regulatory mechanism which requires the installation and long-term maintenance of permanent storm water management controls at new development and redevelopment projects. Each Permittee must update their ordinance/regulatory mechanism to the extent allowed by local and state law, consistent with the individual Permittee's respective legal authority. Permittees must submit their revised ordinance/regulatory mechanism as part of the 5th Year Annual Report.
 - (i) The ordinance/regulatory mechanism must include site design standards for all new and redevelopment that require, in combination or alone, storm water management measures that keep and manage onsite the runoff generated from the first 0.6 inches of rainfall from a 24-hour event preceded by 48 hours of no measureable precipitation. Runoff volume reduction can be achieved by canopy interception, soil amendments, bioretention, evapotranspiration, rainfall harvesting, engineered infiltration, extended filtration, and/or any combination of such practices that will capture the first 0.6 inches of rainfall. An Underground Injection Control permit may be required when certain conditions are met. The ordinance or regulatory mechanism must require that the first 0.6 inches of rainfall be 100% managed with no discharge to surface waters, except when the Permittee chooses to implement the conditions of II.B.2.a.ii below.
 - (ii) For projects that cannot meet 100% infiltration/evapotranspiration/reuse requirements onsite, the Permittees' program may allow offsite mitigation within the same subwatershed, subject to siting restrictions established by the Permittee. The Permittee allowing this option must develop and apply criteria for determining the circumstances under which offsite mitigation may be allowed. A determination that the onsite retention requirement cannot be met must be based on multiple factors, including but not limited to technical feasibility or logistic practicality (e.g. lack of available space, high groundwater, groundwater contamination, poorly infiltrating soils, shallow bedrock, and/or a land use that is inconsistent with

capture and reuse or infiltration of storm water). Determinations may not be based solely on the difficulty and/or cost of implementing such measures. The Permittee(s) allowing this option must create an inventory of appropriate mitigation projects and develop appropriate institutional standards and management systems to value, estimate and track these situations. Using completed subwatershed plans or other mechanisms, the Permittee(s) must identify priority areas within subwatersheds in which off-site mitigation may be conducted.

- (iii) The ordinance or regulatory mechanism must include the following water quality requirements:
- Projects with potential for excessive pollutant loading(s) must provide water quality treatment for associated pollutants before infiltration.
 - Projects with potential for excessive pollutant loading(s) that cannot implement adequate preventive or water quality treatment measures to ensure compliance with Idaho surface water standards must properly convey storm water to a NPDES permitted wastewater treatment facility or via a licensed waste hauler to a permitted treatment and disposal facility.
- (iv) The ordinance or other regulatory mechanism must include procedures for the Permittee's review and approval of permanent storm water management plans for new development and redevelopment projects consistent with Part II.B.1.d.
- (v) The ordinance or other regulatory mechanism must include sanctions (including fines) to ensure compliance, as allowed under state or local law.
- b) **Storm Water Design Criteria Manual.** No later than September 30, 2015, each Permittee must update as necessary their existing Storm Water Design Criteria Manual specifying acceptable permanent storm water management and control practices. The manual must contain design criteria for each practice. In lieu of updating a manual, a Permittee may adopt a manual created by another entity which complies with this section. The manual must include:
- (i) Specifications and incentives for the use of site-based practices appropriate to local soils and hydrologic conditions;
 - (ii) A list of acceptable practices, including sizing criteria, performance criteria, design examples, and guidance on selection and location of practices; and
 - (iii) Specifications for proper long term operation and maintenance, including appropriate inspection interval and self-inspection checklists for responsible parties.

- c) **Green Infrastructure/Low Impact Development (LID) Incentive Strategy and Pilot Projects.** No later than September 30, 2015, the Permittees must develop a strategy to provide incentives for the increased use of LID techniques in private and public sector development projects within each Permittee's jurisdiction. Permittees must comply with applicable State and local public notice requirements when developing this Strategy. Pursuant to Part IV.A.2.a, the Strategy must reference methods of evaluating at least three (3) Green Infrastructure/LID pilot projects as described below. Permittees must implement the Green Infrastructure/LID Incentive Strategy, and complete an effectiveness evaluation of at least three pilot projects, prior to the expiration date of this Permit.
- (i) As part of the 3rd Year Annual Report, the Permittees must submit the written Green Infrastructure /LID Incentive Strategy; the Strategy must include a description of at least three selected pilot projects, and a narrative report on the progress to evaluate the effectiveness of each selected LID technique or practice included in the pilot project. Each pilot project must include an evaluation of the effectiveness of LID technique(s) or practice(s) used for on-site control of water quality and/or quantity. Each Pilot Project must involve at least one or more of the following characteristics:
- The project manages runoff from at least 3,000 square feet of impervious surface;
 - The project involves transportation related location(s) (including parking lots);
 - The drainage area of the project is greater than five acres in size; and/or
 - The project involves mitigation of existing storm water discharges to one or more of the water bodies listed in Table II.C.
- (ii) Consistent with Part IV.A.10, the Permittees must evaluate the performance of LID technique(s) or practice(s) in each pilot project, and include a progress report on overall strategy implementation in the 4th Annual Report. Final pilot project evaluations must be submitted in the 5th Year Annual Report. The Permittees must monitor, calculate or model changes in runoff quantities for each of the pilot project sites in the following manner:
- For retrofit projects, changes in runoff quantities shall be calculated as a percentage of 100% pervious surface before and after implementation of the LID technique(s) or practice(s).
 - For new construction projects, changes in runoff quantities shall be calculated for development scenarios both with LID technique(s) or practice(s) and without LID technique(s) or practice(s).

- The Permittees must measure runoff flow rate and subsequently prepare runoff hydrographs to characterize peak runoff rates and volumes, discharge rates and volumes, and duration of discharge volumes. The evaluation must include quantification and description of each type of land cover contributing to surface runoff for each pilot project, including area, slope, vegetation type and condition for pervious surfaces, and the nature of impervious surfaces.
 - The Permittees must use these runoff values to evaluate the overall effectiveness of various LID technique(s) or practice(s) and to develop recommendations for future adoption of LID technique(s) or practice(s) that address appropriate use, design, type, size, soil type and operation and maintenance practices.
- (iii) **Riparian Zone Management and Outfall Disconnection.** No later than September 30, 2015, the Permittees must identify and prioritize riparian areas appropriate for Permittee acquisition and protection. Prior to the expiration date of this Permit, the Permittees must undertake and complete at least one project designed to reduce the flow of untreated urban storm water discharging through the MS4 system through the use of vegetated swales, storm water treatment wetlands and/or other appropriate techniques. The Permittees must submit the list of prioritized riparian protection areas, and a status report on the planning and implementation of the outfall disconnection project, as part of the 3rd Year Annual Report. Documentation of the completed outfall disconnection project must be included in the 5th Year Annual Report.
- (iv) **Repair of Public Streets, Roads and Parking Lots.** When public streets, roads or parking lots are repaired (as defined in Part VII), the Permittees performing these repairs must evaluate the feasibility of incorporating runoff reduction techniques into the repair by using canopy interception, bioretention, soil amendments, evaporation, rainfall harvesting, engineered infiltration, rain gardens, infiltration trenches, extended filtration and/or evapotranspiration and/or any combination of the aforementioned practices. Where such practices are found to be technically feasible, the Permittee performing the repair must use such practices in the design and repair. These requirements apply only to projects whose design process is started after the effective date of this Permit. As part of the 5th Year Annual Report, the Permittees must list the locations of street, road and parking lot repair work completed since the effective date of the Permit that have incorporated such runoff reduction practices, and the receiving water body(s) benefitting from such practices. This documentation must include a general description of the project design, estimated total cost, and estimates of total flow

volume and pollutant reduction achieved compared to traditional design practices.

- d) **Plan Review and Approval.** The Permittees must review and approve pre-construction plans for permanent storm water management. The Permittees must review plans for consistency with the ordinance/regulatory mechanism and Storm Water Design Criteria Manual required by this Part. The Permittees must ensure that the project operator is prohibited from commencing construction activity prior to receipt of written approval from the Permittee.
- (i) The Permittees must not approve or recommend for approval any plans for permanent storm water controls that do not contain appropriate permanent storm water management practices that meet the minimum requirements specified in this Part.
 - (ii) Permittees must use qualified individuals, knowledgeable in the technical review of plans for permanent storm water controls to conduct such reviews.
 - (iii) Permittees must document the review of each plan using a checklist or similar process.
- e) **Operation and Maintenance (O&M) of Permanent Storm Water Management Controls.**
- (i) **Inventory and Tracking.** The Permittees must maintain a database tracking all new public and private sector permanent storm water controls. No later than January 30, 2018, all of the available data on existing permanent storm water controls known to the Permittees must be included in the inventory database. For the purposes of this Part, new permanent controls are those installed after February 1, 2013; existing permanent controls are those installed prior to February 1, 2013. The tracking must begin in the plan review stage with a database that incorporates geographic information system (GIS) information. The tracking system must also include, at a minimum: type and number of practices; O&M requirements, activity and schedule; responsible party; and self-inspection schedule.
 - (ii) **O&M Agreements.** Where parties other than the Permittees are responsible for operation and maintenance of permanent storm water controls, the Permittees must require a legally enforceable and transferable O&M agreement with the responsible party, or other mechanism, that assigns permanent responsibility for maintenance of structural or treatment control storm water management practices.
- f) **Inspection and Enforcement of Permanent Storm Water Management Controls.** The Permittees must ensure proper long term operation and

maintenance of all permanent storm water management practices within the Permittees' respective jurisdiction. The Permittees must implement an inspection program, and define and prioritize new development and redevelopment sites for inspections of permanent storm water management controls. Factors used to prioritize sites must include, but not be limited to: size of new development or redevelopment area; sensitivity and/or impaired status of receiving water(s); and, history of non-compliance at the site during the construction phase.

- (i) No later than September 30, 2017, all high priority locations must be inventoried and associated inspections must be scheduled to occur at least once annually. The inspections must determine whether storm water management or treatment practices have been properly installed (i.e., an "as built" verification). The inspections must evaluate the operation and maintenance of such practices, identify deficiencies and potential solutions, and assess potential impacts to receiving waters.
 - (ii) No later than September 30, 2017, the Permittees must develop checklists to be used by inspectors during these inspections, and must maintain records of all inspections conducted on new development and redevelopment sites.
 - (iii) No later than September 30, 2017, the Permittees must develop and implement an enforcement strategy similar to that required in Section II.B.1.e to maintain the integrity of permanent storm water management and treatment practices.
- g) **Education and Training on Permanent Storm Water Controls.** No later than September 30, 2015, the Permittees must begin a training program for appropriate audiences regarding the selection, design, installation, operation and maintenance of permanent storm water controls. The training program and materials must be updated as necessary to include information on updated or revised storm water treatment standards, design manual specifications, Low Impact Development techniques or practices, and proper operation and maintenance requirements.
- (i) No later than September 30, 2016, and annually thereafter, all persons responsible for reviewing plans for new development and redevelopment and/or inspecting storm water management practices and treatment controls must receive training sufficient to determine the adequacy of storm water management and treatment controls at proposed new development and redevelopment sites.
 - (ii) No later than September 30, 2016, and at least annually thereafter, Permittees must provide training to local audiences on the storm water management requirements described in this Part.

3. Industrial and Commercial Storm Water Discharge Management. The Permittees must implement a program to reduce to the MEP the discharge of pollutants from industrial and commercial operations within their jurisdiction. Throughout the Permit term, the Permittees must conduct educational and/or enforcement efforts to reduce the discharge of pollutants from those industrial and commercial locations which are considered to be significant contributors of phosphorus, bacteria, temperature, and/or sediment to receiving waters. At a minimum, the program must include the following elements:

- a) **Inventory of Industrial and Commercial Facilities/Activities.** No later than September 30, 2016, the Permittees must update the inventory and map of facilities and activities discharging directly to their MS4s.
 - (i) At a minimum, the inventory must include information listing the watershed/receiving water body, facility name, address, nature of business or activity, and North American or Standard Industrial Classification code(s) that best reflect the facility's product or service;
 - (ii) The inventory must include the following types of facilities: municipal landfills (open and closed); Permittee-owned maintenance yards and facilities; hazardous waste recovery, treatment, storage and disposal facilities; facilities subject to Section 313 of the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. 11023; all industrial sectors listed in 40 CFR §122.26(b)(14); vehicle or equipment wash systems; commercial animal facilities, including kennels, race tracks, show facilities, stables, or other similar commercial locations where improper management of domestic animal waste may contribute pollutants to receiving waters or to the MS4; urban agricultural activities; and other industrial or commercial facility that the Permittees determine is contributing a substantial pollutant loading to the MS4 and associated receiving waters.
 - (iii) The Permittees must collectively identify at least two specific industrial/commercial activities or sectors operating within the Permit area for which storm water discharges are not being adequately addressed through existing programs. No later than September 30, 2016, the Permittees must develop best management practices for each activity, and educate the selected industrial/commercial audiences regarding these performance expectations. Example activities for consideration include, but are not limited to: landscaping businesses; wholesale or retail agricultural and construction supply businesses; urban agricultural activities; power washers; commercial animal facilities; commercial car/truck washing operations; and automobile repair shops.
- b) **Inspection of Industrial and Commercial Facilities/Activities.** The Permittees must work cooperatively throughout the Permit term to prioritize

and inspect selected industrial and commercial facilities/activities which discharge to receiving waters or to the MS4. No later than September 30, 2016, any existing agreements between the Permittees to accomplish such inspections must be updated as necessary to comply with this permit. At a minimum, the industrial and commercial facility inspection program must include:

- (i) Priorities and procedures for inspections, including inspector training, and compliance assistance or education materials to inform targeted facility/activity operators of applicable requirements;
 - (ii) Provisions to record observations of a facility or activity;
 - (iii) Procedures to report findings to the inspected facility or activity, and to follow-up with the facility/activity operator as necessary;
 - (iv) A monitoring (or self monitoring) program for facilities that assesses the type and quantity of pollutants discharging to the MS4s;
 - (v) Procedures to exercise legal authorities to ensure compliance with applicable local storm water ordinances.
- c) **Maintain Industrial and Commercial Facility/Activity Inventory.** The industrial and commercial facility/activity inventory must be updated at least annually. The updated inventory and a summary of the compliance assistance and inspection activities conducted, as well as any follow-up actions, must be submitted to EPA with each Annual Report.

4. Storm Water Infrastructure and Street Management. The Permittees must maintain their MS4 and related facilities to reduce the discharge of pollutants from the MS4 to the MEP. All Permittee-owned and operated facilities must be properly operated and maintained. This maintenance requirement includes, but is not limited to, structural storm water treatment controls, storm sewer systems, streets, roads, parking lots, snow disposal sites, waste facilities, and street maintenance and material storage facilities. The program must include the following:

- a) **Storm Sewer System Inventory and Mapping.** No later than January 30, 2018, the Permittees must update current records to develop a comprehensive inventory and map of the MS4s and associated outfall locations. The inventory must identify all areas over which each Permittee has responsibility. The inventory must include:
 - (i) the location of all inlets, catch basins and outfalls owned/operated by the Permittee;
 - (ii) the location of all MS4 collection system pipes (laterals, mains, etc.) owned/operated by the Permittee, including locations where the MS4 is physically interconnected to the MS4 of another operator ;

- (iii) the location of all structural flood control devices, if different from the characteristics listed above;
- (iv) the names and locations of receiving waters of the U.S. that receive discharges from the outfalls;
- (v) the location of all existing structural storm water treatment controls;
- (vi) identification of subwatersheds, associated land uses, and approximate acreage draining into each MS4 outfall; and
- (vii) the location of Permittee-owned vehicle maintenance facilities, material storage facilities, maintenance yards, and snow disposal sites; Permittee-owned or operated parking lots and roadways.

A summary description of the Permittees' storm sewer system inventory and a map must be submitted to EPA as part of the reapplication package required by Part VI.B

- b) **Catch Basin and Inlet Cleaning.** No later than September 30, 2016, the Permittees must initiate an inspection program to inspect all Permittee-owned or operated catch basins and inlets at least every two years and take appropriate maintenance action based on those inspections. Inspection records must be maintained and summarized in each Annual Report.
- c) **Street and Road Maintenance.** No later than September 30, 2015, the Permittees responsible for road and street maintenance must update any standard operating procedures for storm water controls to ensure the use of BMPs that, when applied to the Permittee's activity or facility, will protect water quality, and reduce the discharge of pollutants to the MEP. The operating procedures must contain, for each activity or facility, inspection and maintenance schedules specific to the activity, and appropriate pollution prevention/good housekeeping procedures for all of the following types of facilities and/or activities listed below. Water conservation measures should be considered for all landscaped areas.
 - (i) **Streets, roads, and parking lots.** The procedures must address, but are not limited to: road deicing, anti-icing, and snow removal practices; snow disposal areas; street/road material (e.g. salt, sand, or other chemical) storage areas; maintenance of green infrastructure/low impact development practices; and BMPs to reduce road and parking lot debris and other pollutants from entering the MS4. Within four years of the effective date of this permit, the Permittees must implement all of the pollution prevention/good housekeeping practices established in the SOPs for all streets, roads, highways, and parking lots with more than 3,000 square feet of impervious surface that are owned, operated, or maintained by the Permittees.
 - (ii) **Inventory of Street Maintenance Materials.** Throughout the Permit term, all Permittees with street maintenance

responsibilities must maintain an inventory of street /road maintenance materials, including use of sand and salt, and document the inventory in the corresponding Annual Reports.

- (iii) **Manage Sand with Salt and Salt Storage Areas.** No later than September 30, 2017, the Permittees must address any sand, salt, or sand with salt material stockpiles at each of their materials storage locations to prevent pollutants in stormwater runoff from discharging to the MS4 or into any receiving waterbody. Examples how the Permittee may choose to address runoff from their material storage areas include, but are not limited to: building covered storage areas; fully containing the material stockpile area in a manner that prevents runoff from discharging to the MS4 or a receiving waterbody; relocating and/or otherwise consolidating material storage piles to alternative locations which prevents discharges to the MS4 or a receiving waterbody. The Permittees must identify their material storage locations in the SWMP documentation submitted to EPA with the 1st year Annual Report and reference the average quantity of material stored at each location in the inventory required in Part II.B.4.c.ii. Permittees must document in the 5th Year Annual Report how their material stockpiles have been addressed to prevent runoff from discharging to the MS4 or a receiving waterbody.
- d) **Street, Road and Parking Lot Sweeping.** Each Permittee with street, road, and/or public parking lot maintenance responsibilities must update their respective sweepings management plans no later than September 30, 2015. Each updated plan must designate all streets, roads, and/or public parking lots which are owned, operated or maintained by that Permittee to fit within one of the following categories for sweeping frequency based on land use, traffic volumes or other factors:
- Residential – Streets and road segments that include, but are not limited to, light traffic zones and residential zones.
 - Arterial and all other – Streets and road segments with high traffic volumes serving commercial or industrial districts.
 - Public Parking Lots – large lots serving schools and cultural facilities, plazas, sports and event venues or similar facilities.
- (i) No later than September 30, 2014, each Permittee with street, road, and/or public parking lot maintenance responsibilities must inventory and map all of their designated streets, roads, and public parking lots for sweeping frequency. The resulting inventory and map must be submitted as part of the 2nd Year Annual Report.
- (ii) No later than September 30, 2015, Permittees with street, road, and/or public parking lot maintenance responsibilities must

sweep all streets, roads, and public parking lots that are owned, operated or maintained by that Permittee according to the following schedule:

Table II.B-2

Roadway Type	Sweeping Schedule			
	Two Times Per Month	Every Six Weeks	Four Times Per Year	One Time Per Year
Downtown Areas of Boise and Garden City	X			
Arterial and Collector Roadways (non-downtown)		X		
Residential Roadways			X	
Paved Alleys and Public Parking Lots				X

- (iii) If a Permittee’s existing overall street/road/parking lot sweeping program provides equivalent or greater street sweeping frequency to the requirements above, the Permittee must continue to implement its existing street/road/parking lot sweeping program.
- (iv) For areas where sweeping is technically infeasible, the Permittees with street, road, and/or public parking lot maintenance responsibilities must document in the 1st Year Annual Report each area and indicate why sweeping is infeasible. The Permittee must document what alternative sweeping schedule will be used, or how the Permittee will increase implementation of other trash/litter control procedures to minimize pollutant discharges to the MS4 and to receiving waters.
- (v) The Permittees with street, road, and/or public parking lot maintenance responsibilities must estimate the effectiveness of their street sweeping activities to minimize pollutant discharges to the MS4 and receiving waters, and document the following in each Annual Report:

- Identify any significant changes to the designated road/street/parking lot inventory and map, and the basis for those changes;
 - Report annually on types of sweepers used, swept curb and/or lane miles, dates of sweeping by general location and frequency category, volume or weight of materials removed and a representative sample of the particle size distribution of swept material;
 - Report annually on any public outreach efforts or other means to address excess leaves and other material as well as areas that are infeasible to sweep.
- e) **Implement appropriate requirements for pesticide, herbicide, and fertilizer applications.** Permittees must continue to implement practices to reduce the discharge of pollutants to the MS4 associated with the application, storage and disposal of pesticides, herbicides and fertilizers from municipal areas and activities. Municipal areas and activities include, at a minimum, municipal facilities, public right-of-ways, parks, recreational facilities, golf courses, and landscaped areas. All employees or contractors of the Permittees applying restricted use pesticides must be registered as certified applicators.
- f) **Develop and implement Storm Water Pollution Prevention Plans.** No later than September 30, 2015, the Permittees must develop and implement SWPPPs for all Permittee-owned material storage facilities, and maintenance yards located within the Permit area and identified in the inventory required in Parts II.B.3.a and II.B.4.a.viii. Permittee-owned facilities discharging storm water associated with industrial activity as defined in 40 CFR 122.26(b)(14) must obtain separate NPDES permit coverage as required in Part I.D.4 of this permit.
- g) **Storm Water Management.** Each Permittee must ensure that any storm water management projects it undertakes after the effective date of this Permit are designed and implemented to prevent adverse impacts on water quality.
- (i) Permittees must evaluate the feasibility of retrofitting existing storm water control devices to provide additional pollutant removal from collected storm water.
 - (ii) No later than the expiration date of this Permit, Permittees must identify and define all locations where such retrofit project opportunities are feasible, identify appropriate funding sources, and outline project timelines or schedule(s) for retrofit projects designed to better control the discharge of pollutants of concern to the Boise River and its tributaries.
- h) **Litter Control.** Throughout the Permit term, each Permittee must continue to implement effective methods to reduce litter within their jurisdiction. Permittees must work with others as appropriate to control litter on a

regular basis and after major public events to reduce the discharge of pollutants to receiving waters.

- i) **Training.** The Permittees must provide regular training to appropriate Permittee staff on all operations and maintenance procedures designed to prevent pollutants from entering the MS4 and receiving waters. Appropriate Permittee staff must receive training no later than September 30, 2015, and annually thereafter.

5. Illicit Discharge Management. An illicit discharge is any discharge to an MS4 that is not composed entirely of storm water. Exceptions are described in Part I.D. of this permit. The Permittees must continue to implement their illicit discharge management program to reduce to the MEP the unauthorized and illegal discharge of pollutants to the MS4. The program must include:

- a) **Ordinance or other regulatory mechanisms.** Upon the effective date of this Permit, the Permittees must effectively prohibit non-storm water discharges to the MS4 (except those identified in Part 1.D of this permit) through enforcement of relevant ordinances or other regulatory mechanisms. Such ordinances/regulatory mechanisms must be updated prior to the expiration date of this Permit as necessary to provide adequate controls. To be considered adequate, an ordinance or regulatory mechanism must:
 - (i) Authorize the Permittee to prohibit, at a minimum, the following discharges to the MS4, unless otherwise authorized in Part 1.D:
 - Sewage;
 - Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
 - Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility, including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
 - Discharges of wash water from mobile operations, such as mobile automobile or truck washing, steam cleaning, power washing, and carpet cleaning, etc.;
 - Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas - including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc. - where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);
 - Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;

- Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;
 - Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and
 - Discharges of food-related wastes (grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).
- (ii) Prohibit and eliminate illicit connections to the MS4;
- (iii) Control the discharge of spills, and prohibit dumping or disposal of materials other than storm water into the MS4.
- b) **Illicit Discharge Complaint Reporting and Response Program.** At a minimum, Permittees must respond to reports of illicit discharges from the public in the following manner:
- (i) **Complaint/Reporting Hotline.** The Permittees must maintain the dedicated telephone number and email address, or other publicly available and accessible means in addition to the website required in Part II.B.6, for use by the public to report illicit discharges. This complaint hotline must be answered by trained staff during normal business hours. During non-business hours, a system must be in place to record incoming calls to the hotline and a system must be in place to guarantee timely response. The telephone number must be printed on appropriate education, training, and public participation materials produced under Part II.B.6, and clearly listed in the local telephone book as appropriate.
 - (ii) **Response to Complaints/Reports.** The Permittees must respond to all complaints or reports of illicit discharges as soon as possible, but no later than within two working days.
 - (iii) **Maintain log of complaints/reports received and actions taken.** The Permittees must maintain a record documenting all complaints or reports of illicit discharges and responses taken by the Permittees.
- c) **Illicit Discharge Mapping.** No later than September 30, 2014, the Permittees must develop a map of reported and documented illicit discharges or illicit connections to identify priority areas. The map must identify, at a minimum, the location, type and relative quantity or severity of the known, recurrent or ongoing non-storm water discharges to the MS4. This map must be updated annually and used to target the specific outfall locations for that field screening season.
- d) **Dry Weather Outfall Screening Program.** Permittees must implement, and update as necessary, a dry weather analytical and field screening monitoring program. This dry weather outfall screening program must emphasize frequent, geographically widespread monitoring to detect illicit discharges and illegal connections, and to reinvestigate potentially

problematic outfalls. At a minimum, the procedures must be based on the following guidelines and criteria:

- (i) **Outfall Identification.** The Permittees must update as necessary the storm water outfall identification and screening plan, describing the reconnaissance activities that must be performed and information used to prioritize targeted outfalls and associated land uses.. The plan must discuss how chemical and microbiological analysis will be conducted on any flows identified during dry weather screening, including field screening methodologies and associated trigger thresholds to be used for determining follow-up action.
- (ii) **Monitoring Illicit Discharges.** No later than September 30, 2015, dry weather analytical and field screening monitoring must be conducted at least once annually (or more often if the Permittees deem necessary). One third of the outfalls to be screened annually must be conducted within the June 1 and September 30th timeframe.
 - Upon the effective date of the Permit, the Permittees must conduct visual dry weather screening of at least 20% of their total outfalls per year.
 - The outfalls must be geographically dispersed across the MS4 and must represent all major land uses in the Permit area. In addition, the Permittees must ensure that dry weather screening includes, but is not limited to, screening of 20% outfalls discharging to impaired waters listed in Table II.C.
 - When flows during dry weather are identified the Permittees must collect grab samples of the discharge for in-field analysis of the following indicator constituents: pH; total chlorine; detergents as surfactants; total copper; total phenols; *E. coli*; total phosphorus; turbidity; temperature; and suspended solids concentrations (to be measured in mg/L).
 - Photos may be used to document conditions.
 - Results of field sampling must be compared to established trigger threshold levels and/or existing state water quality standards. If the outfall is dry (no flowing or ponded runoff), the Permittees must make and record all applicable visual observations.
 - All dry weather flows previously identified or documented by the Permittees to be associated with irrigation flows or ground water seepage must be sampled to assess pollutant loading associated with such flows. The results must be evaluated to identify feasible actions necessary to eliminate such flows and ensure compliance with Part I.D of this Permit. If field sample

results of such irrigation or groundwater seepage comply with Part I.D of this permit, annual sampling of that dry weather flow at that outfall is no longer required. Permittees must document in the SWMP document the specific location(s) of outfalls associated with these results as well as the Permittee's rationale for the conclusion to discontinue future dry weather screening at that location..

- (iii) **Maintain Records of Dry Weather Screening.** The Permittees must keep detailed records of the dry weather screening with the following information at a minimum: time since last rain event; quantity of last rain event; site description (e.g., conveyance type, dominant watershed land uses); flow estimation (e.g., width of water surface, approximate depth of water, approximate flow velocity, flow rate); visual observations (e.g., odor, color, clarity, floatables, deposits/stains, vegetation condition, structural condition, and biology); results of any in field sampling; and recommendations for follow-up actions to address identified problems, and documentation of completed follow-up actions.
- e) **Follow-up.** The Permittees must investigate recurring illicit discharges identified as a result of complaints or as a result of dry weather screening inspections and sampling within fifteen (15) days of its detection to determine the source. Permittees must take appropriate action to address the source of the ongoing illicit discharge within 45 days of its detection.
- f) **Prevent and Respond to Spills to the MS4.** Throughout the Permit term, the Permittees must coordinate appropriate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies to ensure maximum water quality protection at all times. The Permittees must respond to, contain and clean up all sewage and other spills that may discharge into the MS4 from any source (including private laterals and failing septic systems).
- g) **Facilitate Disposal of Used Oil and Toxic Materials.** The Permittees must continue to coordinate with appropriate agencies to ensure the proper management and disposal or recycling of used oil, vehicle fluids, toxic materials, and other household hazardous wastes by their employees and the public. Such a program must include educational activities, public information activities, and establishment of collection sites operated by the Permittees or other entity. The program must be implemented throughout the Permit term.
- h) **Training.** No later than September 30, 2014, and annually thereafter, the Permittees must develop and provide training to staff on identifying and eliminating illicit discharges, spill, and illicit connections to the MS4. At a minimum, the Permittee's construction inspectors, maintenance field staff, and code compliance officers must be sufficiently trained to respond to illicit discharges and spills to the MS4.

6. Education, Outreach and Public Involvement.

- a) **Comply with Applicable Requirements.** The Permittees must comply with applicable State and local public notice requirements when implementing their SWMP public involvement activities.
- b) **Implement an Ongoing Education Outreach and Involvement Program.** The Permittees must conduct, or contract with other entities to conduct, an ongoing joint education, outreach and public involvement program aimed at residents, businesses, industries, elected officials, policy makers, and Permittee planning staff /other employees.

The goal of the education and outreach program is to reduce or eliminate behaviors and practices that cause or contribute to adverse storm water impacts. The goal of the public involvement program is to engage interested stakeholders in the development and implementation of the Permittees' SWMP activities to the extent allowable pursuant to the respective authority granted individual Permittees under Idaho law.

The Permittees' joint education and public involvement program must be designed to improve each target audience's understanding of the selected storm water issues, engage stakeholders, and help target audiences understand what they can do to positively impact water quality by preventing pollutants from entering the MS4.

- (i) No later than September 30, 2014, the Permittees must implement or participate in an education, outreach and public involvement program using a variety of methods to target each of the audiences and at least one or more of the topics listed below:

- 1) General Public

- Watershed characteristics and subwatershed planning efforts as required in Part II.A.4;
- General impacts of storm water flows into surface water;
- Impacts from impervious surfaces;
- Source control best management practices and environmental stewardship, actions and opportunities for pet waste control/disposal, vehicle maintenance, landscaping and vegetative buffers;
- Water wise landscaping, water conservation, water efficiency.

- 2) General public and businesses, including home based and mobile businesses

- Best management practices for use and storage of automotive chemicals, hazardous cleaning supplies, vehicle wash soaps and other hazardous materials;

- Proper use and application of pesticides, herbicides and fertilizers;
 - Impacts of illicit discharges and how to report them;
 - Water wise landscaping, water conservation, water efficiency.
- 3) Homeowners, homeowner's associations, landscapers, and property managers
- Yard care techniques protective of water quality, such as composting;
 - Best management practices for use and storage of pesticides, herbicides, and fertilizers;
 - Litter and trash control and recycling programs;
 - Best management practices for power washing, carpet cleaning and auto repair and maintenance;
 - Low Impact Development techniques, including site design, pervious paving, retention of mature trees and other vegetation;
 - Storm water treatment and flow/volume control practices;
 - Water wise landscaping, water conservation, water efficiency.
- 4) Engineers, contractors, developers, review staff, and land use planners
- Technical standards for storm water site plans;
 - Low Impact Development techniques, including site design, pervious paving, retention of mature trees and other vegetation;
 - Storm water treatment and flow/volume control practices;
 - Water wise landscaping, water conservation, water efficiency.
- 5) Urban farmers and managers of public and private community gardens
- Water wise landscaping, water conservation, and water efficiency.
- (ii) The Permittees must assess, or participate in an effort to assess understanding and adoption of behaviors by the target audiences.

The resulting assessments must be used to direct storm water education and outreach resources most effectively.

- (iii) The Permittees must track and maintain records of public education, outreach and public involvement activities.
- c) **Targeted Education and Training.** For the specific topics identified in the Permit sections listed below, the Permittees must develop and implement, or contract with other entities to implement, targeted training programs to educate appropriate Permittee staff or other audiences within their jurisdiction. Where joint, cooperative education efforts to address these topics are not feasible, the individual Permittee must ensure that the necessary education and training occurs for the following topics:
- (i) II.B.1.f - Construction Storm Water Management Training for construction site operators and Permittee staff;
 - (ii) II.B.2.g – Permanent Storm Water Control Training for project operators and Permittee staff;
 - (iii) II.B.4.i– Storm Water Infrastructure and Street Management/ Maintenance training for the Permittee staff; and
 - (iv) II.B.5.h – Illicit Discharge Management Training for Permittee staff.
- d) **Storm Water Website.** The Permittees must maintain and promote at least one publicly-accessible website that identifies each Permittee’s SWMP activities and seeks to educate the audiences listed in Part II.B.6.b.i. The website(s) must describe and provide relevant information regarding the activities of all Permittees. The website must be updated no later than February 1, 2014, and updated at least quarterly thereafter as new material is available. The website must incorporate the following features:
- (i) All reports, plans, or documents generated by each Permittee in compliance with this Permit must be posted on the website in draft form when input from the public is being solicited, and in final form when the document is completed.
 - (ii) Information and/or links to key sites that provide education, training, licensing, and permitting related to construction and post-construction storm water management controls and requirements for each jurisdiction. The website must include links to all applicable ordinances, policies and/or guidance documents related to the Permittees’ construction and post-construction stormwater management control programs.
 - (iii) Information and/or links to appropriate controls for industrial and commercial activities,
 - (iv) Information and/or links to assist the public to report illicit connections and illegal dumping activity;

- (v) Appropriate Permittee contact information, including phone numbers for relevant staff and telephone hotline, mailing addresses, and electronic mail addresses.

C. Discharges to Water Quality Impaired Receiving Waters.

1. The Permittees must conduct a storm water discharge monitoring program as required in Part IV.
2. For the purposes of this Permit and as listed in Table II.C, the Clean Water Act §303 (d) listed water bodies are those cited in the IDEQ 2010 Integrated Report including, but not limited to the Lower Boise River, and its associated tributaries. "Pollutant(s) of concern" refer to the pollutant(s) identified as causing or contributing to the water quality impairment. Pollutants of concern for the purposes of this Permit are: total phosphorus, sediment, temperature, and *E. coli*.
3. Each Permittees' SWMP documentation must include a description of how the activities of each minimum control measure in Part II.B are implemented by the Permittee to control the discharge of pollutants of concern and ensure that the MS4 discharges will not cause or contribute to an excursion above the applicable Idaho water quality standards. This discussion must specifically identify how the Permittee evaluates and measures the effectiveness of the SWMP to control the pollutants of concern. For those activities identified in Part II.B requiring multiple years to develop and implement, the Permittee must provide interim updates on progress to date. Consistent with Part II.A.1.b, each Permittee must submit this description of the SWMP implementation to EPA and IDEQ as part of the 1st Year Annual Report required in Part IV.C, and must update its description annually in subsequent Annual Reports.

Table II.C	
Clean Water Act §303 (d) listed Water Bodies and Pollutants of Concern	
Receiving Water Body Assessment Unit/ Description	Pollutants of Concern Causing Impairment
<i>ID17050114SW011a_06</i> <i>Boise River – Diversion Dam to River Mile 50</i>	Temperature
<i>ID17050114SW005_06</i> <i>Boise River – River Mile 50 to Star Bridge</i>	Temperature, Sediment, <i>E. coli.</i>
<i>ID17050114SW005_06a</i> <i>Boise River – Star to Middleton</i>	Temperature, Sediment, <i>E. coli.</i>
<i>ID17050114SW005_06b</i> <i>Boise River- Middleton to Indian Creek</i>	Temperature, Total phosphorus, Sediment, <i>E. coli.</i>
<i>ID17050114SW001_06</i> <i>Boise River- Indian Creek to the mouth</i>	Temperature, Total phosphorus, Sediment, <i>E. coli.</i>
<i>ID17050114SW008_03</i> <i>Tenmile Creek - 3rd order below Blacks Creek Reservoir</i>	Sediment, <i>E. coli.</i>
<i>ID17050114SW010_02</i> <i>Fivemile Creek - 1st & 2nd order tributaries</i>	<i>E. coli.</i>
<i>ID17050114SW010_03</i> <i>Fivemile Creek - 3rd order-tributaries</i>	Sediment, <i>E. coli.</i>

D. Reviewing and Updating the SWMP.

1. Permittees must annually review their SWMP actions and activities for compliance with this Permit as part of the preparation of the Annual Report required under Part IV.C.2.
2. Permittees may request changes to any SWMP action or activity specified in this Permit in accordance with the following procedures:
 - a) Changes to delete or replace an action or activity specifically identified in this Permit with an alternate action or activity may be requested by the Permittees at any time. Modification requests to EPA must include:
 - (i) An analysis of why the original action or activity is ineffective, infeasible, or cost prohibitive;
 - (ii) Expectations on the effectiveness of the replacement action or activity; and
 - (iii) An analysis of why the replacement action or activity is expected to better achieve the Permit requirements.
 - b) Change requests must be made in writing and signed by the Permittees in accordance with Part VI.E.
 - c) Documentation of any of the actions or activities required by this Permit must be submitted to EPA upon request.
 - d) EPA may review Annual Reports or other such documentation and subsequently notify the Permittees that changes to the SWMP actions and activities are necessary to:
 - (i) Address discharges from the MS4 that are causing or contributing to water quality impacts;
 - (ii) Include more stringent requirements necessary to comply with new federal or state statutory or regulatory requirements; or
 - (iii) Include other conditions deemed necessary by EPA to comply with water quality standards, and/or other goals and requirements of the CWA.
 - e) If EPA notifies the Permittees that changes are necessary pursuant to Parts II.D.2.a or II.D.2.d, the notification will offer the Permittees an opportunity to propose alternative program changes to meet the objectives of the requested modification. Following this opportunity, the Permittees must implement any required changes according to the schedule set by EPA.
4. Any modifications to this Permit will be accomplished according to Part VI.A of this Permit.

E. Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation. The Permittees must implement the actions and activities of the SWMP in all new areas added or transferred to the Permittee's MS4 (or for which a Permittee becomes responsible for implementation of storm water quality controls) as expeditiously as practicable, but not later than one year from the date upon which the new areas were added. Such additions and schedules for implementation must be documented in the next Annual Report following the transfer.

F. SWMP Resources. The Permittees must continue to provide adequate finances, staff, equipment and other support capabilities to implement their SWMP actions and activities outlined in this permit. The Permittees must report on total costs associated with SWMP implementation over the prior 12 month reporting period in each Annual Report. Permittees are encouraged to consider establishing consistent funding sources for continued program implementation.

G. Legal Authority. To the extent allowable pursuant to the respective authority granted individual Permittees under Idaho law, each Permittee must operate to, at a minimum:

- Prohibit and eliminate, through statute, ordinance, policy, permit, contract, court or administrative order or other similar means, the contribution of pollutants to the MS4 by illicit connections and discharges to the MS4. Illicit connections include pipes, drains, open channels, or other conveyances that have the potential to allow an illicit discharge to enter the MS4. Illicit discharges include all non-storm water discharges not otherwise authorized under Part I.D. of this Permit;
- Control through statute, ordinance, policy, permit, contract, court or administrative order, or other similar means, the discharge to the MS4 of spills, dumping or disposal of materials other than storm water;
- Control through interagency agreements among the Permittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;
- Require compliance with conditions in statutes, ordinances, policy, permits, contracts, or court or administrative orders; and
- Carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with Permit conditions including the prohibition on illicit discharges to the MS4.

No later than January 30, 2014, each Permittee must review and revise its relevant ordinances or other regulatory mechanisms, (or adopt new ordinances or regulatory mechanisms that provide it with adequate legal authority as allowed and authorized pursuant to applicable Idaho law), to control pollutant discharges into and from its MS4 and to meet the requirements of this permit. As part of the SWMP documentation that accompanies the 1st Year Annual Report, each Permittee must summarize all of its unique legal authorities which satisfy the five criteria listed above.

III. Schedule for Implementation and Required Submissions

The Permittees must complete SWMP actions, and/or submit documentation, to EPA and IDEQ as summarized below. Unless otherwise noted, Annual Reports must include the interim or completed status of required SWMP activities occurring during the corresponding reporting period as specified in Part IV.C.3, and include program summary statistics, copies of interim or final documents, and/or other supporting information.

Table III. Schedule for Implementation and Required Submissions		
Permit Part	Item/Action	Due Date
I.C.3	Update intergovernmental agreement no later than July 1, 2013.	Submit updated intergovernmental agreement with the 1 st Year Annual Report.
II.A.1.b, II.C.3	SWMP documentation	Submit SWMP documentation with the 1 st Year Annual Report. Include updated documentation in each subsequent Annual Report.
II.A.4	Complete two subwatershed planning documents	Identify subwatersheds in 1 st Year Annual Report; Submit two completed planning documents with the 4 th Year Annual Report.
II.B.1.a	Update construction runoff control ordinances/regulatory mechanisms, if necessary	September 30, 2015; submit any updated ordinances etc w/ 3 rd Year Annual Report.
II.B.1.b	Update Construction Stormwater Management Manual(s)	September 30, 2015; submit any updated documents with 3 rd Year Annual Report.
II.B.1.e	Develop & Implement Enforcement Response Policy (ERP)	September 30, 2016; submit final ERPs w/ 4 th Year Annual Report
II.B.2.a	Update ordinance or regulatory mechanism requiring long term onsite stormwater management controls	January 30, 2018; submit ordinance or regulatory mechanism with 5 th Year Annual Report.
II.B.2.b	Update Stormwater Design Criteria Manual(s)	September 30, 2015; submit any updated ordinances etc w/ 3 rd Year Annual Report
II.B.2.c	Develop & Implement Green Infrastructure/Low Impact Development (LID) Incentive Strategy;	September 30, 2015;
II.B.2.c.i	Evaluate Effectiveness of LID Practices via three Pilot Projects;	Submit strategy document, identify 3 pilot projects in the 3 rd Year Annual Report.
II.B.2.c.ii, IV.A.10	Identify recommendations for specific LID practices to be adopted within the Permit area	Progress report on strategy implementation/ Pilot Project evaluations w/4 th Year Annual Report. Submit final evaluations & recommendations with the 5 th Year Annual Report.
II.B.2.c.iii	Develop Priority Riparian Area List	September 30, 2015; Submit priority area list with the 3 rd Year Annual Report.
II.B.2.c.iii	Complete Outfall Disconnection Project	Document progress on outfall disconnection project w/3 rd Year Annual Report. Complete outfall disconnection project by January 30, 2018; document completed project in 5 th Year Annual Report.

Table III. Schedule for Implementation and Required Submissions, continued

Permit Part	Item/Action	Due Date
II.B.2.c.iv	Consider/install stormwater runoff reduction techniques for streets, roads & parking lot repair work entering design phase after February 1, 2013 where feasible	Document all locations of street/road/parking lot repair projects where runoff reduction techniques were installed w/5 th Year Annual Report.
II.B.2.e.i	O&M Database of new permanent stormwater controls; Incorporate all existing controls into database	Include new controls beginning February 1, 2013; Existing controls, no later than January 30, 2018.
II.B.2.f.i	Identify high priority locations; annual inspections	September 30, 2017
II.B.2.f.ii	Develop inspection checklists	September 30, 2017
II.B.2.f.iii	Enforcement Response Policy for SW controls	September 30, 2017
II.B.2.g	Conduct Education/Training on Permanent SW Controls	September 30, 2015; staff training & training for local audiences, September 30, 2016.
II.B.3.a	Inventory Industrial & Commercial facilities/activities	September 30, 2016
II.B.3.a.iii	Identify two specific activities, develop BMPs, and begin compliance assistance education program	September 30, 2016
II.B.3.b	Update Permittee agreements; inspect selected industrial & commercial facilities/activities	September 30, 2016
II.B.3.c	Document industrial & commercial inspection and compliance assistance activities	Annually
II.B.4.a	Update MS4 system inventory & map	No later than January 30, 2018; include w/5 th Year Annual Report
II.B.4.b	Inspect of catch basins at least every two years	September 30, 2016
II.B.4.c	Update SOPs for Street & Road Maintenance	September 30, 2015
II.B.4.c.iii	Cover storage facilities for sand/salt storage areas	September 30, 2017; Identify locations in SWMP w/1 st year Annual Report; Final documentation w/5 th Year Annual Report
II.B.4.d	Update Street/Road/Parking Lot Sweeping Plans	September 30, 2015
II.B.4.d.i	Inventory/map designated areas	September 30, 2014; submit w/2 st Year Annual Report
II.B.4.d.ii	Sweep according to schedule	September 30, 2015
II.B.4.d.iv,	Identify infeasible sweeping areas, alternative schedule or other program	Document in 1 st Year Annual Report
II.B.4.d.v	Estimate sweeping effectiveness	Document in each Annual Report
II.B.4.f	Develop facility& maintenance yards SWPPPs	September 30, 2015
II.B.4.i	Train Permittee staff	September 30, 2016; annually thereafter
II.B.4.g	Evaluate the feasibility of retrofitting existing control devices	January 30, 2018; submit evaluation with 5 th Year Annual Report

Table III. Schedule for Implementation and Required Submissions, continued

Permit Part	Item/Action	Due Date
II.B.5.c	Inventory/Map Illicit Discharge Reports	September 30, 2014, update annually
II.B.5.d.ii, IV.A.11	Conduct dry weather outfall screening; update screening plan; inspect 20% of outfalls per year	September 30, 2015; inspect 20% annual ly
II.B.6.b	Conduct public education & assess understanding to specific audiences	September 30, 2014; ongoing
II.B.6.d	Maintain, Promote, and Update Storm water Website	September 30, 2014, quarterly thereafter
II.C.3, II.A.1.b	Identify how Permittee controls are implemented to reduce discharge of pollutants of concern, measure SWMP effectiveness	Include discussion in SWMP documentation submitted with 1 st Year Annual Report
II.E	Implement SWMP in all geographic areas newly added or annexed by Permittee	No later than one year from date new areas are added to Permittee's jurisdiction
II.F	Report SWMP implementation costs for the corresponding 12 month reporting period	Within each Annual Report
II.G	Review & Summarize legal authorities or regulatory mechanisms used by Permittee to implement & enforce SWMP & Permit requirements	No later than January 30, 2014, summarize legal authorities within the required SWMP documentation submitted with 1 st Annual Report
IV.A.1	Assess & Document Permit Compliance	Annually; submit with Annual Reports
IV.A.2	Develop & Complete Stormwater Monitoring & Evaluation Plan	September 30, 2014; Submit Completed Plan with 2 nd Year Annual Report
IV.A.7.a	Update <i>Boise NPDES Municipal SW Monitoring Plan</i>	September 30, 2015
IV.A.7.b	Monitor Five Representative Outfalls During Wet Weather; sample three times per year thereafter	No later than September 30, 2014
IV.A.8	If Applicable: update SW Monitoring & Evaluation Plan to include WQ Monitoring and/or Fish Tissue Sampling	If applicable: Update SW Monitoring & Evaluation Plan by September 30, 2014 to include WQ Monitoring and/or Fish Tissue Sampling; submit with 2 nd Year Annual Report
IV.A.9	Evaluate Effectiveness of 2 Structural Control Techniques Currently Required by the Permittees	Begin evaluations no later than September 30, 2015; document in Annual Report(s)
IV.C.1	Submit Stormwater Outfall Discharge Data	2 nd Year Annual Report, annually thereafter
IV.C.2	Submit WQ Monitoring or Fish Tissue Sampling Data Report (if applicable)	2 nd Year Annual Report, annually thereafter
IV.C.3	Submit Annual Reports	1 st Year Annual Report due January 30, 2014; all subsequent Annual Reports are due annually no later than January 30 th ; See Table IV.C.
VI.B	Submit Permit Renewal Application	No later than 180 days prior to Permit Expiration Date; see cover page. Alternatively, Renewal Application may be submitted as part of the 4 th Year Annual Report.

IV. Monitoring, Recordkeeping and Reporting Requirements.

A. Monitoring

1. **Assess Permit Compliance.** At least once per year, each Permittee must individually evaluate their respective organization's compliance with these Permit conditions, and progress toward implementing each of the control measures defined in Part II. The compliance evaluation must be documented in each Annual Report required in Part IV.C.2.
2. **Stormwater Monitoring and Evaluation Program Plan and Objectives.** The Permittees must conduct a wet weather monitoring and evaluation program, or contract with another entity to implement such a program. This stormwater monitoring and evaluation program must be designed to characterize the quality of storm water discharges from the MS4, and to evaluate overall effectiveness of selected storm water management practices.
 - a) No later than September 30, 2014, the Permittees must develop a stormwater monitoring and evaluation plan that includes the quality assurance requirements, outfall monitoring, in-stream and/or fish tissue monitoring (as appropriate), evaluation of permanent storm water controls and evaluation of LID pilot project effectiveness as described later in this Part. In general, the Permittees must develop and conduct a stormwater monitoring and evaluation program to:
 - (i) Broadly estimate reductions in annual pollutant loads of sediment, bacteria, phosphorus and temperature discharged to impaired receiving waters from the MS4s, occurring as a result of the implementation of SWMP activities;
 - (ii) Assess the effectiveness and adequacy of the permanent storm water controls and LID techniques or controls selected for evaluation by the Permittees and which are intended to reduce the total volume of storm water discharging from impervious surfaces and/or improve overall pollutant reduction in stormwater discharges; and
 - (iii) Identify and prioritize those portions of each Permittee's MS4 where additional controls can be accomplished to further reduce total volume of storm water discharged and/or reduce pollutants in storm water discharges to waters of the U.S.
 - b) The final, updated stormwater monitoring and evaluation plan must be submitted to EPA with the 2nd Year Annual Report.
3. **Representative Sampling.** Samples and measurements must be representative of the nature of the monitored discharge or activity.
4. **Analytical Methods.** Sample collection, preservation, and analysis must be conducted according to sufficiently sensitive methods/test procedures approved under 40 CFR Part 136, unless otherwise approved by EPA. Where an approved 40 CFR Part 136 method does not exist, and other test procedures

have not been specified, any available method may be used after approval from EPA.

5. **Quality Assurance Requirements.** The Permittees must develop or update a quality assurance plan (QAP) for all analytical monitoring conducted in accordance with this Part. The QAP must be developed concurrently as part of the stormwater monitoring and evaluation plan. The Permittees must submit the QAP as part of the stormwater monitoring and evaluation plan to EPA and IDEQ in the 2nd Year Annual Report. Any existing QAP may be modified for the requirements under this section.

- a) The QAP must be designed to assist in the collection and analysis of storm water discharges in support of this Permit and in explaining data anomalies when they occur.
- b) Throughout all sample collection, analysis and evaluation activities, Permittees must use the EPA-approved QA/QC and chain-of-custody procedures described in the most current version of the following documents:
 - (i) *EPA Requirements for Quality Assurance Project Plans EPA-QA/R-5* (EPA/240/B-01/003, March 2001). A copy of this document can be found electronically at:
<http://www.epa.gov/quality/qs-docs/r5-final.pdf>;
 - (ii) *Guidance for Quality Assurance Project Plans EPA-QA/G-5*, (EPA/600/R-98/018, February, 1998). A copy of this document can be found electronically at:
<http://www.epa.gov/r10earth/offices/oea/epaqag5.pdf> ;
 - (iii) *Urban Storm BMP Performance Monitoring*, (EPA-821-B-02-001, April 2002). A copy of this document can be found electronically at:
<http://www.epa.gov/npdes/pubs/montcomplete.pdf>

The QAP should be prepared in the format specified in these documents.

- c) At a minimum, the QAP must include the following:
 - (i) Organization chart reflecting responsibilities of key Permittee staff;
 - (ii) Details on the number of samples, type of sample containers, preservation of samples, holding times, analytical methods, analytical detection and quantitation limits for each target compound, type and number of quality assurance field samples, precision and accuracy requirements, sample representativeness and completeness, sample preparation requirements, sample shipping methods, and laboratory data delivery requirements;
 - (iii) Data quality objectives;

- (iv) Map(s) and associated documentation reflecting the location of each sampling point and physical description including street address or latitude/longitude;
 - (v) Qualification and training of personnel;
 - (vi) Name(s), address(es) and telephone number(s) of the laboratories, used by or proposed to be used by the Permittees;
 - (vii) Data management;
 - (viii) Data review, validation and verification; and
 - (ix) Data reconciliation.
- d) The Permittees must amend the QAP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAP. The amended QAP must be submitted to EPA as part of the next Annual Report.
- e) Copies of any current QAP must be maintained by the Permittees and made available to EPA and/or IDEQ upon request.
6. **Additional Monitoring by Permittees.** If the Permittees monitor more frequently, or in more locations, than required by this Permit, the results of any such additional monitoring must be included and summarized with other data submitted to EPA and IDEQ as required in Part IV.C.
7. **Storm Water Outfall Monitoring**
- a) No later than September 30, 2015, the Permittees must update the existing *Boise NPDES Municipal Storm Water Permit Monitoring Plan* to be consistent with the monitoring and evaluation program objectives and plan as described in Part IV.A.2. At a minimum, the plan must describe five outfall sample locations, and any additional or alternative locations, as defined by the Permittees. The outfalls selected by the Permittees to be monitored must be identified as representative of all major land uses occurring within the Permit area.
 - b) No later than September 30, 2014, the Permittees must begin monitoring discharges from the identified five storm water outfalls during wet weather events at least three times per year. The specific minimum monitoring requirements are outlined in Table IV.A, but may be augmented based on the Permittees' updated stormwater monitoring and evaluation plan required by Part IV.A.2. The Permittees must include any additional parameters to be sampled in an updated Table IV.A within the final updated stormwater monitoring and evaluation plan submitted to EPA with the 2nd Annual Report.

Table IV.A – Outfall Monitoring Requirements^{1, 2}
PARAMETER SAMPLING
Ammonia
Total Kjeldahl Nitrogen (TKN) (mg/l)
Nitrate + Nitrite
Total Phosphorus (mg/l)
Dissolved Orthophosphate (mg/l)
<i>E. coli</i>
Biological Oxygen Demand (BOD5) (mg/l)
Chemical Oxygen Demand (COD) (mg/l)
Total Suspended Solids (TSS) (mg/l)
Total Dissolved Solids (TDS) (mg/l)
Dissolved Oxygen
Turbidity (NTU)
Temperature
pH (S.U)
Flow/Discharge, Volume, in cubic feet
Arsenic – Total
Cadmium- Total and Dissolved
Copper – Dissolved
Lead – Total and Dissolved
Mercury – Total
Zinc – Dissolved
Hardness (as CaCO3) (mg/l)
<p>¹ Five or more outfall locations will be identified in the Permittees' updated stormwater monitoring and evaluation plan</p> <p>² A minimum of <i>three (3) samples</i> must be collected during wet weather storm events in each reporting year, assuming the presence of storm events sufficient to produce a discharge.</p>

8. **Water Quality Monitoring and/or Fish Tissue Sampling.** At the Permittees' option and to augment the storm water discharge data collection required in Part IV.A.7 above, one or more of the Permittees may conduct, or contract with others to conduct, water quality monitoring and/or fish tissue sampling within the Lower Boise River Watershed.
- a) If the Permittees elect to conduct in-stream water quality monitoring and/or fish tissue sampling within the Lower Boise River Watershed, the Permittees must revise the stormwater monitoring and evaluation plan and QAP to describe the monitoring and/or sampling effort(s) per Part IV.A.2 and IV.A.5, no later September 30, 2014.
 - b) The documentation of the Permittees' intended in-stream water quality monitoring and/or fish tissue sampling activities must be included in the final updated stormwater monitoring and evaluation plan submitted with the 2nd Year Annual Report as required in Part IV.A.2.b.
 - c) The Permittees are encouraged to engage in cooperative efforts with other organizations to collect reliable methylmercury fish tissue data within a specific geographic area of the Lower Boise River Watershed. The objective of the cooperative effort is to determine if fish tissue concentrations of methylmercury in the Lower Boise River are compliant with Idaho's methylmercury fish tissue criterion of 0.3 mg/kg.
 - (i) In particular, the Permittees are encouraged to cooperate with other organizations to collect data through implementation of the Methylmercury Fish Tissue Sampling requirements specified in NPDES Permits # ID-002044-3 and ID-002398-1 as issued to the City of Boise. Beginning with the 2nd Year Annual Report, the Permittees' may (individually or collectively) submit documentation in each Annual Report which describes their specific involvement over the prior reporting period, and may reference fish tissue sampling plans and data reports as developed or published by others through the cooperative watershed effort.
9. **Evaluate the Effectiveness of Required Structural Controls.** Within two years of the effective date of this Permit, the Permittees must select and begin to evaluate at least two different types of permanent structural storm water management controls currently mandated by the Permittees at new development or redevelopment sites. For each selected control, this evaluation must determine whether the control is effectively treating or preventing the discharge of one or more of the pollutants of concern into waterbodies listed in Table II.C. The results of this evaluation, and any recommendations for improved treatment performance, must be submitted to EPA in subsequent Annual Reports as the evaluation projects are implemented and completed.
10. **Evaluate the Effectiveness of Green Infrastructure/Low Impact Development Pilot Projects.** The Permittees must evaluate the performance and effectiveness of the three pilot projects required in Part II.B.2.c of this Permit, or contract with another entity to conduct such evaluations. An evaluation summary of the LID technique or control and any recommendations

of improved treatment performance must be submitted in subsequent Annual Reports as the evaluation projects are implemented and completed.

11. **Dry Weather Discharge Screening.** The Permittees must implement a dry weather screening program, or contract with another entity to implement such a program, as required in Part II.B.5.d.

B. Recordkeeping

1. **Retention of Records.** The Permittees must retain records and copies of all information (e.g., all monitoring, calibration, and maintenance records; all original strip chart recordings for any continuous monitoring instrumentation; copies of all reports required by this Permit; storm water discharge monitoring reports; a copy of the NPDES permit; and records of all data or information used in the development and implementation of the SWMP and to complete the application for this Permit;) for a period of at least five years from the date of the sample, measurement, report or application, or for the term of this Permit, whichever is longer. This period may be extended at the request of the EPA at any time.
2. **Availability of Records.** The Permittees must submit the records referred to in Part IV.B.1 to EPA and IDEQ only when such information is requested. At a minimum, the Permittees must retain all records comprising the SWMP required by this Permit (including a copy of the Permit language and all Annual Reports) in a location and format that are accessible to EPA and IDEQ. The Permittees must make all records described above available to the public if requested to do so in writing. The public must be able to view the records during normal business hours. The Permittees may charge the public a reasonable fee for copying requests.

C. Reporting Requirements

1. **Storm Water Discharge Monitoring Report.** Beginning with the 2nd Year Annual Report, and in subsequent Annual Reports, all storm water discharge monitoring data collected to date must be submitted as part of the Annual Report. At a minimum, this Storm Water Discharge Monitoring Report must include:
 - a) Dates of sample collection and analyses;
 - b) Results of sample analyses;
 - c) Location of sample collection. and
 - d) Summary discussion and interpretation of the data collected, including a discussion of quality assurance issues and comparison to previously collected information, as appropriate.
2. **Water Quality Monitoring and/or Fish Tissue Sampling Report(s).** If the Permittees elect to conduct water quality monitoring and/or fish tissue sampling as specified in Part IV.A.8, all relevant monitoring data collected to date must

be submitted as part of each Annual Report beginning with the 2nd Year Annual Report. Summary data reports as prepared by other organizations with whom the Permittee(s) cooperate may be submitted to fulfill this requirement. At a minimum, this Water Quality Monitoring and/or Fish Tissue Sampling Report must include:

- a) Dates of sample collection and analyses;
- b) Results of sample analyses;
- c) Locations of sample collection; and
- d) Summary discussion and interpretation of the data collected, including discussion of quality assurance issues and comparison to previously collected information, as appropriate.

3. Annual Report.

- a) No later than January 30th of each year beginning in 2014, and annually thereafter, each Permittee must submit an Annual Report to EPA and IDEQ. The reporting period for the 1st Year Annual Report will be from February 1, 2013, through September 30, 2013. Reporting periods for subsequent Annual Reports are specified in Table IV.C. Copies of all Annual Reports, including each Permittee’s SWMP documentation, must be available to the public, through a Permittee-maintained website, and/or through other easily accessible means.

Table IV.C - Annual Report Deadlines		
Annual Report	Reporting Period	Due Date
1 st Year Annual Report	February 1, 2013–September 30, 2013	January 30, 2014
2 nd Year Annual Report	October 1, 2013-September 30, 2014	January 30, 2015
3 rd Year Annual Report	October 1, 2014-September 30, 2015	January 30, 2016
4 th Year Annual Report	October 1, 2015-September 30, 2016	January 30, 2017
5 th Year Annual Report	October 1, 2016-December 31, 2017	January 30, 2018

- b) Preparation and submittal of the Annual Reports must be coordinated by Ada County Highway District. Each Permittee is responsible for content of their organization’s SWMP documentation and Annual Report(s) relating to SWMP implementation for portions of the MS4s for which they are responsible.
- c) The following information must be submitted in each Annual Report:

- (i) A updated and current document describing the SWMP as implemented by the specific Permittee, in accordance with Part II.A.1.b;
 - (ii) A narrative assessment of the Permittee's compliance with this Permit, describing the status of implementing the control measures in Parts II and IV. The status of each control measure must be addressed, even if activity has previously been completed, has not yet been implemented, does not apply to the Permittee's jurisdiction or operation, or is conducted on the Permittee's behalf by another entity;
 - (iii) Discussion of any information collected and analyzed during the reporting period, including but not limited to storm water monitoring data not included with the Storm Water Discharge Monitoring Report; dry weather monitoring results; Green Infrastructure/LID pilot project evaluation results, structural control evaluation results, and any other information collected or used by the Permittee(s) to assess the success of the SWMP controls at improving receiving water quality to the maximum extent practicable;
 - (iv) A summary of the number and nature of public education programs; the number and nature of complaints received by the Permittee(s), and follow-up actions taken; and the number and nature of inspections, formal enforcement actions, or other similar activities as performed by the Permittee(s) during the reporting period;
 - (v) Electronic copies of new or updated education materials, ordinances (or other regulatory mechanisms), inventories, guidance materials, or other products produced as required by this Permit during the reporting period;
 - (vi) A description and schedule of the Permittee's implementation of additional controls or practices deemed necessary by the Permittee, based on monitoring or other information, to ensure compliance with applicable water quality standards;
 - (vii) Notice if the Permittee is relying on another entity to satisfy any of the Permit obligations, if applicable; and
 - (viii) Annual expenditures for the reporting period, and estimated budget for the reporting period following each Annual Report.
- d) If, after the effective date of this Permit, EPA provides the Permittees with an alternative Annual Report format, the Permittees may use the alternative format in lieu of the required elements of Part IV.C.3.c.

D. Addresses

Reports and other documents required by this Permit must be signed in accordance with Part VI.E and submitted to each of the following addresses:

IDEQ: Idaho Department of Environmental Quality
Boise Regional Office
Attn: Water Program Manager
1410 North Hilton
Boise, ID 83854

EPA: United States Environmental Protection Agency
Attention: Storm Water MS4 Compliance Program
NPDES Compliance Unit
1200 6th Avenue, Suite 900 (OCE-133)
Seattle, WA 98101

Any documents and/or submittals requiring formal EPA approval must also be submitted to the following address:

United States Environmental Protection Agency
Attention: Storm Water MS4 Permit Program
NPDES Permits Unit
1200 6th Avenue, Suite 900 (OWW-130)
Seattle, WA 98101

V. Compliance Responsibilities.

A. Duty to Comply. The Permittees must comply with all conditions of this Permit. Any Permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, for Permit termination, revocation and reissuance, or modification, or for denial of a Permit renewal application.

B. Penalties for Violations of Permit Conditions

1. Civil and Administrative Penalties. Pursuant to 40 CFR Part 19 and the Act, any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701) (currently \$37,500 per day for each violation).

2. Administrative Penalties. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of this Act. Pursuant to 40 CFR Part 19

and the Act, administrative penalties for Class I violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701) (currently \$16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$37,500). Pursuant to 40 CFR Part 19 and the Act, penalties for Class II violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701) (currently \$16,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$177,500).

3. Criminal Penalties

- a) **Negligent Violations.** The Act provides that any person who negligently violates Sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than two years, or both.
- b) **Knowing Violations.** Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than six years, or both.
- c) **Knowing Endangerment.** Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
- d) **False Statements.** The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Permit shall, upon conviction, be

punished by a fine of not more than \$10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for the Permittees in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Permit.

D. Duty to Mitigate. The Permittees must take all reasonable steps to minimize or prevent any discharge or disposal in violation of this Permit that has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The Permittees must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittees to achieve compliance with the conditions of this Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the Permittees only when the operation is necessary to achieve compliance with the conditions of the Permit.

F. Toxic Pollutants. The Permittees must comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the Permit has not yet been modified to incorporate the requirement.

G. Planned Changes. The Permittee(s) must give notice to the Director and IDEQ as soon as possible of any planned physical alterations or additions to the permitted facility whenever:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as determined in 40 CFR §122.29(b);
or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in the Permit.

H. Anticipated Noncompliance. The Permittee(s) must give advance notice to the Director and IDEQ of any planned changes in the permitted facility or activity that may result in noncompliance with this Permit.

I. Twenty-four Hour Notice of Noncompliance Reporting

1. The Permittee(s) must report the following occurrences of noncompliance by telephone within 24 hours from the time the Permittee(s) becomes aware of the circumstances:

- a) any noncompliance that may endanger health or the environment;
- b) any unanticipated bypass that exceeds any effluent limitation in the permit (See Part IV.F., “Bypass of Treatment Facilities”);
- c) any upset that exceeds any effluent limitation in the permit (See Part IV.G., “Upset Conditions”); or
- d) any overflow prior to the stormwater treatment facility over which the Permittee(s) has ownership or has operational control. An overflow is any spill, release or diversion of municipal sewage including:
 - (1) an overflow that results in a discharge to waters of the United States; and
 - (2) an overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral) that does not reach waters of the United States.

2. The Permittee(s) must also provide a written submission within five days of the time that the Permittee(s) becomes aware of any event required to be reported under subpart 1 above. The written submission must contain:

- a) a description of the noncompliance and its cause;
- b) the period of noncompliance, including exact dates and times;
- c) the estimated time noncompliance is expected to continue if it has not been corrected; and
- d) steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- e) if the noncompliance involves an overflow, the written submission must contain:
 - (1) The location of the overflow;

- (2) The receiving water (if there is one);
- (3) An estimate of the volume of the overflow;
- (4) A description of the sewer system component from which the release occurred (e.g., manhole, constructed overflow pipe, crack in pipe);
- (5) The estimated date and time when the overflow began and stopped or will be stopped;
- (6) The cause or suspected cause of the overflow;
- (7) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
- (8) An estimate of the number of persons who came into contact with wastewater from the overflow; and
- (9) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps.

3. The Director of the Office of Compliance and Enforcement may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the NPDES Compliance Hotline in Seattle, Washington, by telephone, (206) 553-1846.

4. Reports must be submitted to the addresses in Part IV.D (“Addresses”).

J. Bypass of Treatment Facilities

1. **Bypass not exceeding limitations.** The Permittee(s) may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this Part.

2. Notice.

a) **Anticipated bypass.** If the Permittee(s) knows in advance of the need for a bypass, it must submit prior written notice, if possible at least 10 days before the date of the bypass.

b) **Unanticipated bypass.** The Permittee(s) must submit notice of an unanticipated bypass as required under Part III.G (“Twenty-four Hour Notice of Noncompliance Reporting”).

3. Prohibition of bypass.

a) Bypass is prohibited, and the Director of the Office of Compliance and Enforcement may take enforcement action against the Permittee(s) for a bypass, unless:

(1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The Permittee(s) submitted notices as required under paragraph 2 of this Part.

- b) The Director of the Office of Compliance and Enforcement may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 3.a. of this Part.

K. Upset Conditions

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the Permittee(s) meets the requirements of paragraph 2 of this Part. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2. Conditions necessary for a demonstration of upset. To establish the affirmative defense of upset, the Permittee(s) must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- a) An upset occurred and that the Permittee(s) can identify the cause(s) of the upset;
- b) The permitted facility was at the time being properly operated;
- c) The Permittee(s) submitted notice of the upset as required under Part V.I, “*Twenty-four Hour Notice of Noncompliance Reporting*,” and
- d) The Permittee(s) complied with any remedial measures required under Part V.D, “*Duty to Mitigate*.”

3. Burden of proof. In any enforcement proceeding, the Permittee(s) seeking to establish the occurrence of an upset has the burden of proof.

VI. General Provisions

A. Permit Actions.

1. This Permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR §§ 122.62, 122.64, or 124.5. The filing of a request by the Permittee(s) for a Permit modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any Permit condition.

2. Permit coverage may be terminated, in accordance with the provisions of 40 CFR §§122.64 and 124.5, for a single Permittee without terminating coverage for the other Permittees subject to this Permit.

B. Duty to Reapply. If the Permittees intend to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittees must apply for and obtain a

new permit. In accordance with 40 CFR §122.21(d), and unless permission for the application to be submitted at a later date has been granted by the Director, the Permittees must submit a new application at least 180 days before the expiration date of this Permit, or alternatively in conjunction with the 4th Year Annual Report. The reapplication package must contain the information required by 40 CFR §122.21(f), which includes: name and mailing address(es) of the Permittees(s) that operate the MS4(s), and names and titles of the primary administrative and technical contacts for the municipal Permittees(s). In addition, the Permittees must identify any previously unidentified water bodies that receive discharges from the MS4(s); a summary of any known water quality impacts on the newly identified receiving waters; a description of any changes to the number of applicants; and any changes or modifications to the Storm Water Management Program as implemented by the Permittees. The re-application package may incorporate by reference the 4th Year Annual Report when the reapplication requirements have been addressed within that report.

C. Duty to Provide Information. The Permittees must furnish to the Director and IDEQ, within the time specified in the request, any information that the Director or IDEQ may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittees must also furnish to the Director or IDEQ, upon request, copies of records required to be kept by this Permit.

D. Other Information. When the Permittees become aware that it failed to submit any relevant facts in a Permit application, or that it submitted incorrect information in a Permit application or any report to the Director or IDEQ, the Permittees must promptly submit the omitted facts or corrected information.

E. Signatory Requirements. All applications, reports or information submitted to the Director and IDEQ must be signed and certified as follows.

1. All Permit applications must be signed as follows:
 - a) For a corporation: by a responsible corporate officer.
 - b) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c) For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.
2. All reports required by the Permit and other information requested by the Director or the IDEQ must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a) The authorization is made in writing by a person described above;
 - b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or

position having overall responsibility for environmental matters for the organization; and

- c) The written authorization is submitted to the Director and IDEQ.
3. **Changes to Authorization.** If an authorization under Part VI.E.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part VI.E.2 must be submitted to the Director and IDEQ prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. **Certification.** Any person signing a document under this Part must make the following certification:

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

F. Availability of Reports. In accordance with 40 CFR Part 2, information submitted to EPA pursuant to this Permit may be claimed as confidential by the Permittees. In accordance with the Act, permit applications, permits and effluent data are not considered confidential. Any confidentiality claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice to the Permittees. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2, Subpart B (Public Information) and 41 Fed. Reg. 36902 through 36924 (September 1, 1976), as amended.

G. Inspection and Entry. The Permittees must allow the Director, IDEQ, or an authorized representative (including an authorized contractor acting as a representative of the Director), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the Permittees' premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring Permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

H. Property Rights. The issuance of this Permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, nor any infringement of state or local laws or regulations.

I. Transfers. This Permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the Permit to change the name of the Permittees and incorporate such other requirements as may be necessary under the Act. (See 40 CFR 122.61; in some cases, modification or revocation and reissuance is mandatory.)

J. State/Tribal Environmental Laws

1. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittees from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by Section 510 of the Act.
2. No condition of this Permit releases the Permittees from any responsibility or requirements under other environmental statutes or regulations.

K. Oil and Hazardous Substance Liability Nothing in this Permit shall be constructed to preclude the institution of any legal action or relieve the Permittees from any responsibilities, liabilities, or penalties to which the Permittees is or may be subject under Section 311 of the CWA or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

L. Severability The provisions of this Permit are severable, and if any provision of this permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to the circumstances, and the remainder of this Permit shall not be affected thereby.

VII. Definitions and Acronyms

All definitions contained in Section 502 of the Act and 40 CFR Part 122 apply to this Permit and are incorporated herein by reference. For convenience, simplified explanations of some regulatory/statutory definitions have been provided but, in the event of a conflict, the definition found in the statute or regulation takes precedence.

“Administrator” means the Administrator of the EPA, or an authorized representative.

“Animal facility” see “commercial animal facility.”

“Annual Report” means the periodic self –assessment submitted by the Permittee(s) to document incremental progress towards meeting the storm water management requirements and implementation schedules as required by this Permit. See Part IV.C.

“Best Management Practices (BMPs)” means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR § 122.2. BMP refers to operational activities, physical controls or educational measures that are applied to reduce the discharge of pollutants and minimize potential impacts upon receiving waters, and accordingly, refers to both structural and nonstructural practices that have direct impacts on the release, transport, or discharge of pollutants. See also “storm water control measure (SCM).”

“Bioretention” is the water quality and water quantity storm water management practice using the chemical, biological and physical properties of plants, microbes and soils for the removal of pollution from storm water runoff.

“Canopy Interception” is the interception of precipitation, by leaves and branches of trees and vegetation that does not reach the soil.

“CGP” and “Construction General Permit” means the current available version of EPA’s *NPDES General Permit for Storm Water Discharges for Construction Activities in Idaho*, Permit No. IDR12-0000. EPA’s CGP is posted on EPA’s website at www.epa.gov/npdes/stormwater/cgp.

“Commercial Animal Facility” as used in this Permit, means a business that boards, breeds, or grooms animals including but not limited to dogs, cats, rabbits or horses.

“Common Plan of Development” is a contiguous construction project or projects where multiple separate and distinct construction activities may be taking place at different times on different schedules but under one plan. The “plan” is broadly defined as any announcement or piece of documentation or physical demarcation indicating construction activities may occur on a specific plot; included in this definition are most subdivisions and industrial parks.

“Construction activity” includes, but is not limited to, clearing, grading, excavation, and other site preparation work related to the construction of residential buildings and non-residential buildings, and heavy construction (e.g., highways, streets, bridges, tunnels, pipelines, transmission lines and industrial non-building structures).

“Control Measure” as used in this Permit, refers to any action, activity, Best Management Practice or other method used to prevent or reduce the discharge of pollutants in stormwater to waters of the United States.

“CWA” or “The Act” means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et seq.

“Director” means the Environmental Protection Agency Regional Administrator, the EPA Director of the Office of Water and Watersheds, or an authorized representative.

“Discharge” when used without a qualifier, refers to “discharge of a pollutant” as defined at 40 CFR §122.2.

“Discharge of a pollutant” means (a) any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or (b) any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channelled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any “indirect discharger.”

“Discharge of Storm Water Associated with Construction Activity” as used in this Permit, refers to a discharge of pollutants in storm water runoff from areas where soil disturbing activities (*e.g.*, clearing, grading, or excavation), construction materials or equipment storage or maintenance (*e.g.*, fill piles, borrow areas, concrete truck washout, fueling) or other industrial storm water directly related to the construction process are located, and which are required to be managed under an NPDES permit. See the regulatory definitions of storm water discharge associated with large and small construction activity at 40 CFR §122.26(b)(14)(x) and 40 CFR §122.26(b)(15), respectively

“Discharge of Storm Water Associated with Industrial Activity” as used in this Permit, refers to the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant included in the regulatory definition of storm water discharge associated with industrial activity at 40 CFR §122.26(b)(14).

“Discharge-related Activities” include: activities which cause, contribute to, or result in storm water point source pollutant discharges and measures to control storm water discharges, including the siting, construction, and operation of best management practices to control, reduce or prevent storm water pollution.

“Disconnect” for the purposes of this permit, means the change from a direct discharge into receiving waters to one in which the discharged water flows across a vegetated surface, through a constructed water or wetlands feature, through a vegetated swale, or other attenuation or infiltration device before reaching the receiving water.

“Engineered Infiltration” is an underground device or system designed to accept storm water and slowly exfiltrates it into the underlying soil. This device or system is designed based on soil tests that define the infiltration rate.

“Erosion” means the process of carrying away soil particles by the action of water.

“Evaporation” means rainfall that is changed or converted into a vapor.

“Evapotranspiration” means the sum of evaporation and transpiration of water from the earth’s surface to the atmosphere. It includes evaporation of liquid or solid water plus the transpiration from plants.

“Extended Filtration” is a structural storm water device which filters storm water runoff through a soil media and collects it in an underdrain which slowly releases it after the storm is over.

“EPA” means the Environmental Protection Agency Regional Administrator, the EPA Director of the Office of Water and Watersheds, or an authorized representative.

“Entity” means a governmental body, or a public or private organization.

“Existing Permanent Controls,” in the context of this Permit, means post- construction or permanent storm water management controls designed to treat or control runoff on a permanent basis and that were installed prior to the effective date of this Permit.

“Facility or Activity” generally means any NPDES “point source” or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

“Fish Tissue Sampling” see “Methylmercury Fish Tissue Sampling”

“Green infrastructure” means runoff management approaches and technologies that utilize, enhance and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration and reuse.

“Hydromodification” means changes to the storm water runoff characteristics of a watershed caused by changes in land use.

“IDEQ” means the Idaho Department of Environmental Quality or its authorized representative.

“Illicit Connection” means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

“Illicit Discharge” is defined at 40 CFR §122.26(b)(2) and means any discharge to a municipal separate storm sewer that is not entirely composed of storm water, except discharges authorized under an NPDES permit (other than the NPDES Permit for discharges from the MS4) and discharges resulting from fire fighting activities.

“Impaired Water” (or “Water Quality Impaired Water”) for purposes of this Permit means any water body identified by the State of Idaho or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards. Impaired waters include both waters with approved or established Total Maximum Daily Loads (TMDLs), and those for which a TMDL has not yet been approved or established.

“Industrial Activity” as used in this Permit refers to the eleven categories of industrial activities included in the definition of discharges of “storm water associated with industrial activity” at 40 CFR §122.26(b)(14).

“Industrial Storm Water” as used in this Permit refers to storm water runoff associated with the definition of “discharges of storm water associated with industrial activity”.

“Infiltration” is the process by which storm water penetrates into soil.

“Low Impact Development” or “LID” means storm water management and land development techniques, controls and strategies applied at the parcel and subdivision scale that emphasize conservation and use of on-site natural features integrated with engineered, small scale hydrologic controls to more closely mimic pre-development hydrologic functions.

“Major outfall” is defined in 40 CFR §122.26(b)(5) and in general, means a municipal storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more.

“MEP” or "maximum extent practicable," means the technology-based discharge standard for municipal separate storm sewer systems to reduce pollutants in storm water discharges that was established by Section 402(p) of the Clean Water Act, 33 U.S.C §1342(p).

“Measurable Goal” means a quantitative measure of progress in implementing a component of a storm water management program.

“Methylmercury Fish Tissue Sampling” and “Methylmercury Fish Tissue Sampling Requirements” means the IDEQ-recommended cooperative data collection effort for the Lower Boise River Watershed. In particular, Methylmercury Fish Tissue Sampling requirements are otherwise specified in NPDES Permits # ID-002044-3 and ID-002398-1, as issued by EPA to the City of Boise and available online at <http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Current+ID1319>

“Minimize” means to reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry or municipal practices.

“MS4” means "municipal separate storm sewer system," and is used to refer to either a Large, Medium, or Small Municipal Separate Storm Sewer System as defined in 40 CFR 122.26(b). The term, as used within the context of this Permit, refers to those portions of the municipal separate storm sewer systems within the corporate limits of the City of Boise and City of Garden City that are owned and/or operated by the Permittees, namely: Ada County Highway District, Boise State University, City of Boise, City of Garden City, Drainage District #3 and/or the Idaho Transportation Department District #3.

“Municipality” means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the CWA.

“Municipal Separate Storm Sewer” is defined in 40 CFR §122.26(b) and means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to

State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

“National Pollutant Discharge Elimination System” or “NPDES” means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the CWA. The term includes an ‘approved program.’

“New Permanent Controls,” in the context of this Permit, means post- construction or permanent storm water management controls designed to treat or control runoff on a permanent basis that are installed after the effective date of this permit.

“Outfall” is defined at 40 CFR §122.26(b)(9) means a point source (see definition below) at the point where a municipal separate storm sewer discharges to waters of the United States, and does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

“Owner or operator” means the owner or operator of any “facility or activity” subject to regulation under the NPDES program.

“Permanent storm water management controls” see “post-construction storm water management controls.”

“Permitting Authority” means the U.S. Environmental Protection Agency (EPA)

“Point Source” is defined at 40 CFR §122.2 and means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

"Pollutant" is defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

“Pollutant(s) of concern” includes any pollutant identified by IDEQ as a cause of impairment of any water body that will receive a discharge from a MS4 authorized under this Permit. See Table II.C.

“Post- construction storm water management controls” or “permanent storm water management controls” means those controls designed to treat or control runoff on a permanent basis once construction is complete. See also “new permanent controls” and “existing permanent controls.”

“QA/QC” means quality assurance/quality control.

“QAP” means Quality Assurance Plan.

“Rainfall and Rainwater Harvesting” is the collection, conveyance, and storage of rainwater. The scope, method, technologies, system complexity, purpose, and end uses vary from rain barrels for garden irrigation in urban areas, to large-scale collection of rainwater for all domestic uses.

“Redevelopment” for the purposes of this Permit, means the alteration, renewal or restoration of any developed land or property that results in land disturbance of 5,000 square feet or more, and that has one of the following characteristics: land that currently has an existing structure, such as buildings or houses; or land that is currently covered with an impervious surface, such as a parking lot or roof; or land that is currently degraded and is covered with sand, gravel, stones, or other non-vegetative covering.

“Regional Administrator” means the Regional Administrator of Region 10 of the EPA, or the authorized representative of the Regional Administrator.

“Repair of Public Streets, Roads and Parking Lots” means repair work on Permittee-owned or Permittee-managed streets and parking lots that involves land disturbance, including asphalt removal or regrading of 5,000 square feet or more. This definition excludes the following activities: pot hole and square cut patching; overlaying existing asphalt or concrete paving with asphalt or concrete without expanding the area of coverage; shoulder grading; reshaping or regrading drainage ditches; crack or chip sealing; and vegetative maintenance.

“Runoff Reduction Techniques” means the collective assortment of storm water practices that reduce the volume of storm water from discharging off site.

“Storm Sewershed” means, for the purposes of this Permit, all the land area that is drained by a network of municipal separate storm sewer system conveyances to a single point of discharge into a water of the United States.

“Significant contributors of pollutants” means any discharge that causes or could cause or contribute to a violation of surface water quality standards.

“Small Construction Activity” – is defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

“Snow management” means the plowing, relocation and collection of snow.

“Soil amendments” are components added to in situ or native soils to increase the spacing between soil particles so that the soil can absorb and hold more moisture. The amendment of soils changes

various other physical, chemical and biological characteristics so that the soils become more effective in maintaining water quality.

“Source control” storm water management means practices that control storm water *before* pollutants have been introduced into storm water

“Storm event” or “measurable storm event” for the purposes of this Permit means a precipitation event that results in an actual discharge from the outfall and which follows the preceding measurable storm event by at least 48 hours (2 days).

“Storm water” and “storm water runoff” as used in this Permit means storm water runoff, snow melt runoff, and surface runoff and drainage, and is defined at 40 CFR §122.26(b)(13). “Storm water” means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels, or pipes into a defined surface water channel or a constructed infiltration facility.

“Storm Water Control Measure” (SCM) or “storm water control device,” means physical, structural, and/or managerial measures that, when used singly or in combination, reduce the downstream quality and quantity impacts of storm water. Also, SCM means a permit condition used in place of or in conjunction with effluent limitations to prevent or control the discharge of pollutants. This may include a schedule of activities, prohibition of practices, maintenance procedures, or other management practices. SCMs may include, but are not limited to, treatment requirements; operating procedures; practices to control plant site runoff, spillage, leaks, sludge, or waste disposal; or drainage from raw material storage. See “best management practices (BMPs).”

“Storm Water Facility” means a constructed component of a storm water drainage system, designed or constructed to perform a particular function or multiple functions. Storm water facilities include, but are not limited to, pipes, swales, ditches, culverts, street gutters, detention basins, retention basins, constructed wetlands, infiltration devices, catch basins, oil/water separators, sediment basins, and modular pavement.

“Storm Water Management Practice” or “Storm Water Management Control” means practices that manage storm water, including structural and vegetative components of a storm water system.

“Storm Water Management Project” means a project that takes into account the effects on the water quality of the receiving waters and whether a structural storm water control device can be retrofitted to control water quality.

“Storm Water Management Program (SWMP)” refers to a comprehensive program to manage the quality of storm water discharged from the municipal separate storm sewer system. For the purposes of this Permit, the SWMP consists of the actions and activities conducted by the Permittees as required by this Permit and described in the Permittees’ SWMP documentation. A “SWMP document” is the written summary describing the unique and/or cooperative means by which an individual Permittee or entity implements the specific storm water management controls Permittee within their jurisdiction.

“Storm Water Pollution Prevention Plan (SWPPP)” means a site specific plan designed to describe the control of soil, raw materials, or other substances to prevent pollutants in storm water runoff; a SWPPP is generally developed for a construction site, or an industrial facility. For the purposes of this permit, a SWPPP means a written document that identifies potential sources of pollution, describes practices to reduce pollutants in storm water discharges from the site, and identifies procedures or controls that the operator will implement to reduce impacts to water quality and comply with applicable Permit requirements.

“Structural flood control device” means a device designed and installed for the purpose of storm drainage during storm events.

“Subwatershed” for the purposes of this Permit means a smaller geographic section of a larger watershed unit with a drainage area between 2 to 15 square miles and whose boundaries include all the land area draining to a point where two second order streams combine to form a third order stream. A subwatershed may be located entirely within the same political jurisdiction.

“TMDL” means Total Maximum Daily Load, an analysis of pollutant loading to a body of water detailing the sum of the individual waste load allocations for point sources and load allocations for non-point sources and natural background. See 40 CFR §130.2.

“Treatment control” storm water management means practices that ‘treat’ storm water after pollutants have been incorporated into the storm water.

“Urban Agriculture” and “Urban Agricultural Activities” means the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities. For the purposes of this Permit, the term includes activities allowed and/or acknowledged by the Permittees through a local comprehensive plan ordinance, or other regulatory mechanism. For example, see: *Blueprint Boise* online at http://www.cityofboise.org/BluePrintBoise/pdf/Blueprint%20Boise/0_Blueprint_All.pdf, and/or *City of Boise Urban Agriculture ordinance amendment, ZOA11-00006*.

“Waters of the United States,” as defined in 40 CFR 122.2, means:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters, including interstate "wetlands";
3. All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

- c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs 1 through 4 of this definition;
6. The territorial sea; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1 through 6 of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds for steam electric generation stations per 40 CFR Part 423) which also meet the criteria of this definition are not waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

“Watershed” is defined as all the land area that is drained by a waterbody and its tributaries.

“Wetlands” means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

ATTACHMENT 41



Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

NPDES General Permit No. NMR04A000

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"), except as provided in Part I.A.5 of this permit, operators of municipal separate storm sewer systems located in the area specified in Part I.A.1 are authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements set forth herein.

Only operators of municipal separate storm sewer systems in the general permit area who submit a Notice of Intent and a storm water management program document in accordance with Part I.A.6 of this permit are authorized to discharge storm water under this general permit.

This is a renewal NPDES permit issued for these portions of the small municipal separate storm sewer systems covered under the NPDES permit No NMR040000 and NMR040001 and the large municipal separate storm sewer systems covered under the NPDES permit No NMS000101.

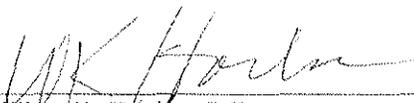
This permit is issued on and shall become effective on the date of publication in the Federal Register.

DEC 22 2014

This permit and the authorization to discharge shall expire at, midnight, December 19, 2019.

Signed by

Prepared by



William K. Honker, P.E.
Director
Water Quality Protection Division



Nelly Smith
Environmental Engineer
NPDES Permits and TMDLs Branch

MIDDLE RIO GRANDE WATERSHED BASED MUNICIPAL SEPARATE STORM SEWER
SYSTEM PERMIT

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PART I. INDIVIDUAL PERMIT CONDITIONS

A. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1. **Permit Area.** This permit is available for MS4 operators within the Middle Rio Grande Sub-Watersheds described in Appendix A. This permit may authorize stormwater discharges to waters of the United States from MS4s within the Middle Rio Grande Watershed provided the MS4:
 - a. Is located fully or partially within the corporate boundary of the City of Albuquerque;
 - b. Is located fully or partially within the Albuquerque urbanized area as determined by the 2000 and 2010 Decennial Census. Maps of Census 2010 urbanized areas are available at: <http://water.epa.gov/polwaste/npdes/stormwater/Urbanized-Area-Maps-for-NPDES-MS4-Phase-II-Stormwater-Permits.cfm>;
 - c. Is designated as a regulated MS4 pursuant to 40 CFR 122.32; or
 - d. This permit may also authorize an operator of a MS4 covered by this permit for discharges from areas of a regulated small MS4 located outside an Urbanized Areas or areas designated by the Director provided the permittee complies with all permit conditions in all areas covered under the permit.
2. **Potentially Eligible MS4s.** MS4s located within the following jurisdictions and other areas, including any designated by the Director, are potentially eligible for authorization under this permit:
 - City of Albuquerque
 - AMAFCA (Albuquerque Metropolitan Arroyo Flood Control Authority)
 - UNM (University of New Mexico)
 - NMDOT (New Mexico Department of Transportation District 3)
 - Bernalillo County
 - Sandoval County
 - Village of Corrales
 - City of Rio Rancho
 - Los Ranchos de Albuquerque
 - KAFB (Kirtland Air Force Base)
 - Town of Bernalillo
 - EXPO (State Fairgrounds/Expo NM)
 - SSCAFCA (Southern Sandoval County Arroyo Flood Control Authority)
 - ESCAFCA (Eastern Sandoval County Arroyo Flood Control Authority)
 - Sandia Laboratories, Department of Energy (DOE)
 - Pueblo of Sandia
 - Pueblo of Isleta
 - Pueblo of Santa Ana
3. **Eligibility.** To be eligible for this permit, the operator of the MS4 must provide:
 - a. **Public Participation:** Prior submitting the Notice of Intent (NOI), the operator of the MS4 must follow the local notice and comment to procedures at Part I.D.5.h.(i).
 - b. **National Historic Preservation Act (NHPA) Eligibility Provisions**

In order to be eligible for coverage under this permit, the applicant must be in compliance with the National Historic Preservation Act. Discharges may be authorized under this permit only if:

- (i) Criterion A: storm water discharges, allowable non-storm water discharges, and discharge-related activities do not affect a property that is listed or is eligible for listing on the National Register of Historic Places as maintained by the Secretary of the Interior; or
- (ii) Criterion B: the applicant has obtained and is in compliance with a written agreement with the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) (or equivalent tribal authority) that outlines all measures the MS4 operator will undertake to mitigate or prevent adverse effect to the historic property.

Appendix C of this permit provides procedures and references to assist with determining permit eligibility concerning this provision. You must document and incorporate the results of your eligibility determination in your SWMP.

The permittee shall also comply with the requirements in Part IV.U.

4. **Authorized Non-Stormwater Discharges.** The following non-stormwater discharges need not be prohibited unless determined by the permittees, U.S. Environmental Protection Agency (EPA), or New Mexico Environment Department (NMED) to be significant contributors of pollutants to the municipal separate storm sewer system (MS4). Any such discharge that is identified as significant contributor pollutants to the MS4, or as causing or contributing to a water quality standards violation, must be addressed as an illicit discharge under the illicit discharge and improper disposal practices established pursuant to Part I.D.5.e of this permit. For all of the discharges listed below, not treated as illicit discharges, the permittee must document the reason these discharges are not expected to be significant contributors of pollutants to the MS4. This documentation may be based on either the nature of the discharge or any pollution prevention/treatment requirements placed on such discharges by the permittee.

- potable water sources, including routine water line flushing;
- lawn, landscape, and other irrigation waters provided all pesticides, herbicides and fertilizers have been applied in accordance with approved manufacturing labeling and any applicable permits for discharges associated with pesticide, herbicide and fertilizer application;
- diverted stream flows;
- rising ground waters;
- uncontaminated groundwater infiltration (as defined at 40 CFR §35.2005 (20));
- uncontaminated pumped groundwater;
- foundation and footing drains;
- air conditioning or compressor condensate;
- springs;
- water from crawl space pumps;
- individual residential car washing;
- flows from riparian habitats and wetlands;
- dechlorinated swimming pool discharges;
- street wash waters that do not contain detergents and where no un-remediated spills or leaks of toxic or hazardous materials have occurred;
- discharges or flows from fire fighting activities (does not include discharges from fire fighting training activities); and,
- other similar occasional incidental non-stormwater discharges (e.g. non-commercial or charity car washes, etc.)

5. **Limitations of Coverage.** This permit does not authorize:

- a. **Non-Storm Water:** Discharges that are mixed with sources of non-storm water unless such non-storm water discharges are:
 - (i) In compliance with a separate NPDES permit; or
 - (ii) Exempt from permitting under the NPDES program; or

- (iii) Determined not to be a substantial contributor of pollutants to waters of the United States. See Part I.A.4.
- b. Industrial Storm Water: Storm water discharges associated with industrial activity as defined in 40 CFR §122.26(b)(14)(i)-(ix) and (xi).
 - c. Construction Storm Water: Storm water discharges associated with construction activity as defined in 40 CFR §122.26(b)(14)(x) or 40 CFR §122.26(b)(15).
 - d. Currently Permitted Discharges: Storm water discharges currently covered under another NPDES permit.
 - e. Discharges Compromising Water Quality: Discharges that EPA, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary in accordance with Part IV.M. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures in your SWMP designed to bring your discharge into compliance with water quality standards.
 - f. Discharges Inconsistent with a TMDL: You are not eligible for coverage under this permit for discharges of pollutants of concern to waters for which there is an applicable total maximum daily load (TMDL) established or approved by EPA unless you incorporate into your SWMP measures or controls that are consistent with the assumptions and requirements of such TMDL. To be eligible for coverage under this general permit, you must incorporate documentation into your SWMP supporting a determination of permit eligibility with regard to waters that have an EPA-established or approved TMDL. If a wasteload allocation has been established that would apply to your discharge, you must comply with the requirements established in Part I.C.2.b.(i). Where an EPA-approved or established TMDL has not specified a wasteload allocation applicable to municipal storm water discharges, but has not specifically excluded these discharges, adherence to a SWMP that meets the requirements in Part I.C.2.b.(ii) of this general permit will be presumed to be consistent with the requirements of the TMDL. If the EPA-approved or established TMDL specifically precludes such discharges, the operator is not eligible for coverage under this general permit.

6. Authorization Under This General Permit

a. Obtaining Permit Coverage.

- (i) An MS4 operator seeking authorization to discharge under this general permit must submit electronically a complete notice of intent (NOI) to the e-mail address provided in Part I.B.3 (see suggested EPA R6 MS4 NOI format located in EPA website at <http://epa.gov/region6/water/npdes/sw/ms4/index.htm>), in accordance with the deadlines in Part I.B.1 of this permit. The NOI must include the information and attachments required by Parts I.B.2, Part I.A.3, Part I.D.5.h.(i), and I.A.5.f of this permit. By submitting a signed NOI, the applicant certifies that all eligibility criteria for permit coverage have been met. If EPA notifies a discharger (either directly, by public notice, or by making information available on the Internet) of other NOI options that become available at a later date, such as electronic submission of forms or information, the MS4 operator may take advantage of those options to satisfy the NOI submittal requirements.
- (ii) If an operator changes or a new operator is added after an NOI has been submitted, the operator must submit a new or revised NOI to EPA.
- (iii) An MS4 operator who submits a complete NOI and meets the eligibility requirements in Part I of this permit is authorized to discharge storm water from the MS4 under the terms and conditions of this general permit only upon written notification by the Director. After review of the NOI and any public comments on the NOI, EPA may condition permit coverage on correcting any deficiencies or on including a schedule to respond to any public comments. (See also Parts I.A.3 and Part I.D.5.h.(i).)

- (iv) If EPA notifies the MS4 operator of deficiencies or inadequacies in any portion of the NOI (including the SWMP), the MS4 operator must correct the deficient or inadequate portions and submit a written statement to EPA certifying that appropriate changes have been made. The certification must be submitted within the time-frame specified by EPA and must specify how the NOI has been amended to address the identified concerns.
- (v) The NOI must be signed and certified in accordance with Parts IV.H.1 and 4. Signature for the NOI, which effectively takes the place of an individual permit application, may not be delegated to a lower level under Part IV.H.2

b. Terminating Coverage.

- (i) A permittee may terminate coverage under this general permit by submitting a notice of termination (NOT). Authorization to discharge terminates at midnight on the day the NOT is post-marked for delivery to EPA.
- (ii) A permittee must submit an NOT to EPA within 30 days after the permittee:
 - (a) Ceases discharging storm water from the MS4,
 - (b) Ceases operations at the MS4, or
 - (c) Transfers ownership of or responsibility for the facility to another operator.
- (iii) The NOT will consist of a letter to EPA and must include the following information:
 - (a) Name, mailing address, and location of the MS4 for which the notification is submitted;
 - (b) The name, address and telephone number of the operator addressed by the NOT;
 - (c) The NPDES permit number for the MS4;
 - (d) An indication of whether another operator has assumed responsibility for the MS4, the discharger has ceased operations at the MS4, or the storm water discharges have been eliminated; and
 - (e) The following certification:

I certify under penalty of law that all storm water discharges from the identified MS4 that are authorized by an NPDES general permit have been eliminated, or that I am no longer the operator of the MS4, or that I have ceased operations at the MS4. I understand that by submitting this Notice of Termination I am no longer authorized to discharge storm water under this general permit, and that discharging pollutants in storm water to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by an NPDES permit. I also understand that the submission of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.
 - (f) NOTs, signed in accordance with Part IV.H.1 of this permit, must be sent to the e-mail address in Part I.B.3. Electronic submittal of the NOT required in the permit using a compatible Integrated Compliance Information System (ICIS) format would be allowed if available.

B. NOTICE OF INTENT REQUIREMENTS

1. Deadlines for Notification.

- a. Designations: Small MS4s automatically designated under 40 CFR 122.32(a)(1), large MS4s located within the corporate boundary of the COA including the COA and former co-permittees under the NPDES permit No

NMS000101, and MS4s designated under 40 CFR 122.26(a)(1)(v), 40 CFR 122.26(a)(9)(i)(C) or (D), or 40 CFR 122.32(a)(2) are required to submit individual NOIs by the dates listed in Table 1. Any MS4 designated as needing a permit after issuance of this permit will be given an individualized deadline for NOI submittal by the Director at the time of designation.

In lieu of creating duplicate program elements for each individual permittee, implementation of the SWMP, as required in Part I.D, may be achieved through participation with other permittees, public agencies, or private entities in cooperative efforts to satisfy the requirements of Part D. For these programs with cooperative elements, the permittee may submit individual NOIs as established in Table 1. See also "Permittees with Cooperative Elements in their SWMP" under Part I.B.4 and "Shared Responsibilities and Cooperative Programs" under Part I.D.3.

Table 1 Deadlines to Submit NOI

Permittee Class Type	NOI Deadlines
Class A: MS4s within the Cooperate Boundary of the COA including former co-permittees under the NPDES permit No NMS000101	90 days from effective date of the permit or 180 days from effective date of the permit if participating in cooperative programs for one or more program elements.
Class B: MS4s designated under 40 CFR 122.32(a)(1). Based on 2000 Decennial Census Map	90 days from effective date of the permit or 180 days from effective date of the permit if participating in cooperative programs for one or more program elements.
Class C: MS4s designated under 40 CFR 122.26(a)(1)(v), 40 CFR 122.26(a)(9)(i)(C) or (D), or 40 CFR 122.32(a)(2) or MS4s newly designated under 122.32(a)(1) based on 2010 Decennial Census Map	180 days from effective date of the permit or notice of designation, unless the notice of designation grants a later date or; 180 days from effective date of the permit if participating in cooperative programs for one or more program elements.
Class D: MS4s within Indian Country Lands designated under 40 CFR 122.26(a)(1)(v), 122.26(a)(9)(i)(C) or (D), 122.32(a)(1), or 122.32(a)(2)	180 days from effective date of the permit or notice of designation, unless the notice of designation grants a later date or; 180 days from effective date of the permit if participating in cooperative programs for one or more program elements.

See Appendix A for list of potential permittees in the Middle Rio Grande Watershed

- b. New Operators. For new operators of all or a part of an already permitted MS4 (due to change on operator or expansion of the MS4) who will take over implementation of the existing SWMP covering those areas, the NOI must be submitted 30 days prior to taking over operational control of the MS4. Existing permittees who are expanding coverage of their MS4 area (e.g., city annexes part of unincorporated county MS4) are not required to submit a new NOI, but must comply with Part I.D.6.d.
- c. Submitting a Late NOI. MS4s not able to meet the NOI deadline in Table 1 and Part I.B.1.b due to delays in determining eligibility should notify EPA of the circumstance and progress to date at the address in Part I.B.3 and then proceed with a late NOI. MS4 operators are not prohibited from submitting an NOI after the dates provided in Table 1 and Part I.B.1.b. If a late NOI is submitted, the authorization is only for discharges that occur after permit coverage is effective. The permitting authority reserves the right to take appropriate enforcement actions for any unpermitted discharges.
- d. End of Administrative Continued Coverage under Previous Permit. Administrative continuance is triggered by a timely reapplication. Discharges submitting an NOI for coverage under this permit are considered to have met

the timely reapplication requirement if NOI is submitted by the deadlines included in Table 1 of Part I.B.1. For MS4s previously covered under either NMS000101 or NMR040000, continued coverage under those permits ends: a) the day after the applicable deadline for submittal of an NOI if a complete NOI has not been submitted or b) upon notice of authorization under this permit if a complete and timely NOI is submitted.

2. **Contents of Notice of Intent.** An MS4 operator eligible for coverage under this general permit must submit an NOI to discharge under this general permit. The NOI will consist of a letter to EPA containing the following information (see suggested EPA R6 MS4 NOI Format located in EPA website at <http://www.epa.gov/region6/water/npdes/sw/ms4/index.htm>) and must be signed in accordance with Part IV.H of this permit:
 - a. The legal name of the MS4 operator and the name of the urbanized area and core municipality (or Indian reservation/pueblo) in which the operator's MS4 is located;
 - b. The full facility mailing address and telephone number;
 - c. The name and phone number of the person or persons responsible for overall coordination of the SWMP;
 - d. An attached location map showing the boundaries of the MS4 under the applicant's jurisdiction. The map must include streets or other demarcations so that the exact boundaries can be located;
 - e. The area of land served by the applicant's MS4 (in square miles);
 - f. The latitude and longitude of the approximate center of the MS4;
 - g. The name(s) of the waters of the United States that receive discharges from the system.
 - h. If the applicant is participating in a cooperative program element or is relying on another entity to satisfy one or more permit obligations (see Part I.D.3), identify the entity(ies) and the element(s) the entity(ies) will be implementing;
 - i. Information on each of the storm water minimum control measures in Part I.D.5 of this permit and how the SWMP will reduce pollutants in discharges to the Maximum Extent Practicable. For each minimum control measure, include the following:
 - (i) Description of the best management practices (BMPs) that will be implemented;
 - (ii) Measurable goals for each BMP; and
 - (iii) Time frames (i.e., month and year) for implementing each BMP;
 - j. Based on the requirements of Part I.A.3.b describe how the eligibility criteria for historic properties have been met;
 - k. Indicate whether or not the MS4 discharges to a receiving water for which EPA has approved or developed a TMDL. If so, describe how the eligibility requirements of Part I.A.5.f and Part I.C.2 have been met.

Note: If an individual permittee or a group of permittees seeks an alternative sub-measurable goal for TMDL controls under Part I.C.2.b.(i).(c).B, the permittee or a group of permittees must submit a preliminary proposal with the NOI. This proposal shall include, but is not limited to, the elements included in Appendix B under Section B.2.
 - l. Signature and certification by an appropriate official (see Part IV.H). The NOI must include the certification statement from Part IV.H.4.

3. **Where to Submit.** The MS4 operator must submit the signed NOI to EPA via e-mail at R6_MS4Permits@epa.gov (note: there is an underscore between R6 and MS4) and NMED to the address provided in Part III.D.4. See also Part III.D.4 to determine if a copy must be provided to a Tribal agency.

The following MS4 operators: AMAFCA, Sandoval County, Village of Corrales, City of Rio Rancho, Town of Bernalillo, SSCAFCA, and ESCAFCA must submit the signed NOI to the Pueblo of Sandia to the address provided in Part III.D.4.

Note: See suggested EPA R6 MS4 NOI Format located in EPA website at <http://www.epa.gov/region6/water/npdes/sw/ms4/index.htm>. A complete copy of the signed NOI should be maintained on site. Electronic submittal of the documents required in the permit using a compatible Integrated Compliance Information System (ICIS) format would be allowed if available.

4. **Permittees with Cooperative Elements in their SWMP.** Any MS4 that meets the requirements of Part I.A of this general permit may choose to partner with one or more other regulated MS4 to develop and implement a SWMP or SWMP element. The partnering MS4s must submit separate NOIs and have their own SWMP, which may incorporate jointly developed program elements. If responsibilities are being shared as provided in Part I.D.3 of this permit, the SWMP must describe which permittees are responsible for implementing which aspects of each of the minimum measures. All MS4 permittees are subject to the provisions in Part I.D.6.

Each individual MS4 in a joint agreement implementing a permit condition will be independently assessed for compliance with the terms of the joint agreement. Compliance with that individual MS4s obligations under the joint agreement will be deemed compliance with that permit condition. Should one or more individual MS4s fail to comply with the joint agreement, causing the joint agreement program to fail to meet the requirements of the permit, the obligation of all parties to the joint agreement is to develop within 30 days and implement within 90 days an alternative program to satisfy the terms of the permit.

C. SPECIAL CONDITIONS

1. **Compliance with Water Quality Standards.** Pursuant to Clean Water Act §402(p)(3)(B)(iii) and 40 CFR §122.44(d)(1), this permit includes provisions to ensure that discharges from the permittee's MS4 do not cause or contribute to exceedances of applicable surface water quality standards, in addition to requirements to control discharges to the maximum extent practicable (MEP) set forth in Part I.D. Permittees shall address stormwater management through development of the SWMP that shall include the following elements and specific requirements included in Part VI.
 - a. Permittee's discharges shall not cause or contribute to an exceedance of surface water quality standards (including numeric and narrative water quality criteria) applicable to the receiving waters. In determining whether the SWMP is effective in meeting this requirement or if enhancements to the plan are needed, the permittee shall consider available monitoring data, visual assessment, and site inspection reports.
 - b. Applicable surface water quality standards for discharges from the permittees' MS4 are those that are approved by EPA and any other subsequent modifications approved by EPA upon the effective date of this permit found at New Mexico Administrative Code §20.6.4. Discharges from various portions of the MS4 also flow downstream into waters with Pueblo of Isleta and Pueblo of Sandia Water Quality Standards;
 - c. The permittee shall notify EPA and the Pueblo of Isleta in writing as soon as practical but not later than thirty (30) calendar days following each Pueblo of Isleta water quality standard exceedance at an in-stream sampling location. In the event that EPA determines that a discharge from the MS4 causes or contributes to an exceedance of applicable surface water quality standards and notifies the permittee of such an exceedance, the permittee shall, within sixty (60) days of notification, submit to EPA, NMED, Pueblo of Isleta (upon request) and Pueblo of Sandia (upon request), a report that describes controls that are currently being implemented and additional controls that will be implemented to prevent pollutants sufficient to ensure that the discharge will no longer cause or contribute to an exceedance of applicable surface water quality standards. The permittee shall implement such additional controls upon notification by EPA and shall incorporate such measures into their SWMP as described in Part I.D of this permit. NMED or the affected Tribe may provide information

documenting exceedances of applicable water quality standards caused or contributed to by the discharges authorized by this permit to EPA Region 6 and request EPA take action under this paragraph.

- d. Phase I Dissolved Oxygen Program (Applicable only to the COA and AMAFCA as a continuation of program in 2012 NMS000101 individual permit): Within one year from effective date of the permit, the permittees shall revise the May 1, 2012 Strategy to continue taking measures to address concerns regarding discharges to the Rio Grande by implementing controls to eliminate conditions that cause or contribute to exceedances of applicable dissolved oxygen water quality standards in waters of the United States. The permittees shall:
- (i) Continue identifying structural elements, natural or man-made topographical and geographical formations, MS4 operations activities, or oxygen demanding pollutants contributing to reduced dissolved oxygen in the receiving waters of the Rio Grande. Both dry and wet weather discharges shall be addressed. Assessment may be made using available data or collecting additional data;
 - (ii) Continue implementing controls, and updating/revising as necessary, to eliminate structural elements or the discharge of pollutants at levels that cause or contribute to exceedances of applicable water quality standards for dissolved oxygen in waters of the United States;
 - (iii) To verify the remedial action in the North Diversion Channel Embayment, the COA and AMAFCA shall continue sampling for DO and temperature until the data indicate the discharge does not exceed applicable dissolved oxygen water quality standards in waters of the United States; and
 - (iv) Submit a revised strategy to FWS for consultation and EPA for approval from a year of effective date of the permit and progress reports with the subsequent Annual Reports. Progress reports to include:
 - (a) Summary of data.
 - (b) Activities undertaken to identify MS4 discharge contribution to exceedances of applicable dissolved oxygen water quality standards in waters of the United States. Including summary of findings of the assessment required in Part I.C.1.d.(i).
 - (c) Conclusions drawn, including support for any determinations.
 - (d) Activities undertaken to eliminate MS4 discharge contribution to exceedances of applicable dissolved oxygen water quality standards in waters of the United States.
 - (e) Account of stakeholder involvement.
- e. PCBs (Applicable only to the COA and AMAFCA as a continuation of program in 2012 NMS000101 individual permit and Bernalillo County): The permittee shall address concerns regarding PCBs in channel drainage areas specified in Part I.C.1.e.(vi) by developing or continue updating/revising and implementing a strategy to identify and eliminate controllable sources of PCBs that cause or contribute to exceedances of applicable water quality standards in waters of the United States. Bernalillo County shall submit the proposed PCB strategy to EPA within two (2) years from the effective date of the permit and submit a progress report with the third and with subsequent Annual Reports. COA and AMAFCA shall submit a progress report with the first and with the subsequent Annual Reports. The progress reports shall include:
- (i) Summary of data.
 - (ii) Findings regarding controllable sources of PCBs in the channel drainages area specified in Part I.C.1.e.(vi) that cause or contribute to exceedances of applicable water quality standards in waters of the United States via the discharge of municipal stormwater.
 - (iii) Conclusions drawn, including supporting information for any determinations.

(iv) Activities undertaken to eliminate controllable sources of PCBs in the drainage areas specified in Part I.C.1.e.(vi) that cause or contribute to exceedances of applicable water quality standards in waters of the United States via the discharge of municipal stormwater including proposed activities that extend beyond the five (5) year permit term.

(v) Account of stakeholder involvement in the process.

(vi) Channel Drainage Areas: The PCB strategy required in Part I.C.1.e is only applicable to:

COA and AMAFCA Channel Drainage Areas:

- San Jose Drain
- North Diversion Channel

Bernalillo County Channel Drainage Areas:

- Adobe Acres Drain
- Alameda Outfall Channel
- Paseo del Norte Outfall Channel
- Sanchez Farm Drainage Area

A cooperative strategy to address PCBs in the COA, AMAFCA and Bernalillo County's drainage areas may be developed between Bernalillo County, AMAFCA, and the COA. If a cooperative strategy is developed, the cooperative strategy shall be submitted to EPA within three (3) years from the effective date of the permit and submit a progress report with the fourth and with subsequent Annual Reports,

Note: COA and AMAFCA must continue implementing the existing PCB strategy until a new Cooperative PCB Strategy is submitted to EPA.

- f. Temperature (Applicable only to the COA and AMAFCA as a continuation of program in 2012 NMS000101 individual permit): The permittees must continue assessing the potential effect of stormwater discharges in the Rio Grande by collecting and evaluating additional data. If the data indicates there is a potential of stormwater discharges contributing to exceedances of applicable temperature water quality standards in waters of the United States, within thirty (30) days such as findings, the permittees must develop and implement a strategy to eliminate conditions that cause or contribute to these exceedances. The strategy must include:
- (i) Identify structural controls, post construction design standards, or pollutants contributing to raised temperatures in the receiving waters of the Rio Grande. Both dry and wet weather discharges shall be addressed. Assessment may be made using available data or collecting additional data;
 - (ii) Develop and implement controls to eliminate structural controls, post construction design standards, or the discharge of pollutants at levels that cause or contribute to exceedances of applicable water quality standards for temperature in waters of the United States; and
 - (iii) Provide a progress report with the first and with subsequent Annual Reports. The progress reports shall include:
 - (a) Summary of data.
 - (b) Activities undertaken to identify MS4 discharge contribution to exceedances of applicable temperature water quality standards in waters of the United States.
 - (c) Conclusions drawn, including supporting information for any determinations.
 - (d) Activities undertaken to reduce MS4 discharge contribution to exceedances of applicable temperature water quality standards in waters of the United States.
 - (e) Accounting of stakeholder involvement.

2. **Discharges to Impaired Waters with and without approved TMDLs.** Impaired waters are those that have been identified pursuant to Section 303(d) of the Clean Water Act as not meeting applicable surface water quality standards. This may include both waters with EPA-approved Total Maximum Daily Loads (TMDLs) and those for which a TMDL has not yet been approved. For the purposes of this permit, the conditions for discharges to impaired waters also extend to controlling pollutants in MS4 discharges to tributaries to the listed impaired waters in the Middle Rio Grande watershed boundary identified in Appendix A.
 - a. Discharges of pollutant(s) of concern to impaired water bodies for which there is an EPA approved total maximum daily load (TMDL) are not eligible for this general permit unless they are consistent with the approved TMDL. A water body is considered impaired for the purposes of this permit if it has been identified, pursuant to the latest EPA approved CWA §303(d) list, as not meeting New Mexico Surface Water Quality Standards.
 - b. The permittee shall control the discharges of pollutant(s) of concern to impaired waters and waters with approved TMDLs as provided in sections (i) and (ii) below, and shall assess the success in controlling those pollutants.
 - (i) **Discharges to Water Quality Impaired Water Bodies with an Approved TMDL**

If the permittee discharges to an impaired water body with an approved TMDL (see Appendix B), where stormwater has the potential to cause or contribute to the impairment, the permittee shall include in the SWMP controls targeting the pollutant(s) of concern along with any additional or modified controls required in the TMDL and this section. The SWMP and required annual reports must include information on implementing any focused controls required to reduce the pollutant(s) of concern as described below:

 - (a) Targeted Controls: The SWMP submitted with the first annual report must include a detailed description of all targeted controls to be implemented, such as identifying areas of focused effort or implementing additional Best Management Practices (BMPs) that will be implemented to reduce the pollutant(s) of concern in the impaired waters.
 - (b) Measurable Goals: For each targeted control, the SWMP must include a measurable goal and an implementation schedule describing BMPs to be implemented during each year of the permit term. Where the impairment is for bacteria, the permittee must, at minimum comply with the activities and schedules described in Table 1.a of Part I.C.2.(iii).
 - (c) Identification of Measurable Goal: The SWMP must identify a measurable goal for the pollutant(s) of concern. The value of the measurable goal must be based on one of the following options:
 - A. If the permittee is subject to a TMDL that identifies an aggregate Waste Load Allocation (WLA) for all or a class of permitted MS4 stormwater sources, then the SWMP may identify such WLA as the measurable goal. Where an aggregate WLA measurable goal is used, all affected MS4 operators are jointly responsible for progress in meeting the measurable goal and shall (jointly or individually) develop a monitoring/assessment plan. This program element may be coordinated with the monitoring required in Part III.A.
 - B. Alternatively, if multiple permittees are discharging into the same impaired water body with an approved TMDL (which has an aggregate WLA for all permitted stormwater MS4s), the MS4s may combine or share efforts, in consultation with/and the approval of NMED, to determine an alternative sub-measurable goal derived from the WLA for the pollutant(s) of concern (e.g., bacteria) for their respective MS4. The SWMP must clearly define this alternative approach and must describe how the sub-measurable goals would cumulatively support the aggregate WLA. Where an aggregate WLA measurable goal has been broken into sub-measurable goals for individual MS4s, each permittee is only responsible for progress in meeting its WLA sub-measurable goal.

- C. If the permittee is subject to an individual WLA specifically assigned to that permittee, the measurable goal must be the assigned WLA. Where WLAs have been individually assigned, or where the permittee is the only regulated MS4 within the urbanized area that is discharging into the impaired watershed with an approved TMDL, the permittee is only responsible for progress in meeting its WLA measurable goal.
- (d) Annual Report: The annual report must include an analysis of how the selected BMPs have been effective in contributing to achieving the measurable goal and shall include graphic representation of pollutant trends, along with computations of annual percent reductions achieved from the baseline loads and comparisons with the target loads.
- (e) Impairment for Bacteria: If the pollutant of concern is bacteria, the permittee shall include focused BMPs addressing the five areas below, as applicable, in the SWMP and implement as appropriate. If a TMDL Implementation Plan (a plan created by the State or a Tribe) is available, the permittee may refer to the TMDL Implementation Plan for appropriate BMPs. The SWMP and annual report must include justification for not implementing a particular BMP included in the TMDL Implementation Plan. The permittee may not exclude BMPs associated with the minimum control measures required under 40 CFR §122.34 from their list of proposed BMPs. The BMPs shall, as appropriate, address the following:
- A. Sanitary Sewer Systems
 - Make improvements to sanitary sewers;
 - Address lift station inadequacies;
 - Identify and implement operation and maintenance procedures;
 - Improve reporting of violations; and
 - Strengthen controls designed to prevent over flows
 - B. On-site Sewage Facilities (for entities with appropriate jurisdiction)
 - Identify and address failing systems; and
 - Address inadequate maintenance of On-Site Sewage Facilities (OSSFs).
 - C. Illicit Discharges and Dumping
 - Place additional effort to reduce waste sources of bacteria; for example, from septic systems, grease traps, and grit traps.
 - D. Animal Sources
 - Expand existing management programs to identify and target animal sources such as zoos, pet waste, and horse stables.
 - E. Residential Education: Increase focus to educate residents on:
 - Bacteria discharging from a residential site either during runoff events or directly;
 - Fats, oils, and grease clogging sanitary sewer lines and resulting overflows;
 - Decorative ponds; and
 - Pet waste.
- (f) Monitoring or Assessment of Progress: The permittee shall monitor or assess progress in achieving measurable goals and determining the effectiveness of BMPs, and shall include documentation of this monitoring or assessment in the SWMP and annual reports. In addition, the SWMP must include methods to be used. This program element may be coordinated with the monitoring required in Part III.A. The permittee may use the following methods either individually or in conjunction to evaluate progress towards the measurable goal and improvements in water quality as follows:
- A. Evaluating Program Implementation Measures: The permittee may evaluate and report progress towards the measurable goal by describing the activities and BMPs implemented, by identifying the appropriateness of the identified BMPs, and by evaluating the success of implementing the measurable goals. The permittee may assess progress by using program implementation indicators

such as: (1) number of sources identified or eliminated; (2) decrease in number of illegal dumping; (3) increase in illegal dumping reporting; (4) number of educational opportunities conducted; (5) reductions in SSOs; or, 6) increase in illegal discharge detection through dry screening, etc.; and

B. Assessing Improvements in Water Quality: The permittee may assess improvements in water quality by using available data for segment and assessment units of water bodies from other reliable sources, or by proposing and justifying a different approach such as collecting additional instream or outfall monitoring data, etc. Data may be acquired from NMED, local river authorities, partnerships, and/or other local efforts as appropriate. Progress towards achieving the measurable goal shall be reported in the annual report. Annual reports shall report the measurable goal and the year(s) during the permit term that the MS4 conducted additional sampling or other assessment activities.

(g) Observing no Progress towards the Measurable Goal: If, by the end of the third year from the effective date of the permit, the permittee observes no progress toward the measurable goal either from program implementation or water quality assessments, the permittee shall identify alternative focused BMPs that address new or increased efforts towards the measurable goal. As appropriate, the MS4 may develop a new approach to identify the most significant sources of the pollutant(s) of concern and shall develop alternative focused BMPs (this may also include information that identifies issues beyond the MS4's control). These revised BMPs must be included in the SWMP and subsequent annual reports.

Where the permittee originally used a measurable goal based on an aggregated WLA, the permittee may combine or share efforts with other MS4s discharging to the same impaired stream segment to determine an alternative sub-measurable goal for the pollutant(s) of concern for their respective MS4s, as described in Part I.C.2.b.(i).(c).B above. Permittees must document, in their SWMP for the next permit term, the proposed schedule for the development and subsequent adoption of alternative sub-measurable goals for the pollutant(s) of concern for their respective MS4s and associated assessment of progress in meeting those individual goals.

(ii) Discharges Directly to Water Quality Impaired Water Bodies without an Approved TMDL:

The permittee shall also determine whether the permitted discharge is directly to one or more water quality impaired water bodies where a TMDL has not yet been approved by NMED and EPA. If the permittee discharges directly into an impaired water body without an approved TMDL, the permittee shall perform the following activities:

(a) Discharging a Pollutant of Concern: The permittee shall:

A. Determine whether the MS4 may be a source of the pollutant(s) of concern by referring to the CWA §303(d) list and then determining if discharges from the MS4 would be likely to contain the pollutant(s) of concern at levels of concern. The evaluation of CWA §303(d) list parameters should be carried out based on an analysis of existing data (e.g., Illicit Discharge and Improper Disposal Program) conducted within the permittee's jurisdiction.

B. Ensure that the SWMP includes focused BMPs, along with corresponding measurable goals, that the permittee will implement, to reduce, the discharge of pollutant(s) of concern that contribute to the impairment of the water body. (note: Only applicable if the permittee determines that the MS4 may discharge the pollutant(s) of concern to an impaired water body without a TMDL. The SWMP submitted with the first annual report must include a detailed description of proposed controls to be implemented along with corresponding measurable goals.

C. Amend the SWMP to include any additional BMPs to address the pollutant(s) of concern.

(b) Impairment for Bacteria: Where the impairment is for bacteria, the permittee shall identify potential significant sources and develop and implement targeted BMPs to control bacteria from those sources (see Part I.C.2.b.(i).(e).A through E.. The permittee must, at minimum comply with the activities and

schedules described in Table 1.a of Part I.C.2.(iii). The annual report must include information on compliance with this section, including results of any sampling conducted by the permittee.

Note: Probable pollutant sources identified by permittees should be submitted to NMED on the following form: <ftp://ftp.nmenv.state.nm.us/www/swqb/Surveys/PublicProbableSourceIDSurvey.pdf>

- (c) Impairment for Nutrients: Where the impairment is for nutrients (e.g., nitrogen or phosphorus), the permittee shall identify potential significant sources and develop and implement targeted BMPs to control nutrients from potential sources. The permittee must, at minimum comply with the activities and schedules described in Table 1.b of Part I.C.2, (iii). The annual report must include information on compliance with this section, including results of any sampling conducted by the permittee.
- (d) Impairment for Dissolved Oxygen: See Endangered Species Act (ESA) Requirements in Part I.C.3. These program elements may be coordinated with the monitoring required in Part III.A.

(iii) Program Development and Implementation Schedules: Where the impairment is for nutrient constituent (e.g., nitrogen or phosphorus) or bacteria, the permittee must at minimum comply with the activities and schedules in Table 1.a and Table 1.b.

Table 1.a. Pre-TMDL Bacteria Program Development and Implementation Schedules

Activity	Class Permittee				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Identify potential significant sources of the pollutant of concern entering your MS4	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Sixteen (16) months from effective date of permit
Develop (or modify an existing program ***) and implement a public education program to reduce the discharge of bacteria in municipal storm water contributed by (if applicable) by pets, recreational and exhibition livestock, and zoos.	Twelve (12) months from effective date of permit	Twelve (12) months from effective date of permit	Fourteen (14) months from effective date of permit	Fourteen (14) months from effective date of permit	Sixteen (16) months from effective date of permit
Develop (or modify an existing program ***) and implement a program to reduce the discharge of bacteria in municipal storm water contributed by areas within your MS4 served by on-site wastewater treatment systems.	Fourteen (14) months from effective date of permit	Fourteen (14) months from effective date of permit	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit
Review results to date from the Illicit Discharge Detection and Elimination program (see Part I.D.5.e) and modify as necessary to prioritize the detection and elimination of discharges contributing bacteria to the MS4	Fourteen (14) months from effective date of permit	Fourteen (14) months from effective date of permit	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit

Develop (or modify an existing program ***) and implement a program to reduce the discharge of bacteria in municipal storm water contributed by other significant source identified in the Illicit Discharge Detection and Elimination program (see Part I.D.5.c)	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit	Eighteen (18) months from effective date of permit	Twenty (20) months from effective date of permit
Include in the Annual Reports progress on program implementation and reducing the bacteria and updates their measurable goals as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs

(**) or MS4s designated by the Director

(***) Permittees previously covered under permit NMS000101 or NMR040000

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

Table 1.b. Pre-TMDL Nutrient Program Development and Implementation Schedules

Activity	Class Permittee				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Identify potential significant sources of the pollutant of concern entering your MS4	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Sixteen (16) months from effective date of permit
Develop (or modify an existing program ***) and implement a public education program to reduce the discharge of pollutant of concern in municipal storm water contributed by residential and commercial use of fertilizer	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Sixteen (16) months from effective date of permit
Develop (or modify an existing program ***) and implement a program to reduce the discharge of the pollutant of concern in municipal storm water contributed by fertilizer use at municipal operations (e.g., parks, roadways, municipal facilities)	One (1) year from effective date of permit	One (1) year from effective date of permit	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit

Develop (or modify an existing program ***) and implement a program to reduce the discharge of the pollutant of concern in municipal storm water contributed by municipal and private golf courses within your jurisdiction	One (1) year from effective date of permit	One (1) year from effective date of permit	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit
Develop (or modify an existing program ***) and implement a program to reduce the discharge of the pollutant of concern in municipal storm water contributed by other significant source identified in the Illicit Discharge Detection and Elimination program (see Part I.D.5.e)	One (1) year from effective date of permit	One (1) year from effective date of permit	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit
Include in the Annual Reports progress on program implementation and reducing the nutrient pollutant of concern and updates their measurable goals	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs

(**) or MS4s designated by the Director

(***) Permittees previously covered under permit NMS000101 or NMR040000

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

These program elements may be coordinated with the monitoring required in Part III.A.

3. **Endangered Species Act (ESA) Requirements.** Consistent with U.S. FWS Biological Opinion dated August 21, 2014 to ensure actions required by this permit are not likely to jeopardize the continued existence of any currently listed as endangered or threatened species or adversely affect its critical habitat, permittees shall meet the following requirements and include them in the SWMP:

a. Dissolved Oxygen Strategy in the Receiving Waters of the Rio Grande:

- (i) The permittees must identify (or continue identifying if previously covered under permit NMS000101) structural controls, natural or man-made topographical and geographical formations, MS4 operations, or oxygen demanding pollutants contributing to reduced dissolved oxygen in the receiving waters of the Rio Grande. The permittees shall implement controls, and update/revise as necessary, to eliminate discharge of pollutants at levels that cause or contribute to exceedances of applicable water quality standards for dissolved oxygen in waters of the Rio Grande. The permittees shall submit a summary of findings and a summary of activities undertaken under Part I.C.3.a.(i) with each Annual Report. The SWMP submitted with the first and fourth annual reports must include a detailed description of controls implemented (or/and proposed control to be implemented) along with corresponding measurable goals. (Applicable to all permittees).
- (ii) As required in Part I.C.I.d, the COA and AMAFCA shall revise the May 1, 2012 Strategy for dissolved oxygen to address dissolved oxygen at the North Diversion Channel Embayment and/or other MS4 locations. The permittees shall submit the revised strategy to FWS and EPA for approval within a year of permit issuance and progress reports with the subsequent Annual Reports (see also Part I.C.I.d.(iv)). The permittees shall ensure that actions to reduce pollutants or remedial activities selected for the North Diversion Channel Embayment and its watershed are implemented such that there is a reduction in

frequency and magnitude of all low oxygen storm water discharge events that occur in the Embayment or downstream in the MRG as indicated in Table 1.c. Actions to meet the year 3 measurable goals must be taken within 2 years from the effective date of the permit. Actions to meet the year 5 measurable goals must be taken within 4 years from the effective date of the permit.

Table 1.c Measurable Goals of Anoxic and Hypoxia Levels Measured by Permit Year

<i>Permit Year</i>	<i>Anoxic Events*, max</i>	<i>Hypoxic Events**, max</i>
<i>Year 1</i>	<i>18</i>	<i>36</i>
<i>Year 2</i>	<i>18</i>	<i>36</i>
<i>Year 3</i>	<i>9</i>	<i>18</i>
<i>Year 4</i>	<i>9</i>	<i>18</i>
<i>Year 5</i>	<i>4</i>	<i>9</i>

Notes:

- * Anoxic Events: See Appendix G, for oxygen saturation and dissolved oxygen concentrations at various water temperatures and atmospheric pressures for the North Diversion Channel area that are considered anoxic and associated with the Rio Grande Silvery minnow lethality.
- ** Hypoxic Events: See Appendix for G, for oxygen saturation and dissolved oxygen concentrations at various water temperatures and atmospheric pressures for the North Diversion Channel area that are considered hypoxic and associated with the Rio Grande silvery minnow harassment.

(a) The revised strategy shall include:

- A. A Monitoring Plan describing all procedures necessary to continue conducting continuous monitoring of dissolved oxygen (DO) and temperature in the North Diversion Channel Embayment and at one (1) location in the Rio Grande downstream of the mouth of the North Diversion Channel within the action area (e.g., Central Bridge). The monitoring plan to be developed will describe the methodology used to assure its quality, and will identify the means necessary to address any gaps that occur during monitoring, in a timely manner (that is, within 24 to 48 hours).
- B. A Quality Assurance and Quality Control (QA/QC) Plan describing all standard operating procedures, quality assurance and quality control plans, maintenance, and implementation schedules that will assure timely and accurate collection and reporting of water temperature, dissolved oxygen, oxygen saturation, and flow. The QA/QC plan should include all procedures for estimating oxygen data when any oxygen monitoring equipment fail. Until a monitoring plan with quality assurance and quality control is submitted by EPA, any data, including any provisional or incomplete data from the most recent measurement period (e.g. if inoperative monitoring equipment for one day, use data from previous day) shall be used as substitutes for all values in the calculations for determinations of incidental takes. Given the nature of the data collected as surrogate for incidental take, all data, even provisional data (e.g., oxygen/water temperature data, associated metadata such as flows, date, times), shall be provided to the Service in a spreadsheet or database format within two weeks after formal request.

(b) Reporting: The COA and AMAFCA shall provide

- A. An Annual Incidental Take Report to EPA and the Service that includes the following information: beginning and end date of any qualifying stormwater events, dissolved oxygen values and water temperature in the North Diversion Channel Embayment, dissolved oxygen values and water temperature at a downstream monitoring station in the MRG, flow rate in the North Diversion Channel, mean daily flow rate in the MRG, evaluation of oxygen and temperature data

as either anoxic or hypoxic using Table 2 of the BO, and estimate the number of silvery minnows taken based on Appendix A of the BO. Electronic copy of The Annual Incidental Take Report should be provided with the Annual Report required under Part III.B no later than December 1 for the proceeding calendar year.

- B. A summary of data and findings with each Annual Report to EPA and the Service. All data collected (including provisional oxygen and water temperature data, and associated metadata), transferred, stored, summarized, and evaluated shall be included in the Annual Report. If additional data is requested by EPA or the Service, The COA and AMAFCA shall provide such as information within two weeks upon request,

The revised strategy required under Part I.C.3.a.(ii), the Annual Incidental Take Reports required under Part I.C.3.a.(ii).(b).A, and Annual Reports required under Part III.B can be submitted to FWS via e-mail nmesfo@fws.gov and joel_lusk@fws.gov, or by mail to the New Mexico Ecological Services field office, 2105 Osuna Road NE, Albuquerque, New Mexico 87113. (Only Applicable to the COA and AMAFCA)

- b. Sediment Pollutant Load Reduction Strategy (Applicable to all permittees): The permittee must develop, implement, and evaluate a sediment pollutant load reduction strategy to assess and reduce pollutant loads associated with sediment (e.g., metals, etc. adsorbed to or traveling with sediment, as opposed to clean sediment) into the receiving waters of the Rio Grande. The strategy must include the following elements:
- (i) Sediment Assessment: The permittee must identify and investigate areas within its jurisdiction that may be contributing excessive levels (e.g., levels that may contribute to exceedance of applicable Water Quality Standards) of pollutants in sediments to the receiving waters of the Rio Grande as a result of stormwater discharges. The permittee must identify structural elements, natural or man-made topographical and geographical formations, MS4 operations activities, and areas indicated as potential sources of sediments pollutants in the receiving waters of the Rio Grande. At the time of assessment, the permittee shall record any observed erosion of soil or sediment along ephemeral channels, arroyos, or stream banks, noting the scouring or sedimentation in streams. The assessment should be made using available data from federal, state, or local studies supplemented as necessary with collection of additional data. The permittee must describe, in the first annual report, all standard operating procedures, quality assurance plans to assure that accurate data are collected, summarized, evaluated and reported.
 - (ii) Estimate Baseline Loading: Based on the results of the sediment pollutants assessment required in Part I.C.3.b.(i) above the permittee must provide estimates of baseline total sediment loading and relative potential for contamination of those sediments by urban activities for drainage areas, sub-watersheds, Impervious Areas (IAs), and/or Directly Connected Impervious Area (DCIAs) draining directly to a surface waterbody or other feature used to convey waters of the United States. Sediment loads may be provided for targeted areas in the entire Middle Rio Grande Watershed (see Appendix A) using an individual or cooperative approach. Any data available and/or preliminary numeric modeling results may be used in estimating loads.
 - (iii) Targeted Controls: Include a detailed description of all proposed targeted controls and BMPs that will be implemented to reduce sediment pollutant loads calculated in Part I.C.3.b.(ii) above during the next ten (10) years of permit issuance. For each targeted control, the permittee must include interim measurable goals (e.g., interim sediment pollutant load reductions) and an implementation and maintenance schedule, including interim milestones, for each control measure, and as appropriate, the months and years in which the MS4 will undertake the required actions. Any data available and/or preliminary numeric modeling results may be used in establishing the targeted controls, BMPs, and interim measurable goals. The permittee must prioritize pollutant load reduction efforts and target areas (e.g. drainage areas, sub-watersheds, IAs, DCIAs) that generate the highest annual average pollutant loads.
 - (iv) Monitoring and Interim Reporting: The permittee shall monitor or assess progress in achieving interim measurable goals and determining the effectiveness of BMPs, and shall include documentation of this

monitoring or assessment in the SWMP and annual reports. In addition, the SWMP must include methods to be used. This program element may be coordinated with the monitoring required in Part III.A.

(v) Progress Evaluation and Reporting: The permittee must assess the overall success of the Sediment Pollutant Load Reduction Strategy and document both direct and indirect measurements of program effectiveness in a Progress Report to be submitted with the fifth Annual Report. Data must be analyzed, interpreted, and reported so that results can be applied to such purposes as documenting effectiveness of the BMPs and compliance with the ESA requirements specified in Part I.C.3.b. The Progress Report must include:

- (a) A list of species likely to be within the action area;
- (b) Type and number of structural BMPs installed;
- (c) Evaluation of pollutant source reduction efforts;
- (d) Any recommendation based on program evaluation;
- (e) Description of how the interim sediment load reduction goals established in Part I.C.3.b.(iii) were achieved; and
- (f) Future planning activities needed to achieve increase of sediment load reduction required in Part I.C.3.d.(ii).

(vi) Critical Habitat (Applicable to all permittees): Verify that the installation of stormwater BMPs will not occur in or adversely affect currently listed endangered or threatened species critical habitat by reviewing the activities and locations of stormwater BMP installation within the location of critical habitat of currently listed endangered or threatened species at the U.S. Fish and Wildlife service website <http://criticalhabitat.fws.gov/crithab/>.

D. STORMWATER MANAGEMENT PROGRAM (SWMP)

1. General Requirements. The permittee must develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from a MS4 to the maximum extent practicable (MEP), to protect water quality (including that of downstream state or tribal waters), and to satisfy applicable surface water quality standards. The permittees shall continue implementation of existing SWMPs, and where necessary modify or revise existing elements and/or develop new elements to comply with all discharges from the MS4 authorized in Part I.A. The updated SWMP shall satisfy all requirements of this permit, and be implemented in accordance with Section 402(p)(3)(B) of the Clean Water Act (Act), and the Stormwater Regulations (40 CFR §122.26 and §122.34). This permit does not extend any compliance deadlines set forth in the previous permits (NMS000101 with effective date March 1, 2012 and permits No: NM NMR040000 and NMR040001 with effective date July 1, 2007).

If a permittee is already in compliance with one or more requirements in this section because it is already subject to and complying with a related local, state, or federal requirement that is at least as stringent as this permit's requirement, the permittee may reference the relevant requirement as part of the SWMP and document why this permit's requirement has been satisfied. Where this permit has additional conditions that apply, above and beyond what is required by the related local, state, or federal requirement, the permittee is still responsible for complying with these additional conditions in this permit.

2. Legal Authority. Each permittee shall implement the legal authority granted by the State or Tribal Government to control discharges to and from those portions of the MS4 over which it has jurisdiction. The difference in each co-permittee's jurisdiction and legal authorities, especially with respect to third parties, may be taken into account in developing the scope of program elements and necessary agreements (i.e. Joint Powers Agreement, Memorandum of Agreement, Memorandum of Understanding, etc.). Permittees may use a combination of statute, ordinance, permit, contract, order, interagency or inter-jurisdictional agreement(s) with other permittees to:

- a. Control the contribution of pollutants to the MS4 by stormwater discharges associated with industrial activity and the quality of stormwater discharged from sites of industrial activity (applicable only to MS4s located within the corporate boundary of the COA);
- b. Control the discharge of stormwater and pollutants associated with land disturbance and development activities, both during the construction phase and after site stabilization has been achieved (post-construction), consistent with Part I.D.5.a and Part I.D.5.b;
- c. Prohibit illicit discharges and sanitary sewer overflows to the MS4 and require removal of such discharges consistent with Part I.D.5.e;
- d. Control the discharge of spills and prohibit the dumping or disposal of materials other than stormwater (e.g. industrial and commercial wastes, trash, used motor vehicle fluids, leaf litter, grass clippings, animal wastes, etc.) into the MS4;
- e. Control, through interagency or inter-jurisdictional agreements among permittees, the contribution of pollutants from one (1) portion of the MS4 to another;
- f. Require compliance with conditions in ordinances, permits, contracts and/or orders; and
- g. Carry out all inspection, surveillance and monitoring procedures necessary to maintain compliance with permit conditions.

3. **Shared Responsibility and Cooperative Programs.**

- a. The SWMP, in addition to any interagency or inter-jurisdictional agreement(s) among permittees, (e.g., the Joint Powers Agreement to be entered into by the permittees), shall clearly identify the roles and responsibilities of each permittee.
- b. Implementation of the SWMP may be achieved through participation with other permittees, public agencies, or private entities in cooperative efforts to satisfy the requirements of Part I.D in lieu of creating duplicate program elements for each individual permittee.
 - (i) Implementation of one or more of the control measures may be shared with another entity, or the entity may fully take over the measure. A permittee may rely on another entity only if:
 - (a) the other entity, in fact, implements the control measure;
 - (b) the control measure, or component of that measure, is at least as stringent as the corresponding permit requirement; or,
 - (c) the other entity agrees to implement the control measure on the permittee's behalf. Written acceptance of this obligation is expected. The permittee must maintain this obligation as part of the SWMP description. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements in Part III.D of this permit. The permittee remains responsible for compliance with the permit obligations if the other entity fails to implement the control measure component.
- c. Each permittee shall provide adequate finance, staff, equipment, and support capabilities to fully implement its SWMP and all requirements of this permit.

4. **Measurable Goals.** The permittees shall control the discharge of pollutants from its MS4. The permittee shall implement the provisions set forth in Part I.D.5 below, and shall at a minimum incorporate into the SWMP the control measures listed in Part I.D.5 below. The SWMP shall include measurable goals, including interim milestones, for each control measure, and as appropriate, the months and years in which the MS4 will undertake the required actions and the frequency of the action.

5. Control Measures.

a. Construction Site Stormwater Runoff Control.

- (i) The permittee shall develop, revise, implement, and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. **Permittees previously covered under permit NMS000101 or NMR040000 must continue existing programs, updating as necessary, to comply with the requirements of this permit.** (Note: Highway Departments and Flood Control Authorities may only apply the construction site stormwater management program to the permittees's own construction projects)
- (ii) The program must include the development, implementation, and enforcement of, at a minimum:
 - (a) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal or local law;
 - (b) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices (both structural and non-structural);
 - (c) Requirements for construction site operators to control waste such as, but not limited to, discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality (see EPA guidance at <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=117>);
 - (d) Procedures for site plan review which incorporate consideration of potential water quality impacts. The site plan review must be conducted prior to commencement of construction activities, and include a review of the site design, the planned operations at the construction site, the planned control measures during the construction phase (including the technical criteria for selection of the control measures), and the planned controls to be used to manage runoff created after the development;
 - (e) Procedures for receipt and consideration of information submitted by the public;
 - (f) Procedures for site inspection (during construction) and enforcement of control measures, including provisions to ensure proper construction, operation, maintenance, and repair. The procedures must clearly define who is responsible for site inspections; who has the authority to implement enforcement procedures; and the steps utilized to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and the quality of the receiving water. If a construction site operator fails to comply with procedures or policies established by the permittee, the permittee may request EPA enforcement assistance. The site inspection and enforcement procedures must describe sanctions and enforcement mechanism(s) for violations of permit requirements and penalties with detail regarding corrective action follow-up procedures, including enforcement escalation procedures for recalcitrant or repeat offenders. Possible sanctions include non-monetary penalties (such as stop work orders and/or permit denials for non-compliance), as well as monetary penalties such as fines and bonding requirements;
 - (g) Procedures to educate and train permittee personnel involved in the planning, review, permitting, and/or approval of construction site plans, inspections and enforcement. Education and training shall also be provided for developers, construction site operators, contractors and supporting personnel, including requiring a stormwater pollution prevention plan for construction sites within the permittee's jurisdiction;
 - (h) Procedures for keeping records of and tracking all regulated construction activities within the MS4, i.e. site reviews, inspections, inspection reports, warning letters and other enforcement documents. A

summary of the number and frequency of site reviews, inspections (including inspector's checklist for oversight of sediment and erosion controls and proper disposal of construction wastes) and enforcement activities that are conducted annually and cumulatively during the permit term shall be included in each annual report; and

- (iii) Annually conduct site inspections of 100 percent of all construction projects cumulatively disturbing one (1) or more acres within the MS4 jurisdiction. Site inspections are to be followed by any necessary compliance or enforcement action. Follow-up inspections are to be conducted to ensure corrective maintenance has occurred; and, all projects must be inspected at completion for confirmation of final stabilization.
- (iv) The permittee must coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area to ensure that the construction stormwater runoff controls eliminate erosion and maintain sediment on site. Planning documents include, but are not limited to: comprehensive or master plans, subdivision ordinances, general land use plan, zoning code, transportation master plan, specific area plans, such as sector plan, site area plans, corridor plans, or unified development ordinances.
- (v) The site plan review required in Part I.D.5.a.(ii)(d) must include an evaluation of opportunities for use of GI/LID/Sustainable practices and when the opportunity exists, encourage project proponents to incorporate such practices into the site design to mimic the pre-development hydrology of the previously undeveloped site. For purposes of this permit, pre-development hydrology shall be met according to Part I.D.5.b of this permit. (consistent with any limitations on that capture). Include a reporting requirement of the number of plans that had opportunities to implement these practices and how many incorporated these practices.
- (vi) The permittee must include in the SWMP a description of the mechanism(s) that will be utilized to comply with each of the elements required in Part I.D.5.a.(i) throughout Part I.D.5.a.(v), including description of each individual BMP (both structural or non-structural) or source control measures and its corresponding measurable goal.
- (vii) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report. The permittee must include in each annual report:
 - (a) A summary of the frequency of site reviews, inspections and enforcement activities that are conducted annually and cumulatively during the permit term.
 - (b) The number of plans that had the opportunity to implement GI/LID/Sustainable practices and how many incorporated the practices.

Program Flexibility Elements

- (viii) The permittee may use storm water educational materials locally developed or provided by the EPA (refer to <http://water.epa.gov/polwaste/npdes/swbmp/index.cfm>, <http://www.epa.gov/smartgrowth/parking.htm>, <http://www.epa.gov/smartgrowth/stormwater.htm>), the NMED, environmental, public interest or trade organizations, and/or other MS4s.
- (ix) The permittee may develop or update existing construction handbooks (e.g., the COA NPDES Stormwater Management Guidelines for Construction and Industrial Activities Handbook) to be consistent with promulgated construction and development effluent limitation guidelines.
- (x) The construction site inspections required in Part I.D.5.a.(iii) may be carried out in conjunction with the permittee's building code inspections using a screening prioritization process.

Table 2. Construction Site Stormwater Runoff Control - Program Development and Implementation Schedules

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Development of an ordinance or other regulatory mechanism as required in Part I.D.5.a.(ii)(a)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of the permit
Develop requirements and procedures as required in Part I.D.5.a.(ii)(b) through in Part I.D.5.a.(ii)(h)	Ten (10) months from effective date of permit	Thirteen (13) months from effective date of permit	Sixteen (16) months from effective date of permit	Sixteen (16) months from effective date of permit	Eighteen (18) months from effective date of permit
Annually conduct site inspections of 100 percent of all construction projects cumulatively disturbing one (1) or more acres as required in Part I.D.5.a.(iii)	Ten (10) months from effective date of permit	Start Thirteen (13) months from effective date of permit and annually thereafter	Start Sixteen (16) months from effective date of permit and annually thereafter	Start eighteen (18) months from effective date of permit and thereafter	Start two (2) years from effective date of permit and thereafter
Coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area as required in Part I.D.5.a.(iv)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Twelve (12) months from effective date of permit	Twelve (12) months from effective date of permit	Fourteen (14) months from effective date of permit
Evaluation of GI/LID/Sustainable practices in site plan reviews as required in Part I.D.5.a.(v)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Twelve (12) months from effective date of permit	Twelve (12) months from effective date of permit	Fourteen (14) months from effective date of permit
Update the SWMP document and annual report as required in Part I.D.5.a.(vi) and in Part I.D.5.a.(vii)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary
Enhance the program to include program elements in Part I.D.5.a.(viii) through Part I.D.5.a.(x)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.
(**) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

b. Post-Construction Stormwater Management in New Development and Redevelopment

(i) The permittee must develop, revise, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. The program must ensure that controls are in place that would prevent or minimize water quality impacts. **Permittees previously covered under NMS000101 or NMR040000 must continue existing programs, updating as necessary, to comply with the requirements of this permit.** (Note: Highway Departments and Flood Control Authorities may only apply the post-construction stormwater management program to the permittee's own construction projects)

(ii) The program must include the development, implementation, and enforcement of, at a minimum:

(a) Strategies which include a combination of structural and/or non-structural best management practices (BMPs) to control pollutants in stormwater runoff.

(b) An ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law. The ordinance or policy must:

Incorporate a stormwater quality design standard that manages on-site the 90th percentile storm event discharge volume associated with new development sites and 80th percentile storm event discharge volume associated with redevelopment sites, through stormwater controls that infiltrate, evapotranspire the discharge volume, except in instances where full compliance cannot be achieved, as provided in Part I.D.5.b.(v). The stormwater from rooftop discharge may be harvested and used on-site for non-commercial use. Any controls utilizing impoundments that are also used for flood control that are located in areas where the New Mexico Office of the State Engineer requirements at NMAC 19.26.2.15 (see also Section 72-5-32 NMSA) apply must drain within 96 hours unless the state engineer has issued a waiver to the owner of the impoundment.

Options to implement the site design standard include, but not limited to: management of the discharge volume achieved by canopy interception, soil amendments, rainfall harvesting, rain tanks and cisterns, engineered infiltration, extended filtration, dry swales, bioretention, roof top disconnections, permeable pavement, porous concrete, permeable pavers, reforestation, grass channels, green roofs and other appropriate techniques, and any combination of these practices, including implementation of other stormwater controls used to reduce pollutants in stormwater (e.g., a water quality facility).

Estimation of the 90th or 80th percentile storm event discharge volume is included in EPA Technical Report entitled "*Estimating Predevelopment Hydrology in the Middle Rio Grande Watershed, New Mexico*, EPA Publication Number 832-R-14-007". Permittees can also estimate:

Option A: a site specific 90th or 80th percentile storm event discharge volume using methodology specified in the referenced EPA Technical Report.

Option B: a site specific pre-development hydrology and associated storm event discharge volume using methodology specified in the referenced EPA technical Report.

(c) The permittee must ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with preconstruction BMP design; failure to construct BMPs

in accordance with the agreed upon pre-construction design; and ineffective post-construction operation and maintenance of BMPs;

- (d) The permittee must ensure that the post-construction program requirements are constantly reviewed and revised as appropriate to incorporate improvements in control techniques;
 - (e) Procedure to develop and implement an educational program for project developers regarding designs to control water quality effects from stormwater, and a training program for plan review staff regarding stormwater standards, site design techniques and controls, including training regarding GI/LID/Sustainability practices. Training may be developed independently or obtained from outside resources, i.e. federal, state, or local experts;
 - (f) Procedures for site inspection and enforcement to ensure proper long-term operation, maintenance, and repair of stormwater management practices that are put into place as part of construction projects/activities. Procedure(s) shall include the requirement that as-built plans be submitted within ninety (90) days of completion of construction projects/activities that include controls designed to manage the stormwater associated with the completed site (post-construction stormwater management). Procedure(s) may include the use of dedicated funds or escrow accounts for development projects or the adoption by the permittee of all privately owned control measures. This may also include the development of maintenance contracts between the owner of the control measure and the permittee. The maintenance contract shall include verification of maintenance practices by the owner, allows the MS4 owner/operator to inspect the maintenance practices, and perform maintenance if inspections indicate neglect by the owner;
 - (g) Procedures to control the discharge of pollutants related to commercial application and distribution of pesticides, herbicides, and fertilizers where permittee(s) hold jurisdiction over lands not directly owned by that entity (e.g., incorporated city). The procedures must ensure that herbicides and pesticides applicators doing business within the permittee's jurisdiction have been properly trained and certified, are encouraged to use the least toxic products, and control use and application rates according to the applicable requirements; and
 - (h) Procedure or system to review and update, as necessary, the existing program to ensure that stormwater controls or management practices for new development and redevelopment projects/activities continue to meet the requirements and objectives of the permit.
- (iii) The permittee must coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private new development and redevelopment projects/activities within the permit area to ensure the hydrology associated with new development and redevelopment sites mimic to the extent practicable the pre-development hydrology of the previously undeveloped site, except in instances where the pre-development hydrology requirement conflicts with applicable water rights appropriation requirements. For purposes of this permit, pre-development hydrology shall be met by capturing the 90th percentile storm event runoff (consistent with any limitations on that capture) which under undeveloped natural conditions would be expected to infiltrate or evapotranspire on-site and result in little, if any, off-site runoff. (Note: This permit does not prevent permittees from requiring additional controls for flood control purposes.) Planning documents include, but are not limited to: comprehensive or master plans, subdivision ordinances, general land use plan, zoning code, transportation master plan, specific area plans, such as sector plan, site area plans, corridor plans, or unified development ordinances.
- (iv) The permittee must assess all existing codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices. The assessment shall include a list of the identified impediments, necessary regulation changes, and recommendations and proposed schedules to incorporate policies and standards to relevant documents and procedures to maximize infiltration, recharge, water harvesting, habitat improvement, and hydrological management of stormwater runoff as allowed under the applicable water rights appropriation requirements. The permittee must develop a report of the assessment findings, which is to be used to provide information to the permittee, of the regulation changes necessary to remove impediments and allow implementation of these practices.

- (v) Alternative Compliance for Infeasibility due to Site Constraints:
- (a) Infeasibility to manage the design standard volume specified in Part I(D)(5)(b)(ii)(b), or a portion of the design standard volume, onsite may result from site constraints including the following:
 - A. too small a lot outside of the building footprint to create the necessary infiltrative capacity even with amended soils;
 - B. soil instability as documented by a thorough geotechnical analysis;
 - C. a site use that is inconsistent with capture and reuse of storm water;
 - D. other physical conditions; or,
 - E. to comply with applicable requirements for on-site flood control structures leaves insufficient area to meet the standard.
 - (b) A determination that it is infeasible to manage the design standard volume specified in Part I.D.5.b.(ii)(b), or a portion of the design standard volume, on site may not be based solely on the difficulty or cost of implementing onsite control measures, but must include multiple criteria that rule out an adequate combination of the practices set forth in Part I.D.5.b.(v).
 - (c) This permit does not prevent imposition of more stringent requirements related to flood control. Where both the permittee's site design standard ordinance or policy and local flood control requirements on site cannot be met due to site conditions, the standard may be met through a combination of on-site and off-site controls.
 - (d) Where applicable New Mexico water law limits the ability to fully manage the design standard volume on site, measures to minimize increased discharge consistent with requirements under New Mexico water law must still be implemented.
 - (e) In instances where an alternative to compliance with the standard on site is chosen, technical justification as to the infeasibility of on-site management of the entire design standard volume, or a portion of the design standard volume, is required to be documented by submitting to the permittee a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect.
 - (f) When a Permittee determines a project applicant has demonstrated infeasibility due to site constraints specified in Part I.D.5.b.(v) to manage the design standard volume specified in Part I.D.5.b.(ii)(b) or a portion of the design standard volume on-site, the Permittee shall require one of the following mitigation options:
 - A. *Off-site mitigation.* The off-site mitigation option only applies to redevelopment sites and cannot be applied to new development. Management of the standard volume, or a portion of the volume, may be implemented at another location within the MS4 area, approved by the permittee. The permittee shall identify priority areas within the MS4 in which mitigation projects can be completed. The permittee shall determine who will be responsible for long-term maintenance on off-site mitigation projects.
 - B. *Ground Water Replenishment Project:* Implementation of a project that has been determined to provide an opportunity to replenish regional ground water supplies at an offsite location.
 - C. *Payment in lieu.* Payment in lieu may be made to the permittee, who will apply the funds to a public stormwater project. MS4s shall maintain a publicly accessible database of approved projects for which these payments may be used.

D. *Other.* In a situation where alternative options A through C above are not feasible and the permittee wants to establish another alternative option for projects, the permittee may submit to the EPA for approval, the alternative option that meets the standard.

- (vi) The permittee must estimate the number of acres of impervious area (IA) and directly connected impervious area (DCIA). For the purpose of this part, IA includes conventional pavements, sidewalks, driveways, roadways, parking lots, and rooftops. DCIA is the portion of IA with a direct hydraulic connection to the permittee's MS4 or a waterbody via continuous paved surfaces, gutters, pipes, and other impervious features. DCIA typically does not include isolated impervious areas with an indirect hydraulic connection to the MS4 (e.g., swale or detention basin) or that otherwise drain to a pervious area.
- (vii) The permittee must develop an inventory and priority ranking of MS4-owned property and infrastructure (including public right-of-way) that may have the potential to be retrofitted with control measures designed to control the frequency, volume, and peak intensity of stormwater discharges to and from its MS4. In determining the potential for retrofitting, the permittee shall consider factors such as the complexity and cost of implementation, public safety, access for maintenance purposes, subsurface geology, depth to water table, proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems, and opportunities for public use and education under the applicable water right requirements and restrictions. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service and control of discharges to impaired waters, streams, and critical receiving water (drinking water supply sources);
- (viii) The permittee must incorporate watershed protection elements into relevant policy and/or planning documents as they come up for regular review. If a relevant planning document is not scheduled for review during the term of this permit, the permittee must identify the elements that cannot be implemented until that document is revised, and provide to EPA and NMED a schedule for incorporation and implementation not to exceed five years from the effective date of this permit. As applicable to each permittee's MS4 jurisdiction, policy and/or planning documents must include the following:
 - (a) A description of master planning and project planning procedures to control the discharge of pollutants to and from the MS4.
 - (b) Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within each watershed, by controlling the unnecessary creation, extension and widening of impervious parking lots, roads and associated development. The permittee may evaluate the need to add impervious surface on a case-by-case basis and seek to identify alternatives that will meet the need without creating the impervious surface.
 - (c) Identify environmentally and ecologically sensitive areas that provide water quality benefits and serve critical watershed functions within the MS4 and ensure requirements to preserve, protect, create and/or restore these areas are developed and implemented during the plan and design phases of projects in these identified areas. These areas may include, but are not limited to critical watersheds, floodplains, and areas with endangered species concerns and historic properties. Stakeholders shall be consulted as appropriate.
 - (d) Implement stormwater management practices that minimize water quality impacts to streams, including disconnecting direct discharges to surface waters from impervious surfaces such as parking lots.
 - (e) Implement stormwater management practices that protect and enhance groundwater recharge as allowed under the applicable water rights laws.
 - (f) Seek to avoid or prevent hydromodification of streams and other water bodies caused by development, including roads, highways, and bridges.

- (g) Develop and implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils.
- (h) The program must be specifically tailored to address local community needs (e.g. protection to drinking water sources, reduction of water quality impacts) and must be designed to attempt to maintain pre-development runoff conditions.
- (ix) The permittee must update the SWMP as necessary to include a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.b.(i) throughout Part I.D.5.b.(viii) as well as the citations and descriptions of design standards for structural and non-structural controls to control pollutants in stormwater runoff, including discussion of the methodology used during design for estimating impacts to water quality and selecting structural and non-structural controls. Description of measurable goals for each BMP (structural or non-structural) or each stormwater control must be included in the SWMP.
- (x) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report. The following information must be included in each annual report:
 - (a) Include a summary and analysis of all maintenance, inspections and enforcement, and the number and frequency of inspections performed annually.
 - (b) A cumulative listing of the annual modifications made to the Post-Construction Stormwater Management Program during the permit term, and a cumulative listing of annual revisions to administrative procedures made or ordinances enacted during the permit term.
 - (c) According to the schedule presented in the Program Development and Implementation Schedule in Table 3, the permittee must
 - A. Report the number of MS4-owned properties and infrastructure that have been retrofitted with control measures designed to control the frequency, volume, and peak intensity of stormwater discharges. The permittee may also include in its annual report non-MS4 owned property that has been retrofitted with control measures designed to control the frequency, volume, and peak intensity of stormwater discharges.
 - B. As required in Part I.D.5.b.(vi), report the tabulated results for IA and DCIA and its estimation methodology. In each subsequent annual report, the permittee shall estimate the number of acres of IA and DCIA that have been added or removed during the prior year. The permittee shall include in its estimates the additions and reductions resulting from development, redevelopment, or retrofit projects undertaken directly by the permittee; or by private developers and other parties in a voluntary manner or in compliance with the permittee's regulations.

Program Flexibility Elements:

- (xi) The permittee may use storm water educational materials locally developed or provided by EPA (refer to <http://water.epa.gov/polwaste/npdes/swbmp/index.cfm>, <http://www.epa.gov/smartgrowth/parking.htm>, and <http://www.epa.gov/smartgrowth/stormwater.htm>); the NMED; environmental, public interest or trade organizations; and/or other MS4s.
- (xii) When choosing appropriate BMPs, the permittee may participate in locally-based watershed planning efforts, which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, the permittee may adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures.

- (xiii) The permittee may incorporate the following elements in the Post-Construction Stormwater Management in New Development and Redevelopment program required in Part I.D.5.b.(ii)(b):
- (a) Provide requirements and standards to direct growth to identified areas to protect environmentally and ecologically sensitive areas such as floodplains and/or other areas with endangered species and historic properties concerns;
 - (b) Include requirements to maintain and/or increase open space/buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; and
 - (c) Encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure.

Table 3. Post-Construction Stormwater Management in New Development and Redevelopment - Program Development and Implementation Schedules

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Development of strategies as required in Part I.D.5.b.(ii).(a)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Twelve (12) months from effective date of permit	Twelve (12) months from effective date of permit	Fourteen (14) months from effective date of permit
Development of an ordinance or other regulatory mechanism as required in Part I.D.5.b.(ii).(b)	Twenty (24) months from effective date of permit	Thirty (30) months from effective date of permit	Thirty six (36) months from effective date of permit	Thirty six (36) months from effective date of permit	Thirty six (36) months from effective date of permit
Implementation and enforcement, via the ordinance or other regulatory mechanism, of site design standards as required in Part I.D.5.b.(ii).(b)	Within thirty six (36) months from effective date of the permit	Within forty two (42) months from the effective date of the permit	Within forty eight (48) months from effective date of the permit	Within forty eight (48) months from effective date of the permit	Within forty eight (48) months from effective date of the permit
Ensure appropriate implementation of structural controls as required in Part I.D.5.b.(ii).(c) and Part I.D.5.b.(ii).(d)	Ten (10) months from effective date of permit	One (1) year from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Thirty (30) months from effective date of permit
Develop procedures as required in Part I.D.5.b.(ii).(e), Part I.D.5.b.(ii).(f), Part I.D.5.b.(ii).(g), and Part I.D.5.b.(ii).(h)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of permit

Coordinate internally with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private construction projects/activities within the permit area as required in Part I.D.5.b.(iii)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Eleven (11) months from effective date of permit	Eleven (11) months from effective date of permit	One (1) year from effective date of permit
As required in Part I.D.5.b.(iv), the permittee must assess all existing codes, ordinances, planning documents and other applicable regulations, for impediments to the use of GI/LID/Sustainable practices	Ten (10) months from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of permit	Eighteen (18) months from effective date of permit	Two (2) years from effective date of permit
As required in Part I.D.5.b.(iv), develop and submit a report of the assessment findings on GI/LID/Sustainable practices.	Eleven (11) months from effective date of permit	Eighteen (18) months from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Twenty seven (27) months from effective date of permit
Estimation of the number of acres of IA and DCIA as required in Part I.D.5.b.(vi)	Ten (10) months from effective date of permit	One (1) year from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Thirty (30) months from effective date of permit
Inventory and priority ranking as required in section in Part I.D.5.b.(vii)	Within fifteen (15) months from effective date of the permit	Within twenty four (24) months from effective date of the permit	Within thirty six (36) months from effective date of the permit	Within thirty six (36) months from effective date of the permit	Within forty two (42) months from effective date of the permit
Incorporate watershed protection elements as required in Part I.D.5.b.(viii)	Ten (10) months from effective date of permit	One (1) year from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Thirty (30) months from effective date of permit
Update the SWMP document and annual report as required in Part I.D.5.b.(ix) and Part I.D.5.b.(x).	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary
Enhance the program to include program elements in Part I.D.5.b.(xi) and Part I.D.5.b.(xii)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.

(**) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

c. Pollution Prevention/Good Housekeeping for Municipal/Co-permittee Operations.

- (i) The permittee must develop, revise and implement an operation and maintenance program that includes a training component and the ultimate goal of preventing or reducing pollutant runoff from municipal operations. **Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit.** The program must include:
- (a) Development and implementation of an employee training program to incorporate pollution prevention and good housekeeping techniques into everyday operations and maintenance activities. The employee training program must be designed to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. The permittee must also develop a tracking procedure and ensure that employee turnover is considered when determining frequency of training;
 - (b) Maintenance activities, maintenance schedules, and long term inspections procedures for structural and non-structural storm water controls to reduce floatable, trash, and other pollutants discharged from the MS4.
 - (c) Controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations, snow disposal areas operated by the permittee, and waste transfer stations;
 - (d) Procedures for properly disposing of waste removed from the separate storm sewers and areas listed in Part I.D.5.c.(i).(c) (such as dredge spoil, accumulated sediments, floatables, and other debris); and
 - (e) Procedures to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices.

Note: The permittee may use training materials that are available from EPA, NMED, Tribe, or other organizations.

- (ii) The Pollution Prevention/Good Housekeeping program must include the following elements:
- (a) Develop or update the existing list of all stormwater quality facilities by drainage basin, including location and description;
 - (b) Develop or modify existing operational manual for de-icing activities addressing alternate materials and methods to control impacts to stormwater quality;
 - (c) Develop or modify existing program to control pollution in stormwater runoff from equipment and vehicle maintenance yards and maintenance center operations located within the MS4;
 - (d) Develop or modify existing street sweeping program. Assess possible benefits from changing frequency or timing of sweeping activities or utilizing different equipment for sweeping activities;
 - (e) A description of procedures used by permittees to target roadway areas most likely to contribute pollutants to and from the MS4 (i.e., runoff discharges directly to sensitive receiving water, roadway receives majority of de-icing material, roadway receives excess litter, roadway receives greater loads of oil and grease);
 - (f) Develop or revise existing standard operating procedures for collection of used motor vehicle fluids (at a minimum oil and antifreeze) and toxics (including paint, solvents, fertilizers, pesticides, herbicides,

- and other hazardous materials) used in permittee operations or discarded in the MS4, for recycle, reuse, or proper disposal;
- (g) Develop or revised existing standard operating procedures for the disposal of accumulated sediments, floatables, and other debris collected from the MS4 and during permittee operations to ensure proper disposal;
 - (h) Develop or revised existing litter source control programs to include public awareness campaigns targeting the permittee audience; and
 - (i) Develop or review and revise, as necessary, the criteria, procedures and schedule to evaluate existing flood control devices, structures and drainage ways to assess the potential of retrofitting to provide additional pollutant removal from stormwater. Implement routine review to ensure new and/or innovative practices are implemented where applicable.
 - (j) Enhance inspection and maintenance programs by coordinating with maintenance personnel to ensure that a target number of structures per basin are inspected and maintained per quarter;
 - (k) Enhance the existing program to control the discharge of floatables and trash from the MS4 by implementing source control of floatables in industrial and commercial areas;
 - (l) Include in each annual report, a cumulative summary of retrofit evaluations conducted during the permit term on existing flood control devices, structures and drainage ways to benefit water quality. Update the SWMP to include a schedule (with priorities) for identified retrofit projects;
 - (m) Flood management projects: review and revise, as necessary, technical criteria guidance documents and program for the assessment of water quality impacts and incorporation of water quality controls into future flood control projects. The criteria guidance document must include the following elements:
 - A. Describe how new flood control projects are assessed for water quality impacts.
 - B. Provide citations and descriptions of design standards that ensure water quality controls are incorporated in future flood control projects.
 - C. Include method for permittees to update standards with new and/or innovative practices.
 - D. Describe master planning and project planning procedures and design review procedures.
 - (n) Develop procedures to control the discharge of pollutants related to the storage and application of pesticides, herbicides, and fertilizers applied, by the permittee's employees or contractors, to public right-of-ways, parks, and other municipal property. The permittee must provide an updated description of the data monitoring system for all permittee departments utilizing pesticides, herbicides and fertilizers.
- (iii) Comply with the requirements included in the EPA Multi Sector General Permit (MSGP) to control runoff from industrial facilities (as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi)) owned or operated by the permittees and ultimately discharge to the MS4. The permittees must develop or update:
- (a) A list of municipal/permittee operations impacted by this program,
 - (b) A map showing the industrial facilities owned and operated by the MS4,
 - (c) A list of the industrial facilities (other than large construction activities defined as industrial activity) that will be included in the industrial runoff control program by category and by basin. The list must include the permit authorization number or a MSGP NOI ID for each facility as applicable.

- (iv) The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.c.(i) throughout Part I.D.5.c.(iii) and its corresponding measurable goal.
- (v) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report.

Table 4. Pollution Prevention/Good Housekeeping for Municipal/Co-permittee Operations - Program Development and Implementation Schedules

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
-Develop or update the Pollution Prevention/Good House Keeping program to include the elements in Part I.D.5.c.(i)	Ten (10) months from effective date of the permit	Twelve (12) months from effective date of the permit	Fourteen (14) months from effective date of the permit	Fourteen (14) months from effective date of the permit	Eighteen (18) months from effective date of the permit
-Enhance the program to include the elements in Part I.D.5.c.(ii)	Ten (10) months from effective date of the permit	One (1) year from effective date of the permit	Two (2) years from effective date of the permit	Two (2) years from effective date of the permit	Thirty (30) months from effective date of the permit
-Develop or update a list and a map of industrial facilities owned or operated by the permittee as required in Part I.D.5.c.(iii)	Ten (10) months from effective date of the permit	Eleven (11) months from effective date of the permit	One (1) year from effective date of the permit	One (1) year from effective date of the permit	Eighteen (18) months from effective date of the permit
Update the SWMP document and annual report as required in Part I.D.5.c.(iv) and Part I.D.5.c.(v)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs (**)

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

d. Industrial and High Risk Runoff (Applicable only to Class A permittees)

- (i) The permittee must control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi). If no such industrial activities are in a permittees jurisdiction, that permittee may certify that this program element does not apply.
- (ii) The permittee must continue implementation and enforcement of the Industrial and High Risk Runoff program, assess the overall success of the program, and document both direct and indirect measurements of program effectiveness in the annual report. The program shall include:
 - (a) A description of a program to identify, monitor, and control pollutants in stormwater discharges to the MS4 from municipal landfills; other treatment, storage, or disposal facilities for municipal waste (e.g. transfer stations, incinerators, etc.); hazardous waste treatment, storage, disposal and recovery facilities; facilities that are subject to EPCRA Title III, Section 313; and any other industrial or commercial discharge the permittee(s) determines are contributing a substantial pollutant loading to the

MS4. (Note: If no such facilities are in a permittees jurisdiction, that permittee may certify that this program element does not apply.); and

- (b) Priorities and procedures for inspections and establishing and implementing control measures for such discharges.
- (iii) Permittees must comply with the monitoring requirements specified in Part III.A.4;
- (iv) The permittee must modify the following as necessary:
 - (a) The list of the facilities included in the program, by category and basin;
 - (b) Schedules and frequency of inspection for listed facilities. Facility inspections may be carried out in conjunction with other municipal programs (e.g. pretreatment inspections of industrial users, health inspections, fire inspections, etc.), but must include random inspections for facilities not normally visited by the municipality;
 - (c) The priorities for inspections and procedures used during inspections (e.g. inspection checklist, review for NPDES permit coverage; review of stormwater pollution prevention plan; etc.); and
 - (d) Monitoring frequency, parameters and entity performing monitoring and analyses (MS4 permittees or subject facility). The monitoring program may include a waiver of monitoring for parameters at individual facilities based on a "no-exposure" certification;
- (v) The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.d.(i) throughout Part I.D.5.d.(iv) and its corresponding measurable goal.
- (vi) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report.

Program Flexibility Elements:

- (vii) The permittee may:
 - (a) Use analytical monitoring data, on a parameter-by-parameter basis, that a facility has collected to comply with or apply for a State or NPDES discharge permit (other than this permit), so as to avoid unnecessary cost and duplication of effort;
 - (b) Allow the facility to test only one (1) outfall and to report that the quantitative data also apply to the substantially identical outfalls if:
 - A. A Type 1 or Type 2 industrial facility has two (2) or more outfalls with substantially identical effluents, and
 - B. Demonstration by the facility that the stormwater outfalls are substantially identical, using one (1) or all of the following methods for such demonstration. The NPDES Stormwater Sampling Guidance Document (EPA 833-B-92-001), available on EPA's website at [provides detailed guidance on each of the three options: \(1\) submission of a narrative description and a site map; \(2\) submission of matrices; or \(3\) submission of model matrices.](#)
 - (c) Accept a copy of a "no exposure" certification from a facility made to EPA under 40 CFR §122.26(g), in lieu of analytic monitoring.

Table 5: Industrial and High Risk Runoff - Program Development and Implementation Schedules:

Activity	Permittee Class	
	A Phase I MS4s	Cooperative (*) Any Permittee with cooperative programs
Ordinance (or other control method) as required in Part I.D.5.d.(i)	Ten (10) months from effective date of the permit	Twelve (12) months from effective date of the permit
Continue implementation and enforcement of the Industrial and High Risk Runoff program, assess the overall success of the program, and document both direct and indirect measurements of program effectiveness in the annual report as required in Part I.D.5.d.(ii)	Ten (10) months from effective date of the permit	Twelve (12) months from effective date of the permit
Meet the monitoring requirements in Part I.D.5.d.(iii)	Ten (10) months from effective date of the permit	Twelve (12) months from effective date of the permit
Include requirements in Part I.D.5.d.(iv)	Ten (10) months from permit effective date of the permit	Twelve (12) months from effective date of the permit
Update the SWMP document and annual report as required in Part I.D.5.d.(v) and Part I.D.5.d.(vi)	Update as necessary	Update as necessary
Enhance the program to include requirements in Part I.D.5.d.(vii)	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.
Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

e. Illicit Discharges and Improper Disposal

(i) The permittee shall develop, revise, implement, and enforce a program to detect and eliminate illicit discharges (as defined at 40 CFR 122.26(b)(2)) entering the MS4. **Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit.** The permittee must:

- (a) Develop, if not already completed, a storm sewer system map, showing the names and locations of all outfalls as well as the names and locations of all waters of the United States that receive discharges from those outfalls. Identify all discharges points into major drainage channels draining more than twenty (20) percent of the MS4 area;
- (b) To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into the MS4, and implement appropriate enforcement procedures and actions;
- (c) Develop and implement a plan to detect and address non-stormwater discharges, including illegal dumping, to the MS4. The permittee must include the following elements in the plan:
 - A. Procedures for locating priority areas likely to have illicit discharges including field test for selected pollutant indicators (ammonia, boron, chlorine, color, conductivity, detergents, *E. coli*, enterococci, total coliform, fluoride, hardness, pH, potassium, conductivity, surfactants), and visually screening outfalls during dry weather;

- B. Procedures for enforcement, including enforcement escalation procedures for recalcitrant or repeat offenders;
 - C. Procedures for removing the source of the discharge;
 - D. Procedures for program evaluation and assessment; and
 - E. Procedures for coordination with adjacent municipalities and/or state, tribal, or federal regulatory agencies to address situations where investigations indicate the illicit discharge originates outside the MS4 jurisdiction.
- (d) Develop an education program to promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials. The permittee shall inform public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste.
 - (e) Establish a hotline to address complaints from the public.
 - (f) Investigate suspected significant/severe illicit discharges within forty-eight (48) hours of detection and all other discharges as soon as practicable; elimination of such discharges as expeditiously as possible; and, requirement of immediate cessation of illicit discharges upon confirmation of responsible parties.
 - (g) Review complaint records for the last permit term and develop a targeted source reduction program for those illicit discharge/improper disposal incidents that have occurred more than twice in two (2) or more years from different locations. (Applicable only to class A and B permittees)
 - (h) If applicable, implement the program using the priority ranking develop during last permit term
- (ii) The permittee shall address the following categories of non-stormwater discharges or flows (e.g., illicit discharges) only if they are identified as significant contributors of pollutants to the MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(90)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water.

Note: Discharges or flows from fire fighting activities are excluded from the effective prohibitions against non-stormwater and need only be addressed where they are identified a significant sources of pollutants to water of the United States).
- (iii) The permittee must screen the entire jurisdiction at least once every five (5) years and high priority areas at least once every year. High priority areas include any area where there is ongoing evidence of illicit discharges or dumping, or where there are citizen complaints on more than five (5) separate events within twelve (12) months. The permittee must:
 - (a) Include in its SWMP document a description of the means, methods, quality assurance and controls protocols, and schedule for successfully implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis evaluation of data collected.
 - (b) Comply with the dry weather screening program established in Table 6 and the monitoring requirements specified in Part III.A.2.
 - (c) If applicable, implement the priority ranking system develop in previous permit term.

- (iv) **Waste Collection Programs:** The permittee must develop, update, and implement programs to collect used motor vehicle fluids (at a minimum, oil and antifreeze) for recycle, reuse, or proper disposal, and to collect household hazardous waste materials (including paint, solvents, fertilizers, pesticides, herbicides, and other hazardous materials) for recycle, reuse, or proper disposal. Where available, collection programs operated by third parties may be a component of the programs. Permittees shall enhance these programs by establishing the following elements as a goal in the SWMP:
- A. Increasing the frequency of the collection days hosted;
 - B. Expanding the program to include commercial fats, oils and greases; and
 - C. Coordinating program efforts between applicable permittee departments.
- (v) **Spill Prevention and Response.** The permittee must develop, update and implement a program to prevent, contain, and respond to spills that may discharge into the MS4. The permittees must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit. The Spill Prevention and Response program shall include:
- (a) Where discharge of material resulting from a spill is necessary to prevent loss of life, personal injury, or severe property damage, the permittee(s) shall take, or insure the party responsible for the spill takes, all reasonable steps to control or prevent any adverse effects to human health or the environment: and
 - (b) The spill response program may include a combination of spill response actions by the permittee (and/or another public or private entity), and legal requirements for private entities within the permittee's municipal jurisdiction.
- (vi) The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.e.(i) throughout Part I.D.5.e.(v) and its corresponding measurable goal. A description of the means, methods, quality assurance and controls protocols, and schedule for successfully implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis evaluation of data collected
- (vii) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report.
- (viii) The permittee must expeditiously revise as necessary, within nine (9) months from the effective date of the permit, the existing permitting/certification program to ensure that any entity applying for the use of Right of Way implements controls in their construction and maintenance procedures to control pollutants entering the MS4. (Only applicable to NMDOT)

Program Flexibility Elements

- (ix) The permittee may:
- (a) Divide the jurisdiction into assessment areas where monitoring at fewer locations would still provide sufficient information to determine the presence or absence of illicit discharges within the larger area;
 - (b) Downgrade high priority areas after the area has been screened at least once and there are citizen complaints on no more than five (5) separate events within a twelve (12) month period;
 - (c) Rely on a cooperative program with other MS4s for detection and elimination of illicit discharges and illegal dumping;

- (d) If participating in a cooperative program with other MS4s, required detection program frequencies may be based on the combined jurisdictional area rather than individual jurisdictional areas and may use assessment areas crossing jurisdictional boundaries to reduce total number of screening locations (e.g., a shared single screening location that would provide information on more than one jurisdiction); and
- (e) After screening a non-high priority area once, adopt an “in response to complaints only” IDDE for that area provided there are citizen complaints on no more than two (2) separate events within a twelve (12) month period.
- (f) Enhance the program to utilize procedures and methodologies consistent with those described in “Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments.”

Table 6. Illicit Discharges and Improper Disposal - Program Development and Implementation Schedules

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census ***)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Mapping as required in Part I.D.5.e.(i)(a)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Eleven (11) months from effective date of permit	Eleven (11) months from effective date of permit	Fourteen (14) months from effective date of permit
Ordinance (or other control method) as required in Part I.D.5.e.(i)(b)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Thirty (30) months from effective date of permit
Develop and implement a IDDE plan as required in Part I.D.5.e.(i)(c)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Thirty (30) months from effective date of permit
Develop an education program as required in Part I.D.5.e.(i)(d)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of permit
Establish a hotline as required in Part I.D.5.e.(i)(e)	Update as necessary	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of permit
Investigate suspected significant/severe illicit discharges as required in Part I.D.5.e.(i)(f)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of permit
Review complaint records and develop a targeted source reduction program as required in Part I.D.5.e.(i)(g)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	N/A	N/A	One (1) year from effective date of permit

Screening of system as required in Part I.D.5.e.(iii) as follows:	1 / year	1 / year	1 / year	1 / year	1 / year
a.) High priority areas**					
b.) Whole system	-Screen 20% of the MS4 per year	- Screen 20% of the MS4 per year	-Years 1 – 2: develop procedures as required in Part I.D.5.e.(i)(c) -Year 3: screen 30% of the MS4 -Year 4: screen 20% of the MS4 -Year 5: screen 50% of the MS4	-Years 1 – 2: develop procedures as required Part I.D.5.e.(i)(c) -Year 3: screen 30% of the MS4 -Year 4: screen 20% of the MS4 -Year 5: screen 50% of the MS4	-Years 1 – 3: develop procedures as require in Part I.D.5.e.(i)(c) -Year 4: screen 30% of the MS4 -Year 5: screen 70% of the MS4
Develop, update, and implement a Waste Collection Program as required in Part I.D.5.e.(iv)	Ten (10) months from effective date of permit	Eighteen (18) months from effective date of permit	Two (2) years from effective date of permit	Two (2) years from effective date of permit	Thirty (30) months from effective date of permit
Develop, update and implement a Spill Prevention and Response program to prevent, contain, and respond to spills that may discharge into the MS4 as required in Part I.D.5.e.(v)	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	One (1) year from effective date of permit	One (1) year from effective date of permit	Eighteen (18) months from effective date of permit
Update the SWMP document and annual report as required in Part I.D.5.e.(iii), Part I.D.5.e.(vi), and Part I.D.5.e.(vii).	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary
Enhance the program to include requirements in Part I.D.5.e.(ix)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.

(**) High priority areas include any area where there is ongoing evidence of illicit discharges or dumping, or where there are citizen complaints on more than five (5) separate events within twelve (12) months

(***) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

f. Control of Floatables Discharges

- (i) The permittee must develop, update, and implement a program to address and control floatables in discharges into the MS4. The floatables control program shall include source controls and, where necessary, structural controls. **Permittees previously covered under NMS000101 or NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit.** The following elements must be included in the program:

- (a) Develop a schedule for implementation of the program to control floatables in discharges into the MS4 (Note: AMAFCA and the City of Albuquerque should update the schedule according to the findings of the 2005 AMAFCA/COA Floatable and Gross Pollutant Study and other studies); and
 - (b) Estimate the annual volume of floatables and trash removed from each control facility and characterize the floatable type.
- (ii) The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.f.(i).
- (iii) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report.

Table 7. Control of Floatables Discharges - Program Development and Implementation Schedules

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
- Develop a schedule to implement the program as required in Part I.D.5.f.(i)(a)	Ten (10) months from the effective date of the permit	Ten (10) months from the effective date of the permit	One (1) year from the effective date of the permit	One (1) year from the effective date of the permit	Eighteen (18) months from the effective date of the permit
-Estimate the annual volume of floatables and trash removed from each control facility and characterize the floatable type as required in Part I.D.5.f.(i)(b)	Ten (10) months from the effective date of the permit	One (1) year from the effective date of the permit	Two (2) years from the effective date of the permit	Two (2) years from the effective date of the permit	Thirty (30) months from the effective date of the permit
Update the SWMP document and annual report as required in Part I.D.5.f.(ii) and Part I.D.5.f.(iii).	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.

(**) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

g. Public Education and Outreach on Stormwater Impacts

- (i) The permittee shall, individually or cooperatively, develop, revise, implement, and maintain a comprehensive stormwater program to educate the community, employees, businesses, and the general public of hazards associated with the illegal discharges and improper disposal of waste and about the impact that stormwater discharges on local waterways, as well as the steps that the public can take to reduce pollutants in stormwater. **Permittees previously covered under NMS000101 and NMR040000 must continue existing programs while updating those programs, as necessary, to comply with the requirements of this permit.**
- (ii) The permittee must implement a public education program to distribute educational knowledge to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff. The permittee must:

- (a) Define the goals and objectives of the program based on high priority community-wide issues;
 - (b) Develop or utilize appropriate educational materials, such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, and websites;
 - (c) Inform individuals and households about ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes;
 - (d) Inform individuals and groups how to become involved in local stream and beach restoration activities as well as activities that are coordinated by youth service and conservation corps or other citizen groups;
 - (e) Use tailored public education program, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed cleanups; and
 - (f) Use materials or outreach programs directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts. For example, providing information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. The permittee may tailor the outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children. The permittee must make information available for non-English speaking residents, where appropriate.
- (iii) The permittee must include the following information in the Stormwater Management Program (SWMP) document:
- (a) A description of a program to promote, publicize, facilitate public reporting of the presence of illicit discharges or water quality associated with discharges from municipal separate storm sewers;
 - (b) A description of the education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials; and
 - (c) A description of the mechanism(s) utilized to comply with each of the elements required in Part I.D.5.g.(i) and Part I.D.5.g.(ii) and its corresponding measurable goal.
- (iv) The permittee must assess the overall success of the program, and document both direct and indirect measurements of program effectiveness in the Annual Report.

Program Flexibility Elements

- (v) Where necessary to comply with the Minimum Control Measures established in Part I.D.5.g.(i) and Part I.D.5.g.(ii), the permittee should develop a program or modify/revise an existing education and outreach program to:
 - (a) Promote, publicize, and facilitate the use of Green Infrastructure (GI)/Low Impact Development (LID)/Sustainability practices; and
 - (b) Include an integrated public education program (including all permittee departments and programs within the MS4) regarding litter reduction, reduction in pesticide/herbicide use, recycling and proper

disposal (including yard waste, hazardous waste materials, and used motor vehicle fluids), and GI/LID/Sustainable practices (including xeriscaping, reduced water consumption, water harvesting practices allowed by the New Mexico State Engineer Office).

- (vi) The permittee may collaborate or partner with other MS4 operators to maximize the program and cost effectiveness of the required outreach.
- (vii) The education and outreach program may use citizen hotlines as a low-cost strategy to engage the public in illicit discharge surveillance.
- (viii) The permittee may use stormwater educational materials provided by the State, Tribe, EPA, environmental, public interest or trade organizations, or other MS4s. The permittee may also integrate the education and outreach program with existing education and outreach programs in the Middle Rio Grande area. Example of existing programs include:
 - (a) Classroom education on stormwater;
 - A. Develop watershed map to help students visualize area impacted.
 - B. Develop pet-specific education
 - (b) Establish a water committee/advisor group;
 - (c) Contribute and participate in Stormwater Quality Team;
 - (d) Education/outreach for commercial activities;
 - (e) Hold regular employee trainings with industry groups
 - (f) Education of lawn and garden activities;
 - (g) Education on sustainable practices;
 - (h) Education/outreach of pet waste management;
 - (i) Education on the proper disposal of household hazardous waste;
 - (j) Education/outreach programs aimed at minority and disadvantaged communities and children;
 - (k) Education/outreach of trash management;
 - (l) Education/outreach in public events;
 - A. Participate in local events—brochures, posters, etc.
 - B. Participate in regional events (i.e., State Fair, Balloon Fiesta).
 - (m) Education/outreach using the media (e.g. publish local newsletters);
 - (n) Education/outreach on water conservation practices designed to reduce pollutants in storm water for home residences.

Table 8. Public Education and Outreach on Stormwater Impacts - Program_Development and Implementation Schedules

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Develop, revise, implement, and maintain an education and outreach program as required in Part I.D.5.g.(i) and Part I.D.5.g.(ii)	Ten (10) months from the effective date of the permit	Eleven (11) months from the effective date of the permit	Twelve (12) months from effective date of the permit	Twelve (12) months from effective date of the permit	Fourteen (14) months from effective date of the permit
Update the SWMP document and annual report as required in Part I.D.5.g.(iii) and Part I.D.5.g.(iv)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary
Enhance the program to include requirements in Part I.D.5.g.(v) through Part I.D.5.g.(viii)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.

(**) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

h. Public Involvement and Participation

- (i) The permittee must provide local public notice of and make available for public review a copy of the complete NOI and attachments (see Part I.B.2). Local public notice may be made by newspaper notice, notice at a council meeting, posting on the internet, or other method consistent with state/tribal/local public notice requirements.

The permittee must consider all public comments received during the public notice period and modify the NOI, or include a schedule to modify the SWMP, as necessary, or as required by the Director modify the NOI or/and SWMP in response to such comments. The Permittees must include in the NOI any unresolved public comments and the MS4's response to these comments. Responses provided by the MS4 will be considered as part of EPA's decision-making process. See also Appendix E Providing Comments or Requesting a Public Hearing on an Operator's NOI.

- (ii) The permittee shall develop, revise, implement and maintain a plan to encourage public involvement and provide opportunities for participation in the review, modification and implementation of the SWMP; develop and implement a process by which public comments to the plan are received and reviewed by the person(s) responsible for the SWMP; and, make the SWMP available to the public and to the operator of any MS4 or Tribal authority receiving discharges from the MS4. **Permittee previously covered under NMS000101 or NMR040000 must continue existing public involvement and participation programs while updating those programs, as necessary, to comply with the requirements of this permit.**

- (iii) The plan required in Part I.D.5.h.(ii) shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The permittee must include the following elements in the plan:
- (a) A detailed description of the general plan for informing the public of involvement and participation opportunities, including types of activities; target audiences; how interested parties may access the SWMP; and how the public was involved in development of the SWMP;
 - (b) The development and implementation of at least one (1) assessment of public behavioral change following a public education and/or participation event;
 - (c) A process to solicit involvement by environmental groups, environmental justice communities, civic organizations or other neighborhoods/organizations interested in water quality-related issues, including but not limited to the Middle Rio Grande Water Quality Work Group, the Middle Rio Grande Bosque Initiative, the Middle Rio Grande Endangered Species Act Collaborative Program, the Middle Rio Grande-Albuquerque Reach Watershed Group, the Pueblos of Santa Ana, Sandia and Isleta, Albuquerque Bernalillo County Water Utility Authority, UNM Colleges and Schools, and Chartered Student Organizations; and
 - (d) An evaluation of opportunities to utilize volunteers for stormwater pollution prevention activities and awareness throughout the area.
- (iv) The permittee shall comply with State, Tribal and local public notice requirements when implementing a public involvement/ participation program.
- (v) The public participation process must reach out to all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local stormwater management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts.
- (vi) The permittee must include in the SWMP a description of the mechanism(s) utilized to comply with each of the elements required in Parts I.D.5.h.(i) throughout Part I.D.5.h.(iv) and its corresponding measurable goal.
- (vii) The permittee shall assess the overall success of the program, and document the program effectiveness in the annual report.
- (viii) The permittee must provide public accessibility of the Storm Water Management Program (SWMP) document and Annual Reports online via the Internet and during normal business hours at the MS4 operator's main office, a local library, posting on the internet and/or other readily accessible location for public inspection and copying consistent with any applicable federal, state, tribal, or local open records requirements. Upon a showing of significant public interest, the MS4 operator is encouraged to hold a public meeting (or include in the agenda of in a regularly scheduled city council meeting, etc.) on the NOI, SWMP, and Annual Reports. (See Part III B)

Program Flexibility Elements

- (ix) The permittee may integrate the public Involvement and participation program with existing education and outreach programs in the Middle Rio Grande area. Example of existing programs include: Adopt-A-Stream Programs; Attitude Surveys; Community Hotlines (e.g. establishment of a "311"-type number and system established to handle storm-water-related concerns, setting up a public tracking/reporting

system, using phones and social media); Revegetation Programs; Storm Drain Stenciling Programs; Stream cleanup and Monitoring program/events.

Table 9. Public Involvement and Participation - *Program Development and Implementation Schedules*

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Develop (or update), implement, and maintain a public involvement and participation plan as required in Part I.D.5.h.(ii) and Part I.D.5.h.(iii)	Ten (10) months from effective date of the permit	Ten (10) months from effective date of the permit	Eleven (11) months from effective date of the permit	Eleven (11) months from effective date of the permit	One (1) year from effective date of the permit
Comply with State, Tribal, and local notice requirements when implementing a Public Involvement and Participation Program as required in Part I.D.5.h.(iv)	Ten (10) months from effective date of the permit	Eleven (11) months from effective date of the permit	Twelve (12) months from effective date of the permit	Twelve (12) months from effective date of the permit	Fourteen (14) months from effective date of the permit
Include elements as required in Part I.D.5.h.(v)	Ten (10) months from effective date of the permit	Eleven (11) months from effective date of the permit	One (1) year from effective date of the permit	One (1) year from effective date of the permit	Eighteen (18) months from effective date of the permit
Update the SWMP document and annual report as required in Part I.D.5.h.(vi), Part I.D.5.h.(vii), and Part I.D.5.h.(viii)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary
Enhance the program to include requirements in Part I.D.5.h.(ix)	Update as necessary	Update as necessary	Update as necessary	Update as necessary	Update as necessary

(*) During development of cooperative programs, the permittee must continue to implement existing programs.

(**) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

6. **Stormwater Management Program Review and Modification.**

- a. **Program Review.** Permittee shall participate in an annual review of its SWMP in conjunction with preparation of the annual report required in Part III.B. Results of the review shall be discussed in the annual report and shall include an assessment of:
 - (i) SWMP implementation, progress in achieving measurable goals, and compliance with program elements and other permit conditions;
 - (ii) the effectiveness of its SWMP, and any necessary modifications, in complying with the permit, including requirements to control the discharge of pollutants, and comply with water quality standards and any applicable approved TMDLs; and the adequacy of staff, funding levels, equipment, and support capabilities to fully implement the SWMP and comply with permit conditions.

- (a) Project staffing requirements, in man hours, for the implementation of the MS4 program during the upcoming year.
 - (b) Staff man hours used during the previous year for implementing the MS4 program. Man hours may be estimated based on staff assigned, assuming a forty (40) hour work week.
- b. Program Modification. The permittee(s) may modify its SWMP with prior notification or request to the EPA and NMED in accordance with this section.
 - (i) Modifications adding, but not eliminating, replacing, or jeopardizing fulfillment of any components, controls, or requirements of its SWMP may be made by the permittee(s) at any time upon written notification to the EPA.
 - (ii) Modifications replacing or eliminating an ineffective or unfeasible component, control or requirement of its SWMP, including monitoring and analysis requirements described in Parts III.A and V, may be requested in writing at any time. If request is denied, the EPA will send a written explanation of the decision. Modification requests shall include the following:
 - (a) a description of why the SWMP component is ineffective, unfeasible (including cost prohibitions), or unnecessary to support compliance with the permit;
 - (b) expectations on the effectiveness of the proposed replacement component; and
 - (c) an analysis of how the proposed replacement component is expected to achieve the goals of the component to be replaced.
 - (iii) Modifications resulting from schedules contained in Part VI may be requested following completion of an interim task or final deadline.
 - (iv) Modification requests or notifications shall be made in writing, signed in accordance with Part IV.H.
- c. Program Modifications Required by EPA. Modifications requested by EPA shall be made in writing, set forth the time schedule for the permittee(s) to develop the modifications, and offer the permittee(s) the opportunity to propose alternative program modifications to meet the objective of the requested modification. The EPA may require changes to the SWMP as needed to:
 - (i) Address impacts on receiving water quality caused, or contributed to, by discharges from the MS4;
 - (ii) Include more stringent requirements necessary to comply with new State or Federal statutory or regulatory requirements;
 - (iii) Include such other conditions deemed necessary by the EPA to comply with the goals and requirements of the Clean Water Act; or
 - (iv) If, at any time, EPA determines that the SWMP does not meet permit requirements.
- d. Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation: The permittee(s) shall implement the SWMP:
 - (i) On all new areas added to their portion of the MS4 (or for which they become responsible for implementation of stormwater quality controls) as expeditiously as possible, but not later than one (1) year from addition of the new areas. Implementation may be accomplished in a phased manner to allow additional time for controls that cannot be implemented immediately;

- (ii) Within ninety (90) days of a transfer of ownership, operational authority, or responsibility for SWMP implementation, the permittee(s) shall have a plan for implementing the SWMP on all affected areas. The plan may include schedules for implementation; and information on all new annexed areas and any resulting updates required to the SWMP shall be submitted in the annual report.
7. **Retention of Program Records.** The permittee shall retain SWMP records developed in accordance with Part I.D, Part IV.P, and Part VI for at least five (5) years after coverage under this permit terminates.
 8. **Qualifying State, Tribal or Local Program.** The permittee may substitute the BMPs and measurable goals of an existing storm water pollution control program to qualify for compliance with one or more of the minimum control measures if the existing measure meets the requirements of the minimum control measure as established in Part I.D.5

PART II. NUMERIC DISCHARGE LIMITATIONS

A. DISCHARGE LIMITATIONS. Reserved

PART III. MONITORING, ASSESSMENT, AND REPORTING REQUIREMENTS:

A. MONITORING AND ASSESSMENT

The permittee must develop, in consultation with NMED and EPA (and affected Tribes if monitoring locations would be located on Tribal lands), and implement a comprehensive monitoring and assessment program designed to meet the following objectives:

- Assess compliance with this permit;
- Assess the effectiveness of the permittee's stormwater management program;
- Assess the impacts to receiving waters resulting from stormwater discharges;
- Characterize stormwater discharges;
- Identify sources of elevated pollutant loads and specific pollutants;
- Detect and eliminate illicit discharges and illegal connections to the MS4; and
- Assess the overall health and evaluate long-term trends in receiving water quality.

The permittee shall select specific monitoring locations sufficient to assess effects of storm water discharges on receiving waters. The monitoring program may take advantage of monitoring stations/efforts utilized by the permittees or others in previous stormwater monitoring programs or other water quality monitoring efforts. Data collected by others at such stations may be used to satisfy part, or all, of the permit monitoring requirements provided the data collection by that party meets the requirements established in Part III.A.1 throughout Part III.A.5. The comprehensive monitoring and assessment program shall be described in the SWMP document and the results must be provided in each annual report.

Implementation of the comprehensive monitoring and assessment program may be achieved through participation with other permittees to satisfy the requirements of Part III.A.1 throughout Part III.A.5 below in lieu of creating duplicate program elements for each individual permittee.

1. **Wet Weather Monitoring:** The permittees shall conduct wet weather monitoring to gather information on the response of receiving waters to wet weather discharges from the MS4 during both wet season (July 1 through October 31) and dry Season (November 1 through June 30). Wet Weather Monitoring shall be conducted at outfalls, internal sampling stations, and/or in-stream monitoring locations at each water of the US that runs in each entity or entities' jurisdiction(s). Permittees may choose either Option A or Option B below:

- a. *Option A:* Individual monitoring

- (i) Class A: Perform wet weather monitoring at a location coming into the MS4 jurisdictional area (upstream) and leaving the MS4 jurisdictional area (downstream), see Appendix D. Monitor for TSS, TDS, COD, BOD₅, DO, oil and grease, *E.coli*, pH, total kjeldahl nitrogen, nitrate plus nitrite, dissolved phosphorus, total ammonia plus organic nitrogen, total phosphorus, PCBs and gross alpha. Monitoring of temperature shall be also conducted at outfalls and/or Rio Grande monitoring locations. Phase I permittees must include additional parameters from monitoring conducted under permit NMS000101 (from last 10 years) whose mean values are at or above a WQS. Permittee must sample these pollutants a minimum of 10 events during the permit term with at least 5 events in wet season and 4 events in dry season.
- (ii) Class B, C, and D: Perform wet weather monitoring at a location coming into the MS4 jurisdictional area (upstream) and leaving the MS4 jurisdictional area (downstream), see Appendix D. Monitor for TSS, TDS, COD, BOD₅, DO, oil and grease, *E.coli*, pH, total kjeldahl nitrogen, nitrate plus nitrite, dissolved phosphorus, total ammonia plus organic nitrogen, total phosphorus, PCBs and gross alpha. Monitoring of temperature shall be also

conducted at outfalls and/or Rio Grande monitoring locations. If applicable, include additional parameters from monitoring conducted under permits NMR040000 or/and NMR04000I whose mean values are at or above a WQS; sample these pollutants a minimum of 8 events per location during the permit term with at least 4 events in wet season and 2 events in dry season.

b. *Option B: Cooperative Monitoring Program*

Develop a cooperative wet weather monitoring program with other permittees in the Middle Rio Grande watershed (see map in Appendix A). The program will monitor waters coming into the watershed (upstream) and leaving the watershed (downstream), see suggested sampling locations in Appendix D. The program must include sampling for TSS, TDS, COD, BOD5, DO, oil and grease, *E. coli*, pH, total kjeldahl nitrogen, nitrate plus nitrite, dissolved phosphorus, total ammonia plus organic nitrogen, total phosphorus, PCBs and Gross alpha. Monitoring of temperature shall be also conducted at outfalls and/or Rio Grande monitoring locations. Permittees must include additional parameters from monitoring conducted under permits NMS000101, NMR040000 or/and NMR04000I whose mean values are at or above a WQS. The monitoring program must sample the pollutants for a minimum of 7 storm events per location during the permit term with at least 3 events wet season and 2 events in dry season.

Note: Seasonal monitoring periods are: Wet Season: July 1 through October 31; Dry Season: November 1 through June 30.

- c. Wet weather monitoring shall be performed only when the predicted (or actual) rainfall magnitude of a storm event is greater than 0.25 inches and an antecedent dry period of at least forty-eight (48) hours after a rain event greater than 0.1 inch in magnitude is satisfied. Monitoring methodology will consist of collecting a minimum of four (4) grab samples spaced at a minimum interval of fifteen (15) minutes each (or a flow weighted automatic composite, see Part III.A.5.a.(i)). Individual grab samples shall be preserved and delivered to the laboratory where samples will be combined into a single composite sample from each monitoring location.
- d. Monitoring methodology at each MS4 monitoring location shall be collected during any portion of the monitoring location's discharge hydrograph (i.e. first flush, rising limb, peak, and falling limb) after a discernible increase in flow at the tributary inlet.
- e. The permittee must comply with the schedules contained in Table 10. The results of the Wet Weather Monitoring must be provided in each annual report.
- f. DO, pH, conductivity, and temperature shall be analyzed in the field within fifteen (15) minutes of sample collection.
- g. Alternate wet weather monitoring locations established in Part III.A.1.a or Part III.A.1.b may be substituted for just cause during the term of the permit. Requests for approval of alternate monitoring locations shall be made to the EPA and NMED in writing and include the rationale for the requested monitoring station relocation. Unless disapproved by the EPA, use of an alternate monitoring location (except for those with numeric effluent limitations) may commence thirty (30) days from the date of the request. For monitoring locations where numeric effluent limitations have been established, the permit must be modified prior to substitution of alternate monitoring locations. At least six (6) samples shall be collected during the first year of monitoring at substitute monitoring locations. If there are less than six sampleable events, this should be documented for reporting purposes.

- h. Response to monitoring results: The monitoring program must include a contingency plan for collecting additional monitoring data within the MS4 or at additional appropriate instream locations should monitoring results indicate that MS4 discharges may be contributing to instream exceedances of WQS. The purpose of this additional monitoring effort would be to identify sources of elevated pollutant loadings so they could be addressed by the SWMP.

Table 10. Wet Weather Monitoring Program Implementation Schedules:

Activity	Permittee Class				
	A Phase I MS4s	B Phase II MS4s (2000 Census)	C New Phase II MS4s (2010 Census **)	D MS4s within Indian Lands	Cooperative (*) Any Permittee with cooperative programs
Submit wet weather monitoring preference to EPA (i.e., individual monitoring program vs. cooperative monitoring program) with NOI submittals	NOI submittal Deadline (see Table 1)	NOI submittal Deadline (see Table 1)	NOI submittal Deadline (see Table 1)	NOI submittal Deadline (see Table 1)	NOI submittal Deadline (see Table 1)
Submit a detailed description of the monitoring scheme to EPA and NMED for approval. The monitoring scheme should include: a list of pollutants; a description of monitoring sites with an explanation of why those sites were selected; and a detailed map of all proposed monitoring sites	Ten (10) months from effective date of permit	Ten (10) months from effective date of permit	Eleven (11) months from effective date of permit	Eleven (11) months from effective date of permit	Twelve (12) months from effective date of permit
Submit certification that all wet weather monitoring sites are operational and begin sampling	March 22, 2016	March 22, 2016	May 21, 2016	May 21, 2016	June 21, 2016
Update SWMP document and submit annual reports	Annually	Annually	Annually	Annually	Annually

(**) or MS4s designated by the Director

Note: The deadlines established in this table may be extended by the Director for any MS4 designated as needing a permit after issuance of this permit to accommodate expected date of permit coverage.

2. **Dry Weather Discharge Screening of MS4:** Each permittee shall identify, investigate, and address areas within its jurisdiction that may be contributing excessive levels of pollutants to the Municipal Separate Storm Sewer System as a result of dry weather discharges (i.e., discharges from separate storm sewers that occur without the direct influence of runoff from storm events, e.g. illicit discharges, allowable non-stormwater, groundwater infiltration, etc.). Due to the arid and semi-arid conditions of the area, the dry weather discharges screening program may be carried out during both wet season (July 1 through October 31) and dry Season (November 1 through June 30). Results of the assessment

shall be provided in each annual report. This program may be coordinated with the illicit discharge detection and elimination program required in Part I.D.5.e. The dry weather screening program shall be described in the SWMP and comply with the schedules contained in Part I.D.5.e.(iii). The permittee shall

- a. Include sufficient screening points to adequately assess pollutant levels from all areas of the MS4.
 - b. Screen for, at a minimum, BOD₅, sediment or a parameter addressing sediment (e.g., TSS or turbidity), E. coli, Oil and Grease, nutrients, any pollutant that has been identified as cause of impairment of a waterbody receiving discharges from that portion of the MS4, including temperature.
 - c. Specify the sampling and non-sampling techniques to be issued for initial screening and follow-up purposes. Sample collection and analysis need not conform to the requirements of 40 CFR Part 136; and
 - d. Perform monitoring only when an antecedent dry period of at least seventy-two (72) hours after a rain event greater than 0.1 inch in magnitude is satisfied. Monitoring methodology shall consist of collecting a minimum of four (4) grab samples spaced at a minimum interval of fifteen (15) minutes each. Grab samples will be combined into a single composite sample from each station, preserved, and delivered to the laboratory for analysis. A flow weighted automatic composite sample may also be used.
3. **Floatable Monitoring:** The permittees shall establish locations for monitoring/assessing floatable material in discharges to and/or from their MS4. Floatable material shall be monitored at least twice per year at priority locations and at minimum of two (2) stations except as provided in Part III.A.3. below. The amount of collected material shall be estimated in cubic yards.
- a. One (1) station should be located in the North Diversion (only applicable to the COA and AMAFCA).
 - b. Non-traditional MS4 as defined in Part VII shall sample/assess at one (1) station.
 - c. Phase II MS4s shall sample/assess at one (1) station within their jurisdiction or participate in a cooperative floatable monitoring plan addressing impacts on perennial waters of the US on a larger watershed basis.

A cooperative monitoring program may be established in partnership with other MS4s to monitor and assess floatable material in discharges to and/or from a joint jurisdictional area or watershed basis.

4. **Industrial and High Risk Runoff Monitoring** (Applicable only to Class A permittees): The permittees shall monitor stormwater discharges from Type 1 and 2 industrial facilities which discharge to the MS4 provided such facilities are located in their jurisdiction. (Note: if no such facilities are in the permittee's jurisdiction, the permittee must certify that this program element does not apply). The permittee shall:
- a. Conduct analytical monitoring of Type 1 facilities that discharge to the MS4. Type 1 facilities are municipal landfills; hazardous waste treatment, disposal and recovery facilities; facilities that are subject to EPCRA Title III, Section 313; and industrial facilities the permittee(s) determines are contributing a substantial pollutant loading to the MS4.
 - (i) The following parameters shall be monitored:
 - any pollutants limited in an existing NPDES permit to a subject facility;

- oil and grease;
 - chemical oxygen demand (COD);
 - pH;
 - biochemical oxygen demand, five-day (BOD₅);
 - total suspended solids (TSS);
 - total phosphorous;
 - total Kjeldahl nitrogen (TKN);
 - nitrate plus nitrite nitrogen;
 - any discharge information required under 40 CFR §122.21(g)(7)(iii) and (iv);
 - total cadmium;
 - total chromium;
 - total copper;
 - total lead;
 - total nickel;
 - total silver;
 - total zinc; and,
 - PCBs.
- (ii) Frequency of monitoring shall be established by the permittee(s), but may not be less than once per year;
- (iii) In lieu of the above parameter list, the permittee(s) may alter the monitoring requirement for any individual Type 1 facility:
- (a) To coincide with the corresponding industrial sector-specific monitoring requirements of the 2008 Multi-Sector General Stormwater Permit or any applicable general permit issued after September 2008. This exception is not contingent on whether a particular facility is actually covered by the general permit; or
 - (b) To coincide with the monitoring requirements of any individual permit for the stormwater discharges from that facility, and
 - (c) Any optional monitoring list must be supplemented by pollutants of concern identified by the permittee(s) for that facility.
- b. Conduct appropriate monitoring (e.g. analytic, visual), as determined by the permittee(s), at Type 2 facilities that discharge to the MS4. Type 2 facilities are other municipal waste treatment, storage, or disposal facilities (e.g. POTWs, transfer stations, incinerators) and industrial or commercial facilities the permittee(s) believed contributing pollutants to the MS4. The permittee shall include in each annual report, a list of parameters of concern and monitoring frequencies required for each type of facility.
- c. May use analytical monitoring data, on a parameter-by-parameter basis, that a facility has collected to comply with or apply for a State or NPDES discharge permit (other than this permit), so as to avoid unnecessary cost and duplication of effort;
- d. May allow the facility to test only one (1) outfall and to report that the quantitative data also apply to the substantially identical outfalls if:
- (i) A Type 1 or Type 2 industrial facility has two (2) or more outfalls with substantially identical effluents, and

(ii) Demonstration by the facility that the stormwater outfalls are substantially identical, using one (1) or all of the following methods for such demonstration. The NPDES Stormwater Sampling Guidance Document (EPA 833-B-92-001), available on EPA's website at provides detailed guidance on each of the three options: (1) submission of a narrative description and a site map; (2) submission of matrices; or (3) submission of model matrices.

b. May accept a copy of a "no exposure" certification from a facility made to EPA under 40 CFR §122.26(g), in lieu of analytic monitoring.

5. **Additional Sample Type, Collection and Analysis:**

a. **Wet Weather (or Storm Event) Discharge Monitoring:** If storm event discharges are collected to meet the objectives of the Comprehensive Monitoring and Assessment Program required in Part III.A (e.g., assess compliance with this permit; assess the effectiveness of the permittee's stormwater management program; assess the impacts to receiving waters resulting from stormwater discharges), the following requirements apply:

(i) **Composite Samples:** Flow-weighted composite samples shall be collected as follows:

(a) **Composite Method –** Flow-weighted composite samples may be collected manually or automatically. For both methods, equal volume aliquots may be collected at the time of sampling and then flow-proportioned and composited in the laboratory, or the aliquot volume may be collected based on the flow rate at the time of sample collection and composited in the field.

(b) **Sampling Duration –** Samples shall be collected for at least the first three (3) hours of discharge. Where the discharge lasts less than three (3) hours, the permittee should report the value. .

(c) **Aliquot Collection –** A minimum of three (3) aliquots per hour, separated by at least fifteen (15) minutes, shall be collected. Where more than three (3) aliquots per hour are collected, comparable intervals between aliquots shall be maintained (e.g. six aliquots per hour, at least seven (7) minute intervals).

(ii) **Grab Samples:** Grab samples shall be taken during the first two (2) hours of discharge.

b. **Analytical Methods:** Analysis and collection of samples shall be done in accordance with the methods specified at 40 CFR §136. Where an approved 40 CFR §136 method does not exist, any available method may be used unless a particular method or criteria for method selection (such as sensitivity) has been specified in the permit. The minimum quantification levels (MQLs) in Appendix F are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

Screening level tests may utilize less expensive "field test kits" using test methods not approved by EPA under 40 CFR 136, provided the manufacturers published detection ranges are adequate for the illicit discharge detection purposes.

EPA Method 1668 shall be utilized when PCB water column monitoring is conducted to determine compliance with permit requirements. For purposes of sediment sampling in dry weather as part of a screening program to identify area(s) where PCB control/clean-up efforts may need to be focused, either the Arochlor test (EPA Method 8082) or USGS test method (8093) may be utilized, but must use EPA Method 1668 (latest revision) for confirmation and determination of specific PCB levels at that location.

EPA Method 900.0 shall be utilized when gross alpha water column monitoring is conducted to determine compliance with permit requirements.

B. ANNUAL REPORT

The permittees shall submit an annual report to be submitted by no later than **December 1st**. See suggested form at <http://epa.gov/region6/water/npdes/sw/ms4/index.htm>. The report shall cover the previous year from **July 1st to June 30rd** and include the below separate sections. Additionally, the year one (1) and year four (4) annual report shall include submittal of a complete SWMP revision.

At least forty five (45) days prior to submission of each Annual Report, the permittee must provide public notice of and make available for public review and comment a draft copy of the Annual Report. All public input must be considered in preparation of the final Annual Reports and any changes to the SWMP.

Note: A complete copy of the signed Annual Report should be maintained on site.

1. **SWMP(s) status of implementation**: shall include the status of compliance with all schedules established under this permit and the status of actions required in Parts I, III, and VI.
2. **SWMP revisions**: shall include revisions, if necessary, to the assessments of controls or BMPs reported in the permit application (or NOI for coverage under this permit) under 40 CFR §122.26(d)(2)(v) and §122.34(d)(1)(i) are to be included, as well as a cumulative list of all SWMP revisions during the permit term.

Class A permittees shall include revisions, if necessary, to the fiscal analysis reported in the permit application (or NOI for coverage under this permit) under §122.26(d)(2)(vi).

3. **Performance assessment**: shall include:
 - a. an assessment of performance in terms of measurable goals, including, but not limited to, a description of the number and nature of enforcement actions and inspections, public education and public involvement efforts;
 - b. a summary of the data, including monitoring data, that is accumulated throughout the monitoring year (July 1 to June 30); actual values of representative monitoring results shall be included, if results are above minimum quantification level (MQL); and
 - c. an identification of water quality improvements or degradation.
4. **Annual expenditures**: for the reporting period, with a breakdown for the major elements of the stormwater management program and the budget for the year following each annual report. (Applicable only to Class A permittees)
5. **Annual Report Responsibilities for Cooperative Programs**: preparation of a system-wide report with cooperative programs may be coordinated among cooperating MS4s and then used as part of individual Annual Reports. The report of a cooperative program element shall indicate which, if any, permittee(s) have failed to provide the required information on the portions of the MS4 for which they are responsible to the cooperation permittees.
 - a. Joint responsibility for reports covering cooperative programs elements shall be limited to participation in preparation of the overview for the entire system and inclusion of the identity of any permittee who failed to provide input to the annual report.

- b. Individual permittees shall be individually responsible for content of the report relating to the portions of the MS4 for which they are responsible and for failure to provide information for the system-wide annual report no later than July 31st of each year.
6. **Public Review and Comment:** a brief summary of any issues raised by the public on the draft Annual Report, along with permittee's responses to the public comments.
7. **Signature on Certification of Annual Reports:** The annual report shall be signed and certified, in accordance with Part IV.H and include a statement or resolution that the permittee's governing body or agency (or delegated representative) has reviewed or been apprised of the content of the Annual Report. Annual report shall be due no later than December 1st of each year. A complete copy of the signed Annual Report should be maintained on site.

C. CERTIFICATION AND SIGNATURE OF RECORDS.

All reports required by the permit and other information requested by the EPA shall be signed and certified in accordance with Part IV.H.

D. REPORTING: WHERE AND WHEN TO SUBMIT

1. Monitoring results (Part III.A.1, Part III.A.3, Part III.A.5.a) obtained during the reporting period running from July 1st to June 30th shall be submitted on discharge monitoring report (DMR) forms along with the annual report required by Part III.B. A separate DMR form is required for each monitoring period (season) specified in Part III.A.1. If any individual analytical test result is less than the minimum quantification level (MQL) listed for that parameter, then a value of zero (0) may be used for that test result for the discharge monitoring report (DMR) calculations and reporting requirements. The annual report shall include the actual value obtained, if test result is less than the MQL (See Appendix F).
2. Signed copies of DMRs required under Part III, the Annual Report required by Part III.B, and all other reports required herein, shall be submitted in electronic form to R6_MS4Permits@epa.gov (note: there is an underscore between R6 and MS4).

Copy of a suggested Annual Report Format is located in EPA R6 website:
<http://epa.gov/region6/water/npdes/sw/ms4/index.htm>.

Electronic submittal of the documents required in the permit using a compatible Integrated Compliance Information System (ICIS) format would be allowed if available.

3. Requests for SWMP updates, modifications in monitoring locations, or application for an individual permit shall, be submitted to:

U.S. EPA, Region 6
Water Quality Protection Division
Operations Support Office (6WQ-O)
1445 Ross Avenue
Dallas, Texas 75202-2733
4. Additional Notification. Permittee(s) shall also provide copies of NOIs, DMRs, annual reports, NOTs, requests for SWMP updates, items for compliance with permit requirements for Compliance with Water Quality Standards in Part I.C.1, TMDL's reports established in Part I.C.2, monitoring scheme, reports, and certifications required in Part III.A.1, programs or changes in monitoring locations, and all other reports required herein, to:

New Mexico Environment Department
Attn: Bruce Yurdin, Program Manager
Surface Water Quality Bureau
Point Source Regulation Section
P.O. Box 5469
Santa Fe, New Mexico 87502

Pueblo of Sandia Environment Department
Attn: Scott Bulgrin, Water Quality Manager
481 Sandia Loop
Bernalillo, NM 87004
(Note: Only those MS4s with discharges upstream of or to waters under the jurisdictional of the Pueblo of Sandia: AMAFCA, Sandoval County, Village of Corrales, City of Rio Rancho, Town of Bernalillo, SSCAFCA, and ESCAFCA)

Pueblo of Isleta
Attn: Ramona M. Montoya, Environment Division Manager
P.O. Box 1270
Isleta NM 87022

(Notes: Only the City of Albuquerque, Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), New Mexico Department of Transportation (NMDOT) District 3, KAFB (Kirtland Air Force Base), Sandia Labs (DOE), and Bernalillo County). All parties submitting an NOI or NOT shall notify the Pueblo of Isleta in writing that a NOI or NOT has been submitted to EPA

Water Resources Division Manager
Pueblo of Santa Ana
2 Dove Road
Santa Ana Pueblo, New Mexico 87004
(Note: Only those MS4s with discharges upstream of or to waters under the jurisdictional of the Pueblo of Santa Ana)

PART IV. STANDARD PERMIT CONDITIONS

A. DUTY TO COMPLY.

The permittee(s) must comply with all conditions of this permit insofar as those conditions are applicable to each permittee, either individually or jointly. Any permit noncompliance constitutes a violation of the Clean Water Act (The Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

B. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS.

The EPA will adjust the Civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (Federal Register: Dec. 31, 1996, Volume 61, No. 252, pages 69359-69366, as corrected, March 20, 1997, Volume 62, No. 54, pages 13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every four years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties listed below were adjusted for inflation starting in 1996.

1. Criminal Penalties.

- a. **Negligent Violations:** The Act provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one (1) year, or both.
- b. **Knowing Violations:** The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than three (3) years, or both.
- c. **Knowing Endangerment:** The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than \$250,000, or by imprisonment for not more than fifteen (15) years, or both.
- d. **False Statement:** The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two (2) years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both. (See Section 309(c)(4) of the Act).

2. **Civil Penalties.** The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed \$27,500 per day for each violation.

3. **Administrative Penalties.** The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

- a. **Class I penalty:** Not to exceed \$11,000 per violation nor shall the maximum amount exceed \$27,500.

- b. Class II penalty: Not to exceed \$11,000 per day for each day during which the violation continues nor shall the maximum amount exceed \$137,500.
- C. **DUTY TO REAPPLY.** If the permittee wishes to continue an activity regulated by this permit after the permit expiration date, the permittee must apply for and obtain a new permit. The application shall be submitted at least 180 days prior to expiration of this permit. The EPA may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be governed by regulations promulgated at 40 CFR §122.6 and any subsequent amendments.
- D. **NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- E. **DUTY TO MITIGATE.** The permittee(s) shall take all reasonable steps to control or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- F. **DUTY TO PROVIDE INFORMATION.** The permittee(s) shall furnish to the EPA, within a time specified by the EPA, any information which the EPA may request to determine compliance with this permit. The permittee(s) shall also furnish to the EPA upon request copies of records required to be kept by this permit.
- G. **OTHER INFORMATION.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in any report to the EPA, he or she shall promptly submit such facts or information.
- H. **SIGNATORY REQUIREMENTS.** For a municipality, State, or other public agency, all DMRs, SWMPs, reports, certifications or information either submitted to the EPA or that this permit requires be maintained by the permittee(s), shall be signed by either a:
 1. Principal executive officer or ranking elected official; or
 2. Duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the EPA.
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or any individual occupying a named position.
 3. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new written authorization satisfying the requirements of this paragraph must be submitted to the EPA prior to or together with any reports, information, or applications to be signed by an authorized representative.
 4. Certification: Any person signing documents under this section shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- I. PENALTIES FOR FALSIFICATION OF MONITORING SYSTEMS.** The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by fines and imprisonment described in Section 309 of the Act.
- J. OIL AND HAZARDOUS SUBSTANCE LIABILITY.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the Act or section 106 of CERCLA.
- K. PROPERTY RIGHTS.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- L. SEVERABILITY.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.
- M. REQUIRING A SEPARATE PERMIT.**
1. The EPA may require any permittee authorized by this permit to obtain a separate NPDES permit. Any interested person may petition the EPA to take action under this paragraph. The Director may require any permittee authorized to discharge under this permit to apply for a separate NPDES permit only if the permittee has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form (as necessary), a statement setting a deadline for the permittee to file the application, and a statement that on the effective date of the separate NPDES permit, coverage under this permit shall automatically terminate. Separate permit applications shall be submitted to the address shown in Part III.D. The EPA may grant additional time to submit the application upon request of the applicant. If an owner or operator fails to submit, prior to the deadline of the time extension, a separate NPDES permit application as required by the EPA, then the applicability of this permit to the permittee is automatically terminated at the end of the day specified for application submittal.
 2. Any permittee authorized by this permit may request to be excluded from the coverage of this permit by applying for a separate permit. The permittee shall submit a separate application as specified by 40 CFR §122.26(d) for Class A permittees and by 40 CFR §122.33(b)(2) for Class B, C, and D permittees, with reasons supporting the request to the Director. Separate permit applications shall be submitted to the address shown in Part III.D.3. The request may be granted by the issuance of a separate permit if the reasons cited by the permittee are adequate to support the request.
 3. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the permittee is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an operator otherwise subject to this permit, or the operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the permitting authority.
- N. STATE / ENVIRONMENTAL LAWS.**
1. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by section 510 of the Act.

2. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

O. PROPER OPERATION AND MAINTENANCE. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of stormwater management programs. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

P. MONITORING AND RECORDS.

1. The permittee must retain records of all monitoring information, including, all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, copies of Discharge Monitoring Reports (DMRs), a copy of the NPDES permit, and records of all data used to complete the NOI for this permit, for a period of at least three years from the date of the sample, measurement, report or application, or for the term of this permit, whichever is longer. This period may be extended by request of the permitting authority at any time.
2. The permittee must submit its records to the permitting authority only when specifically asked to do so. The permittee must retain a description of the SWMP required by this permit (including a copy of the permit language) at a location accessible to the permitting authority. The permittee must make its records, including the NOI and the description of the SWMP, available to the public if requested to do so in writing.
3. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The initials or name(s) of the individual(s) who performed the sampling or measurements;
 - c. The date(s) analyses were performed;
 - d. The time(s) analyses were initiated;
 - e. The initials or name(s) of the individual(s) who performed the analyses;
 - f. References and written procedures, when available, for the analytical techniques or methods used; and
 - g. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.
4. The permittee must maintain, for the term of the permit, copies of all information and determinations used to document permit eligibility under Parts I.A.5.f and Part I.A.3.b.

Q. MONITORING METHODS. Monitoring must be conducted according to test procedures approved under 40 CFR §136, unless other test procedures have been specified in this permit. The minimum quantification levels (MQLs) in Appendix F are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

R. INSPECTION AND ENTRY. The permittee shall allow the EPA or an authorized representative of EPA, or the State, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;

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3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
 4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Act, any substance or parameters at any location.
- S. PERMIT ACTIONS.** This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
- T. ADDITIONAL MONITORING BY THE PERMITTEE(S).** If the permittee monitors more frequently than required by this permit, using test procedures approved under 40 CFR §136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR). Such increased monitoring frequency shall also be indicated on the DMR.
- U. ARCHEOLOGICAL AND HISTORIC SITES** (Applicable to areas within the corporate boundary of the City of Albuquerque and Tribal lands). This permit does not authorize any stormwater discharges nor require any controls to control stormwater runoff which are not in compliance with any historic preservation laws.
1. In accordance with the Albuquerque Archaeological Ordinance (Section 2-12-2, 14-16-5, and 14-14-3-4), an applicant for either:
 - a. A preliminary plan for any subdivision that is five acres or more in size; or
 - b. A site development plan or master development plan for a project that is five acres or more in size on property that is zoned SU-1 Special Use, IP Industrial Park, an SU-2 zone that requires site plan review, PC Planned Community with a site, or meets the Zoning Code definition of a Shopping Center must first obtain either a Certificate of No Effect or a Certificate of Approval from the City Archaeologist. Details of the requirements for a Certificate of No Effect or a Certificate of Approval are described in the ordinance. Failure to obtain a certificate as required by ordinance shall subject the property owner to the penalties of §1-1-99 ROA 1994.
 2. If municipal excavation and/or construction projects implementing requirements of this permit will result in the disturbance of previously undisturbed land, and the project is not required to have a separate NPDES permit (e.g. general permit for discharge of stormwater associated with construction activity), then the permittee may seek authorization for stormwater discharges from such sites of disturbance by:
 - a. Submitting, thirty (30) days prior to commencing land disturbance, the following to the State Historic Preservation Officer (SHPO) and to appropriate Tribes and Tribal Historic Preservation Officers for evaluation of possible effects on properties listed or eligible for listing on the National Register of Historic Places:
 - (i) A description of the construction or land disturbing activity and the potential impact that this activity may have upon the ground, and
 - (ii) A copy of a USGS topographic map outlining the location of the project and other ancillary impact areas.
 - (iii) The addresses of the SHPO, Sandia Pueblo, and Isleta Pueblo are:

State Historic Preservation Officer
New Mexico Historic Preservation Division

Bataan Memorial Building
407 Galisteo Street, Ste. 236
Santa Fe, New Mexico 87501

Pueblo of Sandia Environment Department
Attn: Frank Chaves, Environment Director
481 Sandia Loop
Bernalillo, New Mexico 87004

Pueblo of Isleta
Department of Cultural and Historic Preservation
Attn: Daniel Waseta, Director
P.O. Box 1270
Isleta NM 87022

Water Resources Division Manager
Pueblo of Santa Ana
2 Dove Road
Santa Ana Pueblo, New Mexico 87004

3. If the permittee receives a request for an archeological survey or notice of adverse effects from the SHPO, the permittee shall delay such activity until:
 - a. A cultural resource survey report has been submitted to the SHPO for a review and a determination of no effect or no adverse effect has been made, and
 - b. If an adverse effect is anticipated, measures to minimize harm to historic properties have been agreed upon between the permittee and the SHPO.
 4. If the permittee does not receive notification of adverse effects or a request for an archeological survey from the SHPO within thirty (30) days, the permittee may proceed with the activity.
 5. Alternately, the permittee may obtain authorization for stormwater discharges from such sites of disturbance by applying for a modification of this permit. The permittee may apply for a permit modification by submitting the following information to the Permitting Authority 180 days prior to commencing such discharges:
 - a. A letter requesting a permit modification to include discharges from activities subject to this provision, in accordance with the signatory requirements in Part IV.H.
 - b. A description of the construction or land disturbing activity and the potential impact that this activity may have upon the ground; County in which the facility will be constructed; type of facility to be constructed; size area (in acres) that the facility will encompass; expected date of construction; and whether the facility is located on land owned or controlled by any political subdivision of New Mexico; and
 - c. A copy of a USGS topographic map outlining the location of the project and other ancillary impact areas.
- V. **CONTINUATION OF THE EXPIRED GENERAL PERMIT.** If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedures Act and remain in force and effect. Any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of:

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1. Reissuance or replacement of this permit, at which time the permittee must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or
 2. Issuance of an individual permit for your discharges; or
 3. A formal permit decision by the permitting authority not to reissue this general permit, at which time the permittee must seek coverage under an alternative general permit or an individual permit.
- W. **PERMIT TRANSFERS:** This permit is not transferable to any person except after notice to the permitting authority. The permitting authority may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.
- X. **ANTICIPATED NONCOMPLIANCE.** The permittee must give advance notice to the permitting authority of any planned changes in the permitted small MS4 or activity which may result in noncompliance with this permit. (see
- Y. **PROCEDURES FOR MODIFICATION OR REVOCATION:** Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64 and 124.5.

PART V. PERMIT MODIFICATION

A. MODIFICATION OF THE PERMIT. The permit may be reopened and modified, in accordance with 40 CFR §122.62, §122.63, and §124.5, during the life of the permit to address:

1. Changes in the State's Water Quality Management Plan, including Water Quality Standards;
2. Changes in applicable water quality standards, statutes or regulations;
3. A new permittee who is the owner or operator of a portion of the MS4;
4. Changes in portions of the SWMP that are considered permit conditions;
5. Construction activities implementing requirements of this permit that will result in the disturbance of previously undisturbed land and not required to have a separate NPDES permit; or
6. Other modifications deemed necessary by the EPA to meet the requirements of the Act.

B. MODIFICATION OF THE SWMP(s). Only those portions of the SWMPs specifically required as permit conditions shall be subject to the modification requirements of 40 CFR §124.5. Addition of components, controls, or requirements by the permittee(s); replacement of an ineffective or infeasible control implementing a required component of the SWMP with an alternate control expected to achieve the goals of the original control; and changes required as a result of schedules contained in Part VI shall be considered minor changes to the SWMP and not modifications to the permit. (See also Part I.D.6)

C. CHANGES IN REPRESENTATIVE MONITORING SITES. Changes in monitoring sites, other than those with specific numeric effluent limitations (as described in Part III.A.1.g), shall be considered minor modifications to the permit and shall be made in accordance with the procedures at 40 CFR §122.63.

PART VI. SCHEDULES FOR IMPLEMENTATION AND COMPLIANCE.

- A. IMPLEMENTATION AND AUGMENTATION OF THE SWMP(s).** The permittee(s) shall comply with all elements identified in Parts I and III for SWMP implementation and augmentation, and permit compliance. The EPA shall have sixty (60) days from receipt of a modification or augmentation made in compliance with Part VI to provide comments or request revisions. During the initial review period, EPA may extend the time period for review and comment. The permittee(s) shall have thirty (30) days from receipt of the EPA's comments or required revisions to submit a response. All changes to the SWMP or monitoring plans made to comply with schedules in Parts I and III must be approved by EPA prior to implementation.
- B. COMPLIANCE WITH EFFLUENT LIMITATIONS.** Reserved.
- C. REPORTING COMPLIANCE WITH SCHEDULES.** No later than fourteen (14) days following a date for a specific action (interim milestone or final deadline) identified in the Part VI schedule(s), the permittee(s) shall submit a written notice of compliance or noncompliance to the EPA in accordance with Part III.D.
- D. MODIFICATION OF THE SWMP(s).** The permittee(s) shall modify its SWMP, as appropriate, in response to modifications required in Part VI.A. Such modifications shall be made in accordance with Part V.B.

PART VII. DEFINITIONS

All definitions contained in Section 502 of the Act shall apply to this permit and are incorporated herein by reference. Unless otherwise specified, additional definitions of words or phrases used in this permit are as follows:

- (1) **Baseline Load** means the load for the pollutant of concern which is present in the waterbody before BMPs or other water quality improvement efforts are implemented.
- (2) **Best Management Practices (BMPs)** means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- (3) **Bioretention** means the water quality and water quantity stormwater management practice using the chemical, biological and physical properties of plants, microbes and soils for the removal of pollution from stormwater runoff.
- (4) **Canopy Interception** means the interception of precipitation, by leaves and branches of trees and vegetation that does not reach the soil.
- (5) **Contaminated Discharges:** The following discharges are considered contaminated:
 - Has had a discharge resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 117.21 or 40 CFR 302.6 at any time since November 16, 1987; or
 - Has had a discharge resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 110.6 at any time since November 16, 1987; or
 - Contributes to a violation of an applicable water quality standard.
- (6) **Controls or Control Measures or Measures** means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or control the pollution of waters of the United States. Controls also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- (7) **Controllable Sources:** Sources, private or public, which fall under the jurisdiction of the MS4.
- (8) **CWA or The Act** means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.
- (9) **Co-permittee** means a permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator.
- (10) **Composite Sample** means a sample composed of two or more discrete samples. The aggregate sample will reflect the average water quality covering the compositing or sample period.
- (11) **Core Municipality** means, for the purpose of this permit, the municipality whose corporate boundary (unincorporated area for counties and parishes) defines the municipal separate storm sewer system. (ex. City of Dallas for the Dallas Municipal Separate Storm Sewer System, Harris County for unincorporated Harris County).
- (12) **Direct Connected Impervious Area (DCIA)** means the portion of impervious area with a direct hydraulic connection to the permittee's municipal separate storm sewer system or a waterbody via continuous paved surfaces, gutters, pipes, and other impervious features. Direct connected impervious area typically does not include isolated impervious areas with an indirect hydraulic connection to the municipal separate storm sewer system (e.g., swale or detention basin) or that otherwise drain to a pervious area.
- (13) **Director** means the Regional Administrator or an authorized representative.
- (14) **Discharge** for the purpose of this permit, unless indicated otherwise, means discharges from the municipal separate storm sewer system.
- (15) **Discharge-related activities** include: activities which cause, contribute to, or result in storm water point source pollutant discharges; and measures to control storm water discharges, including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.
- (16) **Engineered Infiltration** means an underground device or system designed to accept stormwater and slowly exfiltrates it into the underlying soil. This device or system is designed based on soil tests that define the exfiltration rate.
- (17) **Evaporation** means rainfall that is changed or converted into a vapor.
- (18) **Evapotranspiration** means the sum of evaporation and transpiration of water from the earth's surface to the atmosphere. It includes evaporation of liquid or solid water plus the transpiration of plants.
- (19) **Extended Filtration** means a structural stormwater practice which filters stormwater runoff through vegetation and engineered soil media. A portion of the stormwater runoff drains into an underdrain system which slowly releases it after the storm is over.

- (20) **Facility** means any NPDES "point source" or any other facility (including land or appurtenances thereto) that is subject to regulation under the NPDES program.
- (21) **Flood Control Projects** mean major drainage projects developed to control water quantity rather than quality, including channelization and detention.
- (22) **Flow-weighted composite sample** means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.
- (23) **Grab Sample** means a sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.
- (24) **Green Infrastructure** means an array of products, technologies, and practices that use natural systems -- or engineered systems that mimic natural processes -- to enhance overall environmental quality and provide utility services. As a general principal, Green Infrastructure techniques use soils and vegetation to infiltrate, evapotranspire, and/or recycle stormwater runoff. When used as components of a stormwater management system, Green Infrastructure practices such as green roofs, porous pavement, rain gardens, and vegetated swales can produce a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these technologies can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits.
- (25) **Hydromodification** means the alteration of the natural flow of water through a landscape, and often takes the form of channel straightening, widening, deepening, or relocating existing, natural stream channels. It also can involve excavation of borrow pits or canals, building of levees, streambank erosion, or other conditions or practices that change the depth, width or location of waterways. Hydromodification usually results in water quality and habitat impacts.
- (26) **Illicit connection** means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.
- (27) **Illicit discharge** means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.
- (28) **Impervious Area (IA)** means conventional pavements, sidewalks, driveways, roadways, parking lots, and rooftops.
- (29) **Indian Country** means:
- All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
 - All dependent Indian communities within the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
 - All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe.
- (30) **Individual Residence** means, for the purposes of this permit, single or multi-family residences. (e.g. single family homes and duplexes, town homes, apartments, etc.)
- (31) **Infiltration** means the process by which stormwater penetrates the soil.
- (32) **Land application unit** means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.
- (33) **Landfill** means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.
- (34) **Land Use** means the way in which land is used, especially in farming and municipal planning.
- (35) **Large or medium municipal separate storm sewer system** means all municipal separate storm sewers that are either:
- located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendix F of 40 CFR §122); or
 - located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR §122); or
 - owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.
- (36) **MEP** means maximum extent practicable, the technology-based discharge standard for municipal separate storm sewer systems to reduce pollutants in storm water discharges. A discussion of MEP as it applies to small MS4s is found at 40 CFR 122.34. CWA section 402(p)(3)(B)(iii) requires that a municipal permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system design, and engineering methods, and other provisions such as the Administrator or the State determines appropriate for the control of such pollutants.
- (37) **Measurable Goal** means a quantitative measure of progress in implementing a component of storm water management program.

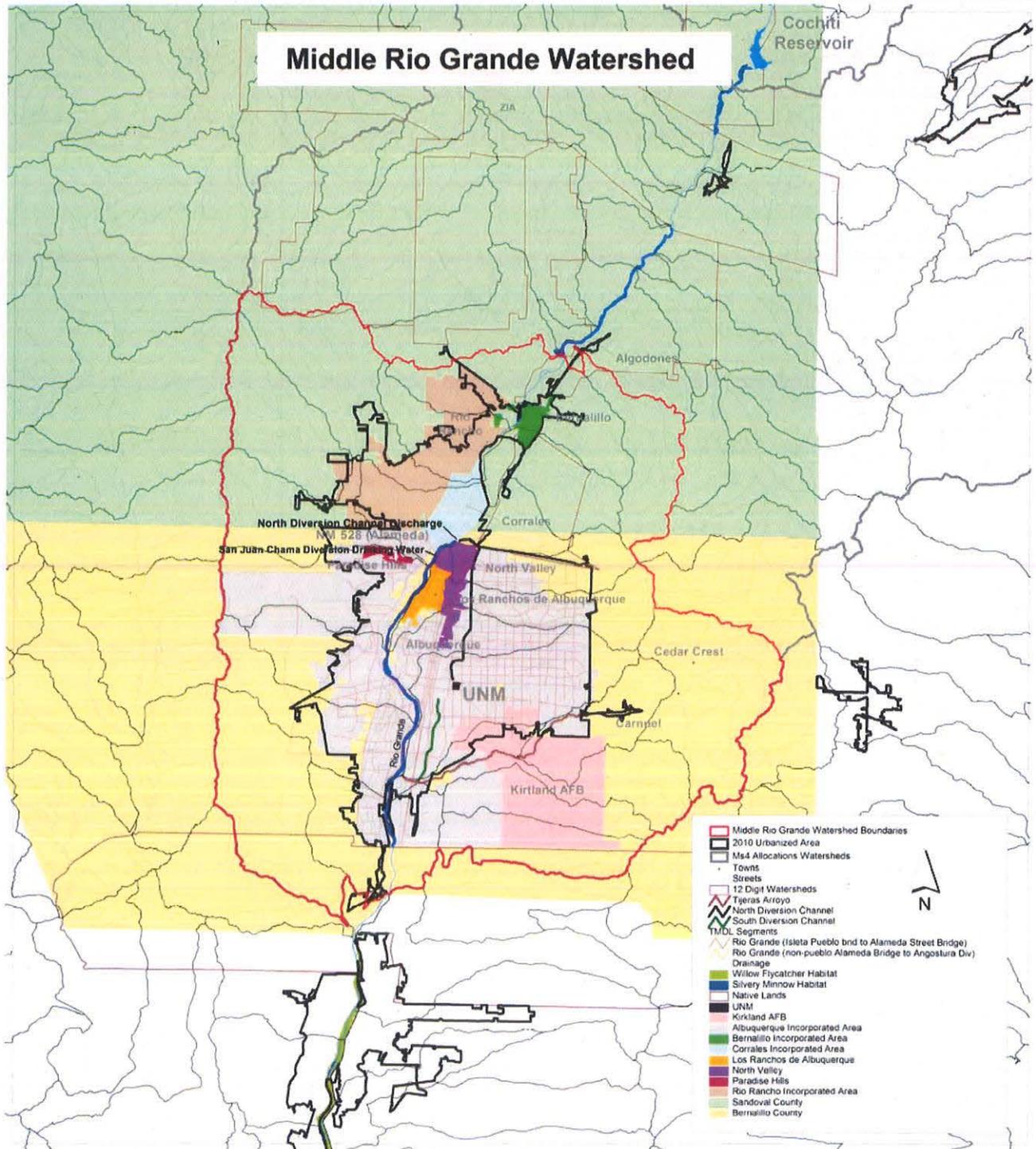
- (38) **Municipal Separate Storm Sewer (MS4)** means all separate storm sewers that are defined as "large" or "medium" or "small" municipal separate storm sewer systems pursuant to paragraphs 40 CFR §122.26(b)(4), (b)(7), and (b)(16), or designated under paragraph 40 CFR §122.26(a)(1)(v).
- (39) **Non-traditional MS4** means systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings. 40 CFR 122.26(a)(16)(iii).
- (40) **NOI** means Notice of Intent to be covered by this permit (see Part I.B of this permit)
- (41) **NOT** means Notice of Termination.
- (42) **Outfall** means a *point source* as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.
- (43) **Percent load reduction** means the difference between the baseline load and the target load divided by the baseline load.
- (44) **Owner or operator** means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.
- (45) **Permittee** refers to any person (defined below) authorized by this NPDES permit to discharge to Waters of the United States.
- (46) **Permitting Authority** means EPA, Region 6.
- (47) **Person** means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.
- (48) **Point Source** means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.
- (49) **Pollutant** is defined at 40 CFR 122.2. Pollutant means dredged spoil, solid waste, incinerator residue, filter back-wash, sewage, garbage, sewage sludge, Munitions, chemical waste, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011), heat, wrecked or discarded equipment, rock sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.
- (50) **Pre-development Hydrology**, Predevelopment hydrology is generally the rain volume at which runoff would be produced when a site or an area is in its natural condition, prior to development disturbances. For the Middle Rio Grande area, EPA considers predevelopment conditions to be a mix of woods and desert shrub.
- (51) **Rainfall and Rainwater Harvesting** means the collection, conveyance, and storage of rainwater. The scope, method, technologies, system complexity, purpose, and end uses vary from rain barrels for garden irrigation in urban areas, to large-scale collection of rainwater for all domestic uses.
- (52) **Soil amendment** means adding components to in-situ or native soils to increase the spacing between soil particles so that the soil can absorb and hold more moisture. The amendment of soils changes various other physical, chemical and biological characteristics so that the soils become more effective in maintaining water quality.
- (53) **Storm drainage projects** include stormwater inlets, culverts, minor conveyances and a host of other structures or devices.
- (54) **Storm sewer**, unless otherwise indicated, means a municipal separate storm sewer.
- (55) **Stormwater** means stormwater runoff, snow melt runoff, and surface runoff and drainage.
- (56) **Stormwater Discharge Associated with Industrial Activity** means the discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant (See 40 CFR §122.26(b)(14) for specifics of this definition).
- (57) **Target load** means the load for the pollutant of concern which is necessary to attain water quality goals (e.g. applicable water quality standards).
- (58) **Stormwater Management Program (SWMP)** means a comprehensive program to manage the quality of stormwater discharged from the municipal separate storm sewer system. For the purposes of this permit, the Stormwater Management Program is considered a single document, but may actually consist of separate programs (e.g. "chapters") for each permittee.
- (59) **Targeted controls** means practices implemented to address particular pollutant of concern. For example litter program targets floatables.
- (60) **Time-weighted composite** means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.
- (61) **Total Maximum Daily Load (TMDL)** means a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. A TMDL is the sum of individual wasteload allocations for point sources (WLA), load allocations for non-point sources and natural background (LA), and must consider seasonal variation and include a margin of safety. The TMDL comes in the form of a technical document or plan.

- (62) **Toxicity** means an LC50 of <100% effluent.
- (63) **Waste load allocation (WLA)** means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation.
- (64) **Wetlands** means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.
- (65) **Whole Effluent Toxicity (WET)** means the aggregate toxic effect of an effluent measured directly by a toxicity test.

PART VIII PERMIT CONDITIONS APPLICABLE TO SPECIFIC AREAS OR INDIAN COUNTY LANDS

Reserved

Appendix A - Middle Rio Grande Watershed Jurisdictions and Potential Permittees



Middle Rio Grande Watershed Jurisdictions and Potential Permittees

Class A:

City of Albuquerque
AMAFCFA (Albuquerque Metropolitan Arroyo Flood Control Authority)
UNM (University of New Mexico)
NMDOT (New Mexico Department of Transportation District 3)

Class B:

Bernalillo County
Sandoval County
Village of Corrales
City of Rio Rancho
Los Ranchos de Albuquerque
KAFB (Kirtland Air Force Base)
Town of Bernalillo
EXPO (State Fairgrounds/Expo NM)
SSCAFCA (Southern Sandoval County Arroyo Flood Control Authority)
NMDOT (New Mexico Department of Transportation District 3)

Class C:

ESCAFCA (Eastern Sandoval County Arroyo Flood Control Authority)
Sandia Labs (DOE)

Class D:

Pueblo of Sandia
Pueblo of Isleta
Pueblo of Santa Ana

Note: There could be additional potential permittees.

NMDOT Dist. 3 falls into the Class A type permittee, if an individual program is developed or/and implemented. The timelines for cooperative programs should be used, if NMDOT Dist. 3 cooperates with other permittees.

Appendix B - Total Maximum Daily Loads (TMDLs)

B.1. Approved Total Maximum Daily Loads (TMDLs) Tables

A bacteria TMDL for the Middle Rio Grande was approved by the New Mexico Water Quality Control Commission on April 13, 2010, and by EPA on June 30, 2010. The new TMDL modifies: 1) the indicator parameter for bacteria from fecal coliform to *E. coli*, and 2) the way the WLAs are assigned

Discharges to Impaired Waters – TMDL Waste Load Allocations (WLAs)² for *E. coli*: Rio Grande¹

Stream Segment	Stream Name	Permittee Class	FLOW CONDITIONS & ASSOCIATED WLA (cfu/day) ³				
			High	Moist	Mid-Range	Dray	Low
2105_50	Isleta Pueblo boundary to Alameda Street Bridge (based on flow at USGS Station NM08330000)	Class A ⁴	3.36x10 ¹⁰	8.41 x10 ¹⁰	5.66 x10 ¹⁰	2.09 x10 ¹⁰	4.67 x10 ⁹
		Class B ⁵ Class C ⁶	3.73 x10 ⁹	9.35 x10 ⁹	6.29 x10 ⁹	2.32 x10 ⁹	5.19 x10 ⁸
2105.1_00	non-Pueblo Alameda Bridge to Angostura Diversion (based on flow at USGS Station NM08329928)	Class A	5.25 x10 ¹⁰	1.52 x10 ¹⁰	—	5.43 x10 ⁹	2.80 x10 ⁹
		Class B Class C	2.62 x10 ¹¹	7.59 x10 ¹⁰	—	2.71 x10 ¹⁰	1.40 x10 ¹⁰

- 1 Total Maximum Daily Load for the Middle Rio Grande Watershed, NMED, 2010.
- 2 The WLAs for the stormwater MS4 permit was based on the percent jurisdiction area approach. Thus, the MS4 WLAs are a percentage of the available allocation for each hydrologic zone, where the available allocation = TMDL – WLA – MOS.
- 3 Flow conditions relate to percent of days the flow in the Rio Grande at a USGS Gauge exceeds a particular level: High 0-10%; Moist 10-40%; Mid-Range 40-60%; Dry 60-90%; and Low 90-100%. (Source: Figures 4.3 and 4.4 in 2010 Middle Rio Grande TMDL)
- 4 Phase I MS4s
- 5 Phase II MS4s (2000 Census)
- 6 New Phase II MS4s (2010 Census or MS4s designated by the Director)

Estimating Target Loadings for Particular Monitoring Location:

The Table in B.2 below provides a mechanism to calculate, based on acreage within a drainage area, a target loading value for a particular monitoring location.

B.2. Calculating Alternative Sub-measurable Goals

Individual permittees or a group of permittees seeking alternative sub-measurable goals under C.2.b.(i).(c).B should consult NMED. Preliminary proposals should be submitted with the Notice of Intent (NOI) under Part I.B.2.k according to the due dates specified in Part I.B.1.a of the permit. This proposal shall include, but is not limited to, the following items

B.2.1 Determine base loading for subwatershed areas consistent with TMDL

- a. Using the table below, the permittee must develop a target load consistent with the TMDL for any sampling point in the watershed (even if it includes area outside the jurisdictional area of the permit).

E. coli loading on a per area basis (cfu/sq mi/day)

	high	moist	mid	dry	low
Alameda to Isleta	1.79E+09	4.48E+08	3.02E+08	1.11E+08	2.58E+07
Angostura to Alameda	3.25E+09	9.41E+08	5.19E+08	3.37E+08	1.74E+08

- b. An estimation of the pertinent, subwatershed area that the permittee is responsible for and the basis for determining that area, including the means for excluding any tributary inholdings;
- c. Using the total loading for the watershed (from part a) and the percentage of the watershed area that is part of the permittee(s) jurisdiction (part b) to calculate a base WLA for this subwatershed.

B.2.2 Set Alternative subwatershed targets

- a. Permittee(s) may reallocate WLA within and between subwatershed based on factors including:
 - Population density within the pertinent watershed area;
 - Slope of the waterway;
 - Percent impervious surface and how that value was determined;
 - Stormwater treatment, installation of green infrastructure for the control or treatment of stormwater and stormwater pollution prevention and education programs within specific watersheds
- b. A proposal for an alternative subwatershed target must include the rationale for the factor(s) used

B.2.3 Ensure overall compliance with TMDL WLA allocation

The permittee(s) will provide calculations demonstrating the total WLA under the alternative proposed in (Part II) is consistent with the baseline calculated in (Part I) based on their total jurisdictional area. Permittee(s) will not be allowed to allocate more area within the watershed than is accorded to them under their jurisdictional area. For permittees that work cooperatively, WLA calculations may be combined and used where needed within the sub-watershed amongst the cooperating parties.

WLA calculations must be sent as part of the Notice of Intent to EPA via e-mail at R6_MS4Permits@epa.gov. These calculations must also be sent to:

Sarah Holcomb
 Industrial and Stormwater Team Leader
 NMED Surface Water Quality Bureau
 P.O. Box 5469,

Appendix C - Historic Properties Eligibility Procedures

MS4 operators must determine whether their MS4's storm water discharges, allowable non-storm water discharges, or construction of best management practices (BMPs) to control such discharges, have potential to affect a property that is either listed or eligible for listing on the National Register of Historic Places.

For existing dischargers who do not need to construct BMPs for permit coverage, a simple visual inspection may be sufficient to determine whether historic properties are affected. However, for MS4s which are new storm water dischargers and for existing MS4s which are planning to construct BMPs for permit eligibility, MS4 operators should conduct further inquiry to determine whether historic properties may be affected by the storm water discharge or BMPs to control the discharge. In such instances, MS4 operators should first determine whether there are any historic properties or places listed on the National Register or if any are eligible for listing on the register (e.g., they are "eligible for listing").

Due to the large number of entities seeking coverage under this permit and the limited number of personnel available to State and Tribal Historic Preservation Officers nationwide to respond to inquiries concerning the location of historic properties, EPA suggests that MS4 operators first access the "National Register of Historic Places" information listed on the National Park Service's web page (www.nps.gov/nr/). Addresses for State Historic Preservation Officers and Tribal Historic Preservation Officers are listed in Parts II and III of this appendix, respectively. In instances where a Tribe does not have a Tribal Historic Preservation Officer, MS4 operators should contact the appropriate Tribal government office when responding to this permit eligibility condition. MS4 operators may also contact city, county or other local historical societies for assistance, especially when determining if a place or property is eligible for listing on the register. Tribes that do not currently reside in an area may also have an interest in cultural properties in areas they formerly occupied. Tribal contact information is available at <http://www.epa.gov/region06/6dra/oejta/tribalaffairs/index.html>

The following three scenarios describe how MS4 operators can meet the permit eligibility criteria for protection of historic properties under this permit:

- (1) If historic properties are not identified in the path of an MS4's storm water and allowable non-storm water discharges or where construction activities are planned to install BMPs to control such discharges (e.g., diversion channels or retention ponds), then the MS4 operator has met the permit eligibility criteria under Part I.A.3.b.(i).
- (2) If historic properties are identified but it is determined that they will not be affected by the discharges or construction of BMPs to control the discharge, the MS4 operator has met the permit eligibility criteria under Part I.A.3.b.(ii).
- (3) If historic properties are identified in the path of an MS4's storm water and allowable non-storm water discharges or where construction activities are planned to install BMPs to control such discharges, and it is determined that there is the potential to adversely affect the property, the MS4 operator can still meet the permit eligibility criteria under Part I.A.3.b.(ii) if he/she obtains and complies with a written agreement with the appropriate State or Tribal Historic Preservation Officer which outlines measures the MS4 operator will follow to mitigate or prevent those adverse effects. The operator should notify EPA before exercising this option.

The contents of such a written agreement must be included in the MS4's Storm Water Management Program.

In situations where an agreement cannot be reached between an MS4 operator and the State or Tribal Historic Preservation Officer, MS4 operators should contact EPA for assistance.

The term "adverse effects" includes but is not limited to damage, deterioration, alteration or destruction of the historic property or place. EPA encourages MS4 operators to contact the appropriate State or Tribal Historic Preservation Officer as soon as possible in the event of a potential adverse effect to a historic property.

MS4 operators are reminded that they must comply with applicable State, Tribal and local laws concerning the protection of historic properties and places.

I. Internet Information on the National Register of Historic Places

An electronic listing of the "National Register of Historic Places," as maintained by the National Park Service on its National Register Information System (NRIS), can be accessed on the Internet at www.nps.gov/nr/.

II. State Historic Preservation Officers (SHPO)
SHPO List for areas covered by the permit:

NEW MEXICO

Historic Preservation Div, Office of Cultural Affairs
Bataan Memorial Building, 407 Galisteo Street, Suite 236
Santa Fe, NM 87501
505-827-6320 FAX: 505-827-6338

**III. Tribal Historic Preservation Officers
(THPO)**

In instances where a Tribe does not have a Tribal Historic Preservation Officer, please contact the appropriate Tribal government office when responding to this permit eligibility condition.

Tribal Historic Preservation Officers:

Mescalero Apache Tribe
P.O. Box 227
Mescalero, New Mexico 88340

Pueblo of Sandia Environment Department
Attn: Frank Chaves, Environment Director
481 Sandia Loop
Bernalillo, New Mexico 87004

Pueblo of Isleta
Department of Cultural and Historic Preservation
Attn: Dr. Henry Walt, THPO
P.O. Box 1270
Isleta NM 87022

Water Resources Division Manager
Pueblo of Santa Ana
2 Dove Road
Santa Ana Pueblo, New Mexico 87004

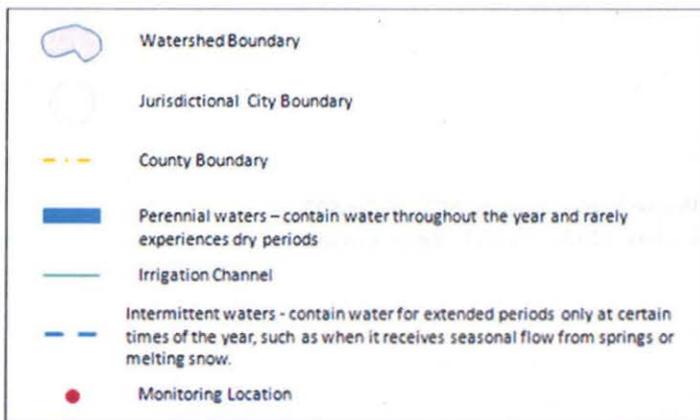
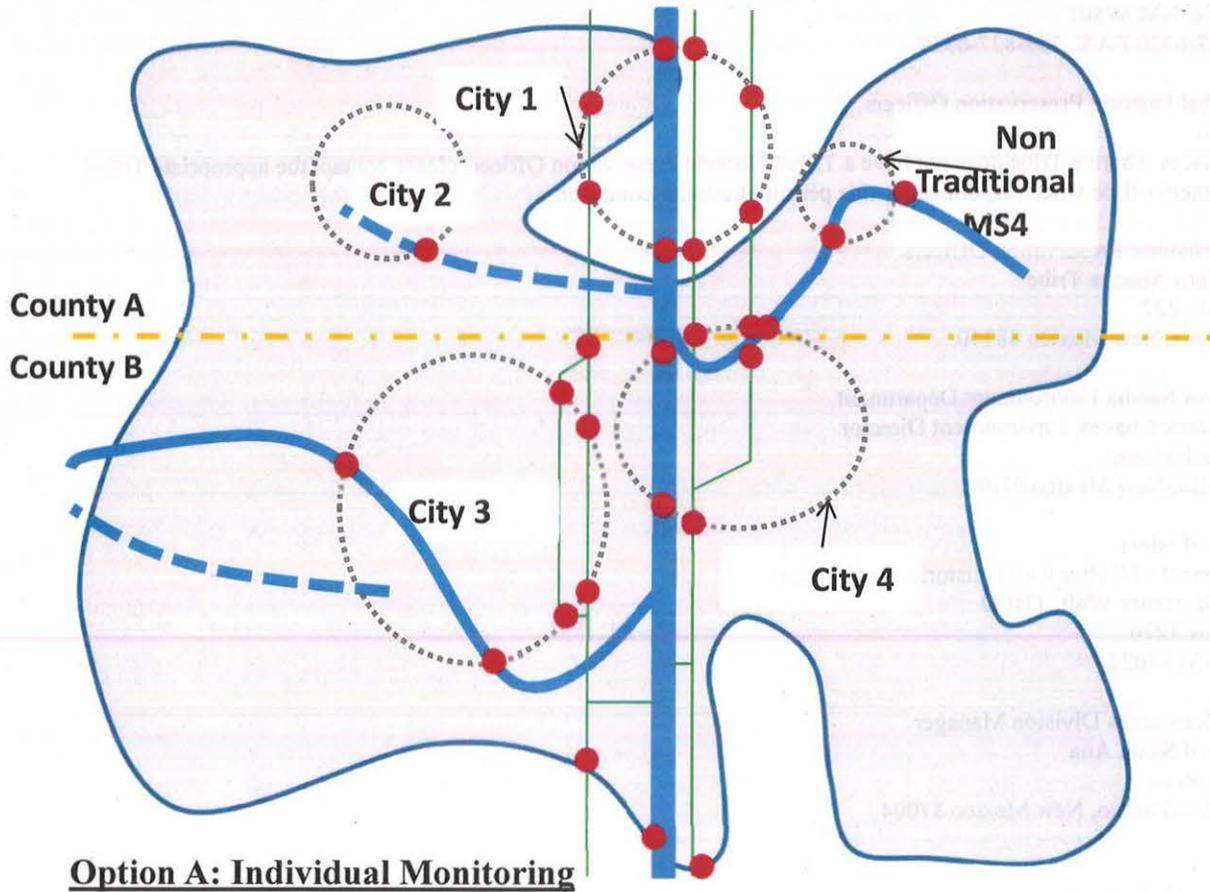
For more information:

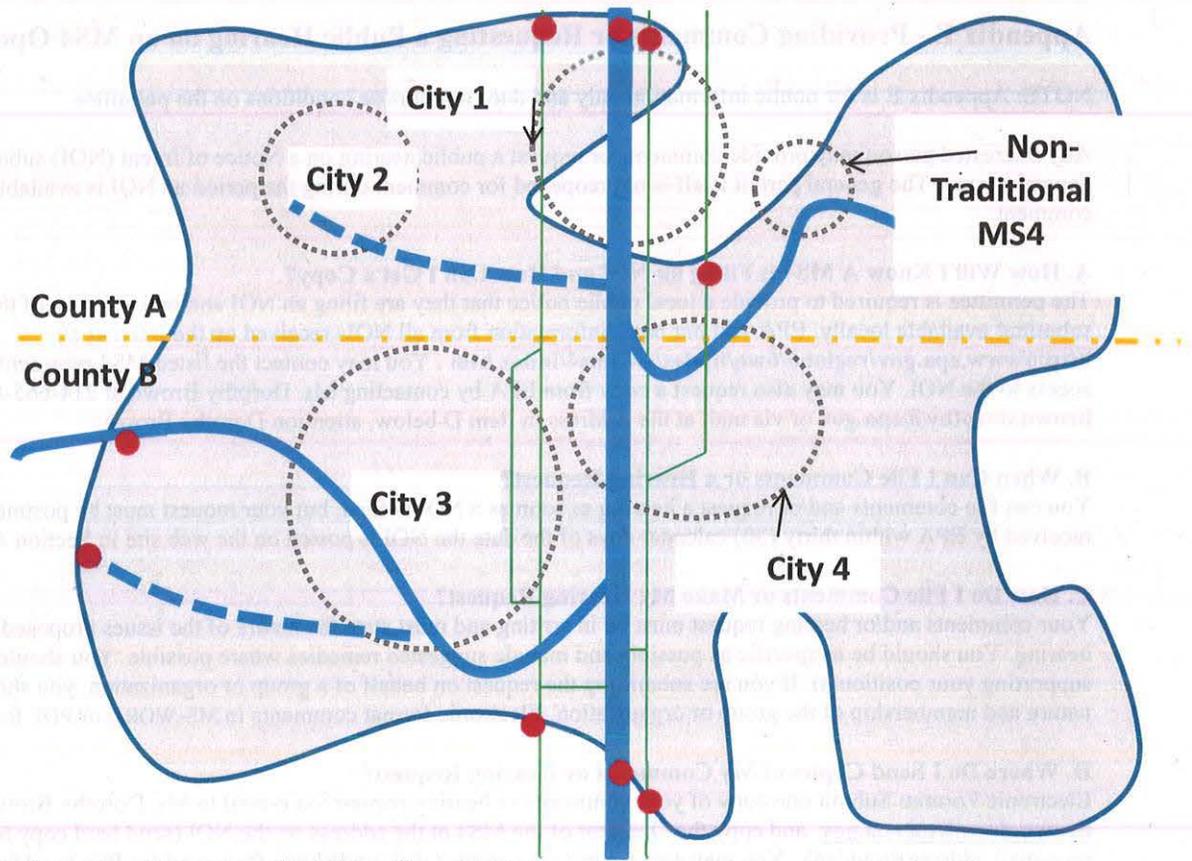
National Association of Tribal Historic
Preservation Officers
P.O. Box 19189
Washington, DC 20036-9189
Phone: (202) 628-8476
Fax: (202) 628-2241

IV. Advisory Council on Historic Preservation

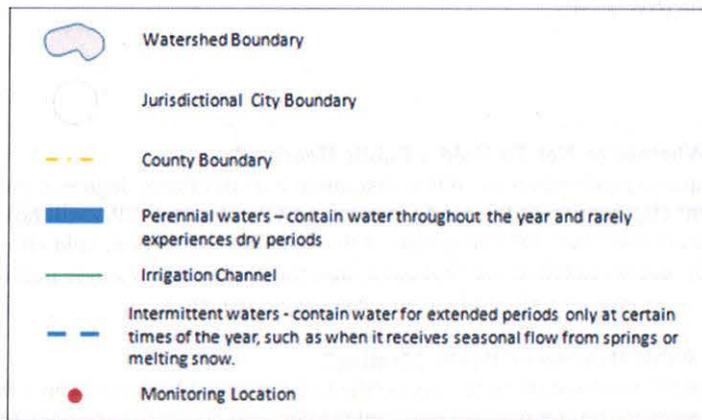
Advisory Council on Historic Preservation, 1100 Pennsylvania Avenue, NW., Suite 803,
Washington, DC 20004 Telephone: (202) 606-8503, Fax: (202) 606-8647/8672, E-mail:
achp@achp.gov

Appendix D - Suggested Initial Phase Sampling Location Concepts – Wet Weather Monitoring





Option B: Cooperative Monitoring



Appendix E - Providing Comments or Requesting a Public Hearing on an MS4 Operator's NOI

NOTE: Appendix E is for public information only and does not impose conditions on the permittee.

Any interested person may provide comments or request a public hearing on a Notice of Intent (NOI) submitted under this general permit. The general permit itself is not reopened for comment during the period an NOI is available for review and comment.

A. How Will I Know A MS4 is Filing an NOI and How Can I Get a Copy?

The permittee is required to provide a local public notice that they are filing an NOI and make a copy of the draft NOI submittal available locally. EPA will put basic information from all NOIs received on the Internet at: <http://www.epa.gov/region6/6wq/npdes/sw/sms4/index.htm> . You may contact the listed MS4 representative for local access to the NOI. You may also request a copy from EPA by contacting Ms. Dorothy Brown at 214-665-8141 or brown.dorothy@epa.gov or via mail at the Address in Item D below, attention Dorothy Brown.

B. When Can I File Comments or a Hearing Request?

You can file comments and/or request a hearing as soon as a NOI is filed, but your request must be postmarked or physically received by EPA within thirty (30) calendar days of the date the NOI is posted on the web site in Section A.

C. How Do I File Comments or Make My Hearing Request?

Your comments and/or hearing request must be in writing and must state the nature of the issues proposed to be raised in the hearing. You should be as specific as possible and include suggested remedies where possible. You should include any data supporting your position(s). If you are submitting the request on behalf of a group or organization, you should describe the nature and membership of the group or organization. Electronic format comments in MS-WORD or PDF format are preferred.

D. Where Do I Send Copies of My Comments or Hearing Request?

Electronic Format: Submit one copy of your comments or hearing request via e-mail to Ms. Dorothy Brown at brown.dorothy@epa.gov and copy the Operator of the MS4 at the address on the NOI (send hard copy to MS4 Operator if no e-mail address provided). You may also submit via compact disk or diskette formatted for PCs to addresses for hard copy below. (Hard Copy: You must send an original and one copy of your comments or hearing request to EPA at the address below and a copy to the Operator of the MS4 at the address provided on the NOI)

U.S. EPA Region 6
Water Quality Protection Division (6WQ-NP)
Attn: Dorothy Brown
1445 Ross Ave., Suite 1200
Dallas, TX 75202

E. How Will EPA Determine Whether or Not To Hold a Public Hearing?

EPA will evaluate all hearing requests received on an NOI to determine if a significant degree of public interest exists and whether issues raised may warrant clarification of the MS4 Operator's NOI submittal. EPA will hold a public hearing if a significant amount of public interest is evident. EPA may also, at the Agency's discretion, hold either a public hearing or an informal public meeting to clarify issues related to the NOI submittal. EPA may hold a single public hearing or public meeting covering more than one MS4 (e.g., for all MS4s in an Urbanized Area, etc.).

F. How Will EPA Announce a Public Hearing or Public Meeting?

EPA will provide public notice of the time and place for any public hearing or public meeting in a major newspaper with local distribution and via the Internet at <http://www.epa.gov/region6/6wq/npdes/sw/sms4/index.htm>.

G. What Will EPA Do With Comments on an NOI?

EPA will take all comments made directly or in the course of a public hearing or public meeting into consideration in determining whether or not the MS4 that submitted the NOI is appropriately covered under the general permit. The MS4 operator will have the opportunity to provide input on issues raised. The Director may require the MS4 operator to supplement or amend the NOI submittal in order to be authorized under the general permit or may direct the MS4 Operator to submit an individual permit application. A summary of issues raised and EPA's responses will be made available online at <http://www.epa.gov/region6/6wq/npdes/sw/sms4/index.htm>. A hard copy may also be requested by contacting Ms. Dorothy Brown (see paragraph D)

Appendix F - Minimum Quantification Levels (MQL's)

The following Minimum Quantification Levels (MQL's) are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
METALS, RADIOACTIVITY, CYANIDE and CHLORINE			
Aluminum	2.5	Molybdenum	10
Antimony	60	Nickel	0.5
Arsenic	0.5	Selenium	5
Barium	100	Silver	0.5
Beryllium	0.5	Thallium	0.5
Boron	100	Uranium	0.1
Cadmium	1	Vanadium	50
Chromium	10	Zinc	20
Cobalt	50	Cyanide	10
Copper	0.5	Cyanide, weak acid dissociable	10
Lead	0.5	Total Residual Chlorine	33
Mercury (*)	0.0005 0.005		
DIOXIN			
2,3,7,8-TCDD	0.00001		
VOLATILE COMPOUNDS			
Acrolein	50	1,3-Dichloropropylene	10
Acrylonitrile	20	Ethylbenzene	10
Benzene	10	Methyl Bromide	50
Bromoform	10	Methylene Chloride	20
Carbon Tetrachloride	2	1,1,2,2-Tetrachloroethane	10
Chlorobenzene	10	Tetrachloroethylene	10
Chlorodibromomethane	10	Toluene	10
Chloroform	50	1,2-trans-Dichloroethylene	10
Dichlorobromomethane	10	1,1,2-Trichloroethane	10
1,2-Dichloroethane	10	Trichloroethylene	10
1,1-Dichloroethylene	10	Vinyl Chloride	10
1,2-Dichloropropane	10		
ACID COMPOUNDS			
2-Chlorophenol	10	2,4-Dinitrophenol	50
2,4-Dichlorophenol	10	Pentachlorophenol	5
2,4-Dimethylphenol	10	Phenol	10
4,6-Dinitro-o-Cresol	50	2,4,6-Trichlorophenol	10

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
BASE/NEUTRAL			
Acenaphthene	10	Dimethyl Phthalate	10
Anthracene	10	Di-n-Butyl Phthalate	10
Benzdine	50	2,4-Dinitrotoluene	10
Benzo(a)anthracene	5	1,2-Diphenylhydrazine	20
Benzo(a)pyrene	5	Fluoranthene	10
3,4-Benzofluoranthene	10	Fluorene	10
Benzo(k)fluoranthene	5	Hexachlorobenzene	5
Bis(2-chloroethyl)Ether	10	Hexachlorobutadiene	10
Bis(2-chloroisopropyl)Ether	10	Hexachlorocyclopentadiene	10
Bis(2-ethylhexyl)Phthalate	10	Hexachloroethane	20
Butyl Benzyl Phthalate	10	Indeno(1,2,3-cd)Pyrene	5
2-Chloronaphthalene	10	Isophorone	10
Chrysene	5	Nitrobenzene	10
Dibenzo(a,h)anthracene	5	n-Nitrosodimethylamine	50
1,2-Dichlorobenzene	10	n-Nitrosodi-n-Propylamine	20
1,3-Dichlorobenzene	10	n-Nitrosodiphenylamine	20
1,4-Dichlorobenzene	10	Pyrene	10
3,3'-Dichlorobenzidine	5	1,2,4-Trichlorobenzene	10
Diethyl Phthalate	10		
PESTICIDES AND PCBS			
Aldrin	0.01	Beta-Endosulfan	0.02
Alpha-BHC	0.05	Endosulfan sulfate	0.02
Beta-BHC	0.05	Endrin	0.02
Gamma-BHC	0.05	Endrin Aldehyde	0.1
Chlordane	0.2	Heptachlor	0.01
4,4'-DDT and derivatives	0.02	Heptachlor Epoxide	0.01
Dieldrin	0.02	PCBs **	0.2
Alpha-Endosulfan	0.01	Toxaphene	0.3

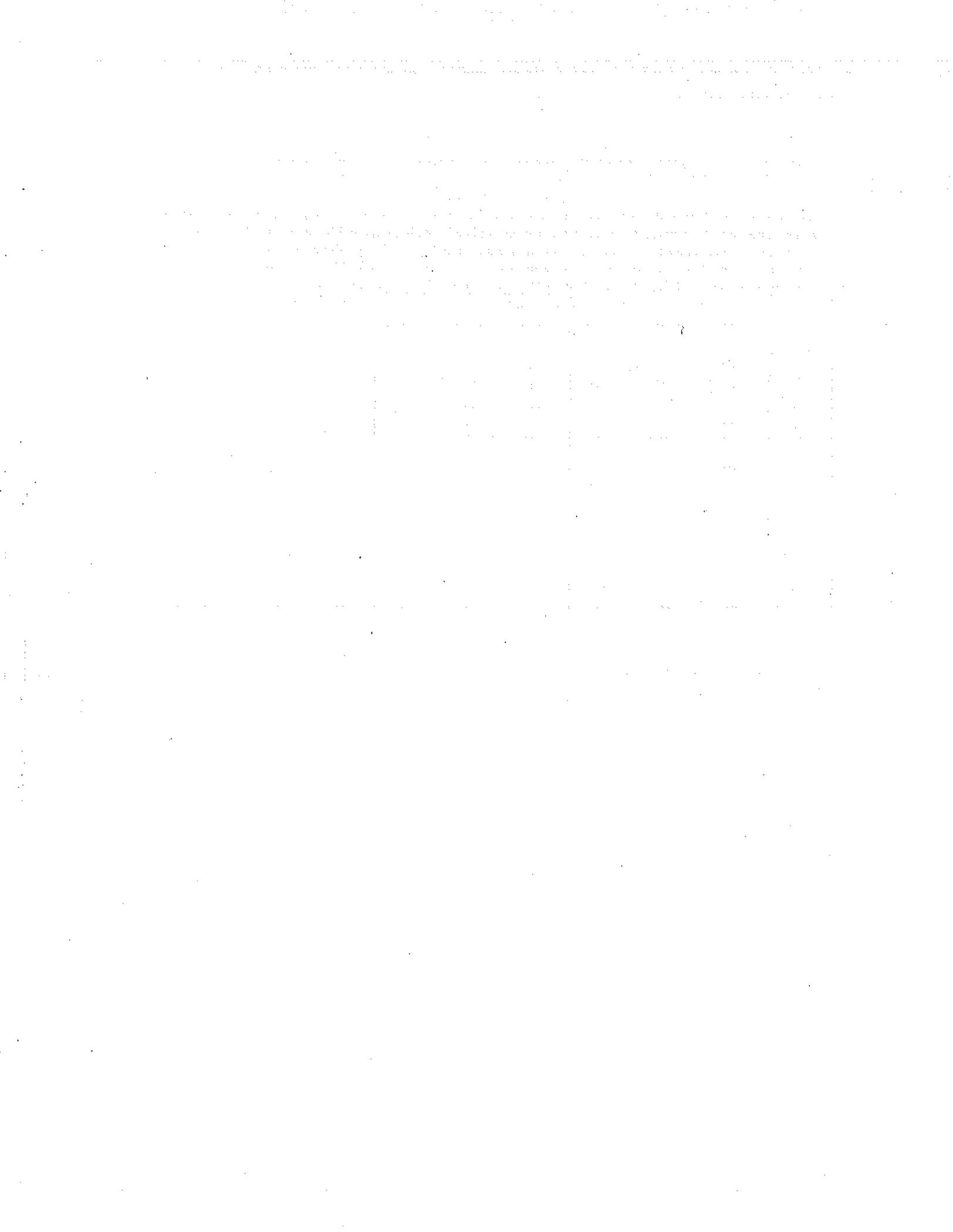
(MQL's Revised November 1, 2007)

- (*) Default MQL for Mercury is 0.005 unless Part I of your permit requires the more sensitive Method 1631 (Oxidation / Purge and Trap / Cold vapor Atomic Fluorescence Spectrometry), then the MQL shall be 0.0005.
- (**) EPA Method 1668 should be utilized when PCB water column monitoring is conducted to determine compliance with permit requirements. Either the Arochlor test (EPA Method 8082) or USGS test method (8093) may be utilized for purposes of sediment sampling as part of a screening program, but must use EPA Method 1668 (latest revision) for confirmation and determination of specific PCB levels at that location.

Appendix G – Oxygen Saturation and Dissolved Oxygen Concentrations North Diversion Channel Area

Concentrations of dissolved oxygen in water at various atmospheric pressures and temperatures with 100 percent oxygen saturation, 54.3 percent oxygen saturation (associated with hypoxia and harassment of silvery minnows), and 8.7 percent oxygen saturation (associated with anoxia and lethality of silvery minnows) at the North Diversion Channel (NDC) (based on USGS DO website <<http://water.usgs.gov/software/DOTABLES/>> for pressures between 628 to 648 millimeters of mercury (Hg)). Source: Biological Consultation Cons. #22420-2011-F-0024-R001

Water temp. (°C)	100% Oxygen Saturation at NDC			54.3% saturation = Harassmen			8.7% saturation = 50% Lethality		
	628mmHg	638mmHg	648mmHg	628mmHg	638mmHg	648mmHg	628mmHg	638mmHg	648mmHg
0	12.1	12.3	12.5	6.6	6.7	6.8	1.1	1.1	1.1
1	11.7	11.9	12.1	6.4	6.5	6.6	1.0	1.0	1.1
2	11.4	11.6	11.8	6.2	6.3	6.4	1.0	1.0	1.0
3	11.1	11.3	11.5	6.0	6.1	6.2	1.0	1.0	1.0
4	10.8	11	11.2	5.9	6.0	6.1	0.9	1.0	1.0
5	10.5	10.7	10.9	5.7	5.8	5.9	0.9	0.9	0.9
6	10.3	10.4	10.6	5.6	5.8	5.8	0.9	0.9	0.9
7	10	10.2	10.3	5.4	5.5	5.6	0.9	0.9	0.9
8	9.8	9.9	10.1	5.3	5.4	5.5	0.9	0.9	0.9
8	9.5	9.7	9.6	5.2	5.3	5.3	0.8	0.8	0.9
11	9.3	9.5	9.6	5.0	5.2	5.2	0.8	0.8	0.8
11	9.1	9.2	9.4	4.9	5.0	5.1	0.8	0.8	0.8
12	8.9	9	9.2	4.8	4.9	5.0	0.8	0.8	0.8
13	8.7	8.8	9	4.7	4.8	4.9	0.8	0.8	0.8
14	8.5	8.6	8.8	4.8	4.7	4.8	0.7	0.7	0.8
15	8.3	8.4	8.8	4.5	4.6	4.7	0.7	0.7	0.7
16	8.1	8.3	8.4	4.4	4.5	4.6	0.7	0.7	0.7
17	8	8.1	8.2	4.3	4.4	4.5	0.7	0.7	0.7
16	7.8	7.9	8	4.2	4.3	4.3	0.7	0.7	0.7
19	7.6	7.8	7.9	4.1	4.2	4.3	0.7	0.7	0.7
20	7.5	7.6	7.7	4.1	4.1	4.2	0.7	0.7	0.7
21	7.3	7.4	7.6	4.0	4.0	4.1	0.6	0.6	0.7
22	7.2	7.3	7.4	3.9	4.0	4.0	0.6	0.6	0.6
23	7	7.2	7.3	3.8	3.9	4.0	0.6	0.6	0.6
24	6.9	7	7.1	3.7	3.8	3.9	0.6	0.6	0.6
25	6.8	6.9	7	3.7	3.7	3.6	0.6	0.6	0.6
26	6.7	6.8	6.9	3.6	3.7	3.7	0.6	0.6	0.6
27	6.5	6.6	6.8	3.5	3.6	3.7	0.6	0.6	0.8
26	6.4	6.5	6.6	3.5	3.5	3.6	0.6	0.8	0.8
29	6.3	6.4	6.5	3.4	3.5	3.5	0.5	0.6	0.8
28	6.2	6.3	6.4	3.4	3.4	3.5	0.5	0.5	0.8
31	6.1	6.2	6.3	3.3	3.4	3.4	0.5	0.5	0.8
32	6	6.1	6.2	3.3	3.3	3.4	0.5	0.5	0.5
33	5.9	6	6.1	3.2	3.3	3.3	0.5	0.5	0.5
34	5.8	5.9	6	3.1	3.2	3.3	0.5	0.5	0.5
	5.7	5.6	5.9	3.1	3.1	3.2	0.5	0.5	0.5



ATTACHMENT 42

**United States Environmental Protection Agency (EPA)
National Pollutant Discharge Elimination System (NPDES)**

**GENERAL PERMITS FOR STORMWATER DISCHARGES FROM
SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
IN MASSACHUSETTS**

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the Clean Water Act (CWA), as amended (33 U.S.C. §1251 *et seq.*), and the Massachusetts Clean Waters Act, as amended (M.G.L. Chap.21 §§ 26-53), any operator of a small municipal separate storm sewer system whose system:

- Is located in the areas described in part 1.1;
- Is eligible for coverage under part 1.2 and part 1.9; and
- Submits a complete and accurate Notice of Intent in accordance with part 1.7 of this permit and EPA issues a written authorization

is authorized to discharge in accordance with the conditions and the requirements set forth herein.

The following appendices are also included as part of these permits:

- Appendix A – Definitions, Abbreviations, and Acronyms;
- Appendix B – Standard permit conditions applicable to all authorized discharges;
- Appendix C – Endangered Species Act Eligibility Guidance;
- Appendix D – National Historic Preservation Act Eligibility Guidance;
- Appendix E – Information required for the Notice of Intent (NOI);
- Appendix F – Requirements for MA Small MS4s Subject to Approved TMDLs;
- Appendix G – Impaired Waters Monitoring Parameter Requirements;
- Appendix H – Requirements related to discharges to certain water quality limited waterbodies;

These permits become effective on **July 1, 2017**.

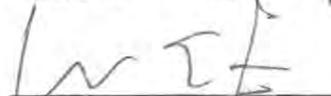
These permits and the authorization to discharge expire at midnight, **June 30, 2022**.

Signed this 4th day of April, 2016



Ken Moraff, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

Signed this 4th day of April 2016



Douglas E. Fine
Assistant Commissioner for Water
Resources
Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

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1.0. Introduction

This document consists of three (3) general permits listed in part 1.1. Each general permit is applicable to a particular type of municipal system within Massachusetts. Many of the permit terms and conditions are applicable across all regulated entities, and therefore are presented just once in parts 1-2, part 4, and Appendices A through E. Other conditions are applicable to a particular set of authorized entities; these terms and conditions are included in parts 3, and 5 and Appendices F through H. Throughout the permit, the terms “this permit” or “the permit” will refer to the three general permits.

1.1. Areas of Coverage

This permit covers small municipal separate storm sewer systems (MS4s) located in the Commonwealth of Massachusetts:

- Traditional Cities and Towns (NPDES Permit No. MAR041000)
- State, federal, county and other publicly owned properties (Non-traditional) (MAR042000)
- State transportation agencies (except for MassDOT- Highway Division) (MAR043000)

1.2. Eligibility

The MS4 shall meet the eligibility provisions described in part 1.2.1 and part 1.9 to be eligible for authorization under this permit.

1.2.1. Small MS4s Covered

This permit authorizes the discharge of stormwater from small MS4s as defined at 40 CFR § 122.26(b) (16). This includes MS4s described in 40 CFR §122.32(a) (1) and (a) (2). An MS4 is eligible for coverage under this permit if it is:

- A small MS4 within the Commonwealth of Massachusetts;
- Not a large or medium MS4 as defined in 40 CFR §§122.26(b)(4) or (7);
- Located either fully or partially within an urbanized area as determined by the latest Decennial Census by the Bureau of Census as of the effective date of this permit (the 2010 Census); or
- Located in a geographic area designated by EPA as requiring a permit.

If the small MS4 is not located entirely within an urbanized area, only the portion of the MS4 that is located within the urbanized area is regulated under 40 CFR §122.32(a) (1).

A small municipal separate storm sewer system means all separate storm sewers that are:

- Owned or operated by the United States, a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.
- Not defined as large or medium municipal separate storm sewer systems pursuant to 40 CFR § 122.26(b) (4) and (b) (7) or designated under 40 CFR § 122.26(a) (1) (v).
- This term includes systems similar to separate storm sewer systems in municipalities such as systems at military bases, large hospitals or prison complexes, and highways

and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

1.3. Limitations on Coverage

This permit does not authorize the following:

- a. Stormwater discharges mixed with sources of non-stormwater unless such non-stormwater discharges are:
 - Authorized under a separate NPDES permit; or
 - A non-stormwater discharge as listed in part 1.4.
- b. Stormwater discharges associated with industrial activity as defined in 40 CFR §122.26 (b) (14) (i)-(ix) and (xi).
- c. Stormwater discharges associated with construction activity as defined in 40 CFR §122.26(b) (14) (x) or (b) (15).
- d. Stormwater discharges currently authorized under another NPDES permit, including discharges covered under other regionally issued general permits.
- e. Stormwater discharges or discharge related activities that are likely to adversely affect any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA. The permittee shall follow the procedures detailed in Appendix C to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.
- f. Stormwater discharges whose direct or indirect impacts do not prevent or minimize adverse effects on any Essential Fish Habitat.
- g. Stormwater discharges, or implementation of a stormwater management program, which adversely affects properties listed or eligible to be listed on the National Register of Historic Places. The permittee shall follow the procedures detailed in Appendix D to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.
- h. Stormwater discharges prohibited under 40 CFR § 122.4.
- i. Stormwater discharges to the subsurface subject to state Underground Injection Control (UIC) regulations. Although the permit includes provisions related to infiltration and groundwater recharge, structural controls that dispose of stormwater into the ground may be subject to UIC regulation requirements. Authorization for such discharges shall be obtained from Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, Underground Injection Control, One Winter Street, Boston, MA 02108 – phone 617-292-5859.
- j. Any non-traditional MS4 facility that is a “new discharger” as defined in part 5.1.4. and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or (Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants.

1.4. Non-Stormwater Discharges

The following categories of non-stormwater discharges are allowed under this permit *unless* the permittee, EPA, or the MassDEP identifies any category or individual discharge of non-stormwater discharge in part 1.4.a-r as a significant contributor of pollutants to the MS4, then that category or individual discharge is not allowed under part 1.4, but rather shall be deemed an “illicit discharge” under part 2.3.4.1, and the permittee shall address that category or individual discharge as part of the Illicit Discharge Detection and Elimination (IDDE) Program described in part 2.3.4 of this permit.

- a. Water line flushing
- b. Landscape irrigation
- c. Diverted stream flows
- d. Rising ground water
- e. Uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20))
- f. Uncontaminated pumped ground water
- g. Discharge from potable water sources
- h. Foundation drains
- i. Air conditioning condensation
- j. Irrigation water, springs
- k. Water from crawl space pumps
- l. Footing drains
- m. Lawn watering
- n. Individual resident car washing
- o. Flows from riparian habitats and wetlands
- p. De-chlorinated swimming pool discharges
- q. Street wash waters
- r. Residential building wash waters without detergents

Discharges or flows from firefighting activities are allowed under this permit need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

1.5. Permit Compliance

Non-compliance with any of the requirements of this permit constitutes a violation of the permit and the CWA and may be grounds for an enforcement action and may result in the imposition of injunctive relief and/or penalties.

1.6. Continuation of this Permit

If this permit is not reissued prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and remain in force and effect for discharges that were authorized prior to expiration. If a small MS4 was granted permit authorization prior to the expiration date of this permit, it will automatically remain authorized by this permit until the earliest of:

- Authorization under a reissued general permit following timely and appropriate submittal of a complete and accurate NOI requesting authorization to discharge under the reissued permit; or
- Issuance or denial of an individual permit for the MS4’s discharges; or
- Authorization or denial under an alternative general permit.

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If the MS4 operator does not submit a timely, appropriate, complete, and accurate NOI requesting authorization to discharge under the reissued permit or a timely request for authorization under an individual or alternative general permit, authorization under this permit will terminate on the due date for the NOI under the reissued permit unless otherwise specified in the reissued permit.

1.7. Obtaining Authorization to Discharge

1.7.1. How to Obtain Authorization to Discharge

To obtain authorization under this permit, a small MS4 shall:

- Be located in the areas listed in part 1.1 of this permit;
- Meet the eligibility requirements in part 1.2 and part 1.9;
- Submit a complete and accurate Notice of Intent (NOI) in accordance with the requirements of part 1.7.2; and
- EPA issues a written authorization.

1.7.2. Notice of Intent

- a. Operators of Small MS4s seeking authorization to discharge under the terms and conditions of this permit shall submit a Notice of Intent that contains the information identified in Appendix E. This includes operators of small MS4s that were previously authorized under the May 1, 2003 small MS4 general permit (MS4-2003 permit).
- b. The NOI shall be signed by an appropriate official (see Appendix B, Subparagraph B.11, Standard Conditions).
- c. The NOI shall contain the following certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print the name and title of the official, followed by signature and date.

- d. The NOI shall be submitted within 90 days of the effective date of the permit. If EPA notifies an MS4 that it is designated under 40 CFR § 122.32(a) (2) or (b), the NOI shall be submitted within 180 days of receipt of notice unless granted a longer period of time by EPA.

1.7.3. Submission of Notice of Intent

- a. All small MS4s shall submit a complete and accurate Notice of Intent (suggested form in Appendix E) to EPA-Region 1 at the following address:

United States Environmental Protection Agency
Stormwater and Construction Permits Section (OEP06-1)
Five Post Office Square, Suite 100
Boston, MA 02109

Or submitted electronically to EPA at the following email address: stormwater.reports@epa.gov

- b. All small MS4s shall also submit a copy of the NOI to the MassDEP at the following address:

Massachusetts Department of Environmental Protection
One Winter Street -5th Floor
Boston, Massachusetts 02108
ATTN: Frederick Civian, Stormwater Coordinator

- c. Late notification: A small MS4 is not prohibited from submitting a NOI after the dates provided in part 1.7.2.d. However, if a late NOI is submitted, authorization is only for discharges that occur after permit authorization is granted. EPA and MassDEP reserve the right to take enforcement actions for any unpermitted discharges. All NOIs submitted after December 21, 2020 must be submitted electronically.

1.7.4. Public Notice of NOI and Effective Date of Coverage

- a. EPA will provide a public notice and opportunity for comment on the contents of the submitted NOIs. The public comment period will be a minimum of 30 calendar days.
- b. Based on a review of a small MS4's NOI or other information, EPA may grant authorization, extend the public comment period, or deny authorization under this permit and require submission of an application for an individual or alternative NPDES permit. (See part 1.8) A small MS4 will be authorized to discharge under the terms and conditions of this permit upon receipt of notice of authorization from EPA.
- c. Permittees whose authorization to discharge under the MS4-2003 permit, which expired on May 1, 2008, has been administratively continued in accordance with the Administrative Procedure Act (5 U.S.C. § 558(c) and 40 CFR § 122.6, who wish to obtain coverage under this permit, must submit a new NOI requesting permit coverage in accordance with the requirements of part 1.7 of this permit to EPA within 90 days after the effective date of this permit. Permittees whose authorization to discharge under the expired MS4-2003 permit was administratively continued, who fail to submit a timely, complete and accurate NOI or an application for an individual NPDES permit within 90 after the effective date of this permit will be considered to be discharging without a permit (see 40 CFR § 122.28(b)(3)(iii)).

1.8. Individual Permits and Alternative General Permits

- a. EPA may require a small MS4 to apply for and obtain authorization under either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition EPA in accordance with the provisions of 40 CFR § 122.26(f) to require a small MS4 to apply for and/or obtain authorization under either an individual NPDES permit or an alternative NPDES general permit. If EPA requires a small MS4 to apply for an individual or alternative NPDES permit, EPA will notify the small MS4 in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and will provide application information and an application deadline. If a small MS4 is authorized under the MS4-2003 permit or this permit and fails to submit an individual NPDES or an alternative general permit NPDES permit application as required by EPA, then the authorization under the MS4-2003 permit or this permit to the small MS4 is automatically terminated at the end of the date specified by EPA as the deadline

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for application submittal. EPA reserves the right to take enforcement action for any unpermitted discharge.

- b. A small MS4 may request to be excluded from this general permit by applying for an individual permit or authorization under an alternative general permit. In such a case, a small MS4 shall submit an individual permit application in accordance with the requirements of 40 CFR § 122.33(b) (2) (i) or § 122.33(b) (2) (ii), with reasons supporting the request, to EPA at the address listed in part 1.7.3 of this permit. The request may be granted by issuance of an individual permit or authorization under an alternative general permit if EPA determines that the reasons stated by the small MS4 are adequate to support the request. (See 40 CFR § 122.28(b) (3)).
- c. When an individual NPDES permit is issued, or a small MS4 is authorized to discharge under an alternative NPDES general permit, authorization under this permit automatically terminates on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

1.9. Special Eligibility Determinations

1.9.1. Documentation Regarding Endangered Species

The small MS4 shall certify eligibility regarding endangered species in the NOI required by part 1.7.2. The Stormwater Management Program (SWMP) shall include documentation supporting the permittee's eligibility determination with regard to federal Endangered and Threatened Species and Critical Habitat Protection, including:

- Results of the Appendix C U.S. Fish and Wildlife Service endangered species screening determination; and
- If applicable, a description of the measures the small MS4 shall implement to protect federally listed endangered or threatened species, or critical habitat, including any conditions imposed by the U.S. Fish and Wildlife Service. If a permittee fails to document and implement such measures, the permittee's discharges are ineligible for coverage under this permit.

1.9.2. Documentation Regarding Historic Properties

The small MS4 shall certify eligibility regarding historic properties on the NOI required by part 1.7.2. The SWMP shall include documentation supporting the small MS4's eligibility determination with regard to Historic Properties Preservation, including:

- Information on whether the permittee's stormwater discharges, allowable non-stormwater discharges, or stormwater discharge-related activities would have an effect on a property that is listed or eligible for listing on the National Register of Historic Properties (NRHP);
- Where such effects may occur, any documents received by the permittee or any written agreements the permittee has made with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other Tribal representative to mitigate those effects;
- Results of the Appendix D historic property screening investigations; and
- If applicable, a description of the measures the permittee shall implement to avoid or minimize adverse impacts on places listed, or eligible for listing, on the NRHP, including any conditions imposed by the SHPO or THPO. If the permittee fails to

document and implement such measures, those discharges are ineligible for coverage under this permit.

1.10. Stormwater Management Program (SWMP)

- a. The permittee shall develop and implement a written (hardcopy or electronic) SWMP. The SWMP shall be signed in accordance with Appendix B, Subsection 11, including the date of signature. A signature and date is required for initial program preparation and for any significant revision to the program, which shall be in writing. The written SWMP shall be completed within one (1) year of the effective date of the permit.

The SWMP is the document used by the permittee to describe and detail the activities and measures that will be implemented to meet the terms and conditions of the permit. The SWMP shall accurately describe the permittees plans and activities. The document should be updated and/or modified during the permit term as the permittee's activities are modified, changed or updated to meet permit conditions during the permit term.

- b. Permittees authorized by the MS4-2003 permit shall modify or update their existing Best Management Practices (BMPs) and measurable goals to meet the terms and conditions of part 2.3 of this permit within one (1) year of the effective date of the permit. These modifications and updates shall be reflected in the written (hardcopy or electronic) SWMP. Permittees authorized by the MS4-2003 permit shall continue to implement their existing SWMP until the program has been updated.

1.10.1. Stormwater Management Program Availability

- a. The permittee shall retain a copy of the current SWMP required by this permit at the office or facility of the person listed as the program contact on the submitted Notice of Intent (NOI). The SWMP shall be immediately available to representatives from EPA, MassDEP, U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) at the time of an onsite inspection or upon request.
- b. The permittee shall make the SWMP available to the public during normal business hours. The permittee shall also post the SWMP online¹ if the permittee has a website on which to post the SWMP.

1.10.2. Contents and Timelines of the Stormwater Management Program for 2003 permittees

The following information must be included in the SWMP within one (1) year of the permit effective date and updated annually thereafter, as necessary:

- Identification of names and titles of people responsible for program implementation. If a position is currently unfilled, list the title of the position and modify the SWMP with the name once the position is filled;
- Documentation of compliance with part 1.9.1;

¹ Should a permittee not wish to post mapping information included in the SWMP (see part 1.10.2) on their website for public safety reasons, they must state the reason either with or within the online SWMP and provide how the MS4 mapping information can be obtained. The permittee must retain the entire SWMP, including all completed mapping, at a location where it can be made available to the public during normal business hours.

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- Documentation of compliance with part 1.9.2;
- Documentation of authorization of all new or increased discharges granted by MassDEP in compliance with part 2.1.2; part
- Listing of all discharges identified pursuant to part 2.1.1 and description of response;
- Description of practices to achieve compliance with part 2.3 (MEP requirements) identified in the permittee's NOI and any updates to those BMPs within the first year;
For each permit condition in part 2.3 identify:
 - The person(s) or department responsible for the measure;
 - The BMPs for the control measure or permit requirement;
 - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;
- Sanitary Sewer Overflow (SSO) inventory including all of the information required in part 2.3.4.4.b;
- Written IDDE Program pursuant to part 2.3.4.6;
- Written procedures for site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5;
- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770.
- Description of activities to achieve compliance with part 3.0;
- Annual program evaluation (part 4.1). Update annually and maintain copies.

The following information must be included in the SWMP within two (2) years of the permit effective date and updated annually thereafter, as necessary:

- Listing of all receiving waterbody segments, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and number of outfalls from the MS4 that discharge to each waterbody. In addition to the receiving water, the permittee shall document in the SWMP all surface public drinking water sources that may be impacted by MS4 discharges;
- Listing of all interconnected MS4s and other separate storm sewer systems receiving a discharge from the permitted MS4, the receiving waterbody segment(s) ultimately receiving the discharge, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and the number of interconnections;
- Written procedures to require submission of as-built drawings and ensure long term operation and maintenance in accordance with part 2.3.6.a.iii;
- The map of the separate storm sewer system required by part 2.3.4.5.

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Report(s) assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover.

The following information must be included in the SWMP concurrent with the applicable deadlines in Appendix F and H and updated annually thereafter, as necessary:

- Description of practices to achieve compliance with part 2.2.1 (TMDL requirements) including:
 - The person(s) or department responsible for the measure;
 - The BMPs for the control measure or permit requirement;
 - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment.
- Description of practices to achieve compliance with part 2.2.2 (discharges to certain water quality limited waters subject to additional requirements) including:
 - The person(s) or department responsible for the measure;
 - The BMPs for the control measure or permit requirement;
 - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment;

Description of any other practices to achieve compliance with part 2.1 (water quality based requirements);1.10.3. Contents and Timelines of the Stormwater Management Program for New Permittees

a. Permittees seeking authorization for the first time shall meet all deadlines contained in this permit except the following:

- Timelines for public education requirements in part 2.3.2.c shall be extended by one (1) year and need to include one (1) message to each audience over the permit term;
- The ordinances, by-laws, or other regulatory mechanisms required by parts 2.3.4, 2.3.5 and 2.3.6 shall be completed as soon as possible, but no later than three (3) years from the permit effective date; and
- All other deadlines in part 2.3.4 shall be extended by three (3) years.
- partAll other deadlines in part 2.3.5, 2.3.6 and 2.3.7 shall be extended by two (2) years.
- partpartpartAll deadlines for discharges to water quality limited waters without a TMDL under part 2.2.2 shall be extended by two (2) years.

b. Contents of the Stormwater Management Program for New Permittees

The following information must be included in the SWMP within one (1) year of the permit effective date and updated annually thereafter, as necessary:

- Identification of names and titles of people responsible for program implementation. If a position is currently unfilled, list the title of the position and modify the SWMP with the name once the position is filled;
- Documentation of compliance with part 1.9.1;
- Documentation of compliance with part 1.9.2;
- Documentation of authorization of all new or increased discharges granted by MassDEP in compliance with part 2.1.2;
- Listing of all discharges identified pursuant to part 2.1.1 and description of response;
- Description of practices to achieve compliance with part 2.3 (MEP requirements)

identified in the permittee's NOI and any updates to those BMPs within the first year;

For each permit condition in part 2.3 identify:

- The person(s) or department responsible for the measure;
 - The BMPs for the control measure or permit requirement;
 - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;
- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770. Description of activities to achieve compliance with part 3.0;
 - Annual program evaluation (part 4.1). Update annually and maintain copies.

The following information must be included in the SWMP within three (3) years of the permit effective date and updated annually thereafter, as necessary:

- Written procedures for site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5;
- Written operation and maintenance procedures for municipal activities in part 2.3.7.a.ii;
- Written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4 in accordance with part 2.3.7.a.iii.1;
- Written procedures to require submission of as-built drawings and ensure long term operation and maintenance in accordance with part 2.3.6.a.iii;

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Outfall and interconnection inventory;
- Sanitary Sewer Overflow (SSO) inventory including all of the information required in part 2.3.4.4.b;
- Written IDDE Program pursuant to part 2.3.4.6.

The following information must be included in the SWMP within four (5) years of the permit effective date and updated annually thereafter, as necessary:

- Phase 1 of the map of the separate storm sewer system required by part 2.3.4.5;
- Listing of all receiving waterbody segments, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and number of outfalls from the MS4 that discharge to each waterbody. In addition to the receiving water, the permittee shall document in the SWMP all surface public drinking water sources that may be impacted by MS4 discharges;
- Listing of all interconnected MS4s and other separate storm sewer systems receiving a discharge from the permitted MS4, the receiving waterbody segment(s) ultimately receiving the discharge, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs

and WLAs, and the number of interconnections;

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Report(s) assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover.

The following information must be included in the SWMP concurrent with the applicable deadlines in Appendix F and H (extended by two (2) years) and updated annually thereafter, as necessary:

- Description of practices to achieve compliance with part 2.2.1 (discharges subject to requirements related to approved TMDLs) including:
 - The person(s) or department responsible for the measure;
 - The BMPs for the control measure or permit requirement;
 - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment.
- Description of practices to achieve compliance with part 2.2.2 (discharges to certain water quality limited waters subject to additional requirements) including:
 - The person(s) or department responsible for the measure;
 - The BMPs for the control measure or permit requirement;
 - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment;
- Description of any other practices to achieve compliance with part 2.1 (water quality based requirements).

2.0. Non-Numeric Effluent Limitations

The permittee shall develop, implement, and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act and the Massachusetts Water Quality Standards.

2.1. Water Quality Based Effluent Limitations

Pursuant to Clean Water Act 402(p)(3)(B)(iii), this permit includes provisions to ensure that discharges from the permittee's small MS4 do not cause or contribute to an exceedance of water quality standards, in addition to requirements to reduce the discharge of pollutants to the maximum extent practicable. The requirements found in this part and part 2.2 constitute appropriate water quality based effluent limits of this permit. Requirements to reduce the discharge of pollutants to the maximum extent practicable are set forth in part 2.3.

2.1.1. Requirement to Meet Water Quality Standards

- a. The permittee shall reduce the discharge of pollutants such that the discharges from the MS4 do not cause or contribute to an exceedance of water quality standards.

- b. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is subject to an approved TMDL identified in part 2.2.1, the permittee is subject to the requirements of part 2.2.1 and Appendix F of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix F. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix F applicable to it will constitute compliance with part 2.1.1.a. of the Permit.
- c. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is water quality limited (see definition in Appendix A) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease) and is not subject to an approved TMDL, or the MS4 is located within a municipality listed in part 2.2.2.a.-b., the permittee is subject to the requirements of part 2.2.2 and Appendix H of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix H. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix H applicable to it will constitute compliance with part 2.1.1.a. of the Permit.
- d. Except where a pollutant of concern in a discharge is subject to the requirements of part 2.2.1 and/or part 2.2.2 of this permit or is the result of an illicit discharge and subject to part 2.3.4 of this Permit, if a pollutant in a discharge from the MS4 is causing or contributing to a violation of applicable water quality criteria² for the receiving water, the permittee shall, as expeditiously as possible, but no later than 60 days of becoming aware of the situation, reduce or eliminate the pollutant in its discharge such that the discharge meets applicable water quality criteria.

2.1.2. Increased Discharges

- a. Any increased discharge, including increased pollutant loading(s) through the MS4 to waters of the United States is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate³. Any authorization of an increased discharge by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.
- b. There shall be no increased discharges, including increased pollutant loading(s) from the MS4 to impaired waters listed in categories 5 or 4b on the most recent Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) unless the permittee demonstrates that there is no net increase in loading from the MS4 to the impaired water of the pollutant(s) for which the waterbody is impaired. The permittee may demonstrate compliance with this provision by *either*:

² Applicable water quality criteria are part of the state standards that have been federally approved as of the effective date of this permit and are compiled by EPA at <http://www.epa.gov/waterscience/standards/wqslibrary/>

³ Contact MassDEP for guidance on compliance with 314 CMR 4.04

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- i. Documenting that the pollutant(s) for which the waterbody is impaired is not present in the MS4's discharge and retaining documentation of this finding with the SWMP; or
 - ii. Documenting that the total load of the pollutant(s) of concern from the MS4 to any impaired portion of the receiving water will not increase as a result of the activity and retaining documentation of this finding in the SWMP. Unless otherwise determined by the Permittee, USEPA or by MassDEP that additional demonstration is necessary, compliance with the requirements of part 2.2.2 and part 2.3.6 of this Permit, including all reporting and documentation requirements, shall be considered as demonstrating no net increase as required by this part.
- c. The requirements of this part are independent of permit conditions requiring reduction in discharges of pollutants as set forth in parts 2.1.1 and 2.2 (water quality based requirements) and 2.3 (requirements to reduce discharge of pollutants to the maximum extent practicable). Permittees remain subject to requirements to reduce the discharge of pollutants from the MS4 as set forth in those parts.

2.2. Discharges to Certain Impaired Waters

The permittee shall identify in the SWMP and Annual Reports all MS4 discharges, including both outfalls and interconnections to other MS4s or other separate storm sewer systems, that:

- Are subject to Total Maximum Daily Load (TMDL) related requirements as identified in part 2.2.1.
- Are subject to additional requirements to protect water quality as identified in part 2.2.2.

The discharge location from an interconnection shall be determined based on the receiving water of the outfall from the interconnected system.

2.2.1. Discharges Subject to Requirements Related to an Approved TMDL

- a. "Approved TMDLs" are those that have been approved by EPA as of the date of issuance of this permit.
- b. The MS4s specified below discharge to waters within Massachusetts that are subject to TMDLs, or in some cases, to tributaries of such waters, and shall comply with the requirements of Appendix F, part A. Appendix F identifies, by section, the provisions the permittee shall implement to be consistent with the terms of the approved TMDL. Alternatively, EPA may notify the permittee that an individual permit application is necessary in accordance with part 1.8.a.

- i. The following is a list of municipalities in the Charles River Watershed:

1.

Arlington	Mendon
Ashland	Milford
Bellingham	Millis
Belmont	Natick
Brookline	Needham

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Cambridge	Newton
Dedham	Norfolk
Dover	Sherborn
Foxborough	Walpole
Franklin	Waltham
Holliston	Watertown
Hopedale	Wayland
Hopkinton	Wellesley
Lexington	Weston
Lincoln	Westwood
Medfield	Wrentham
Medway	

Permittees that operate regulated MS4s located in municipalities listed above that discharge to the Charles River or its Tributaries shall meet the requirements of Appendix F, part A.I with respect to the reduction of phosphorus discharges from their MS4.

- ii. The following is a list of municipalities that contain a lake or pond subject to an approved lake or pond phosphorus TMDL in the Northern Blackstone Basin, Chicopee Basin, Connecticut Basin, French Basin, Millers Basin or in the watershed of Bare Hill Pond, Flint Pond, Indian Lake, Lake Boon, Lake Quinsigamond, Leesville Pond, Salisbury Pond, Quaboag Pond or Quacumquasit Pond.

1.

Auburn	Millbury
Charlton	Oxford
Dudley	Shrewsbury
Gardner	Spencer
Grafton	Springfield
Granby	Stow
Hadley	Templeton
Harvard	Westminster
Hudson	Winchendon
Leicester	Wilbraham
Ludlow	

Permittees that operate regulated MS4s in the above municipalities that discharge to waterbodies listed on Table F-6 in Appendix F or their tributaries, and any other MS4 that discharges to waterbodies listed on Table F-6 in Appendix F or their tributaries,

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shall meet the requirements of Appendix F, part A.II with respect to reduction of phosphorus discharges from their MS4.

iii. The following is a list of municipalities that contain waters subject to an approved TMDL for bacteria or pathogens.

1.

Abington	Marshfield
Acushnet	Mashpee
Andover	Mattapoisett
Avon	Medfield
Barnstable	Medway
Bedford	Melrose
Bellingham	Mendon
Belmont	Milford
Berkley	Millis
Beverly	Milton
Billerica	Nahant
Bourne	Natick
Brewster	Needham
Bridgewater	New Bedford
Brockton	Newton
Brookline	Norfolk
Burlington	North Andover
Cambridge	Norton
Canton	Norwell
Chatham	Norwood
Cohasset	Orleans
Concord	Peabody
Danvers	Pembroke
Dartmouth	Plymouth
Dedham	Raynham
Dennis	Rehoboth
Dighton	Revere
Dover	Rockland
Duxbury	Rockport
East Bridgewater	Salem
Eastham	Sandwich
Essex	Saugus
Everett	Scituate
Fairhaven	Seekonk
Fall River	Sharon

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Falmouth	Sherborn
Foxborough	Somerset
Franklin	Stoughton
Freetown	Swampscott
Gloucester	Swansea
Hanover	Taunton
Hanson	Tewksbury
Harwich	Wakefield
Holliston	Walpole
Hopedale	Waltham
Hopkinton	Wareham
Ipswich	Watertown
Kingston	Wellesley
Lawrence	Wellfleet
Lexington	West Bridgewater
Lincoln	Weston
Lynn	Westport
Lynnfield	Westwood
Malden	Whitman
Manchester	Wilmington
Mansfield	Winthrop
Marblehead	Yarmouth
Marion	

The operators of MS4s located in municipalities listed above that discharge to a waterbody segment listed on Table F-8 in Appendix F and any other MS4 that discharges directly to a waterbody segment listed on Table F-8 in Appendix F shall meet the requirements of Appendix F, part A.III with respect to reduction of bacteria/pathogens discharges from their MS4.

- iv. The following is a list of municipalities located on Cape Cod that contain waters subject to an approved TMDL for nitrogen (Total Nitrogen).

1.

Bourne
Barnstable
Chatham
Falmouth
Harwich
Mashpee
Orleans
Yarmouth

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Permittees that operate regulated MS4s located in the municipalities above that discharge to waterbodies found on Table F-9 in Appendix F or their tributaries and any other MS4 that discharges to waterbodies found on Table F-9 in Appendix F or their tributaries shall meet the requirements of Appendix F, part A.IV with respect to reduction of nitrogen discharges from their MS4.

v. The following is a list of municipalities located in the Assabet River Watershed:

1.

Acton	Hudson
Berlin	Littleton
Bolton	Marlborough
Boxborough	Maynard
Boylston	Northborough
Carlisle	Shrewsbury
Clinton	Stow
Concord	Westborough
Grafton	Westford
Harvard	

Permittees that operate regulated MS4s located in the municipalities above that discharge to the Assabet River or its tributaries shall meet the requirements of Appendix F part A.V with respect to reduction of phosphorus discharges from their MS4.

c. The MS4s specified below discharge to waters, or tributaries of waters, that have been identified in an adjacent state’s approved TMDL as being impaired due, in part, to MS4 stormwater discharges in Massachusetts, and shall comply with the requirements of Appendix F, part B. Appendix F identifies, by section, the provisions the permittee shall implement to be consistent with the reasonable assumptions related to Massachusetts MS4 discharges. Alternatively, EPA may notify the permittee that an individual permit application is necessary in accordance with part 1.8.a.

i. The following is a list of municipalities in Massachusetts located in the watershed of Long Island Sound, which has an approved TMDL for nitrogen (Total Nitrogen).

1.

Adams	North Adams
Agawam	Northampton
Amherst	Oxford
Ashburnham	Palmer
Ashby	Paxton
Auburn	Pelham
Belchertown	Pittsfield
Charlton	Richmond
Cheshire	Russell

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Chicopee	Rutland
Dalton	South Hadley
Douglas	Southampton
Dudley	Southbridge
East Longmeadow	Southwick
Easthampton	Spencer
Gardner	Springfield
Granby	Sturbridge
Hadley	Sutton
Hampden	Templeton
Hatfield	Ware
Hinsdale	Webster
Holyoke	West Springfield
Lanesborough	Westfield
Leicester	Westhampton
Lenox	Westminster
Longmeadow	Wilbraham
Ludlow	Williamsburg
Millbury	Winchendon
Monson	

Permittees that operate regulated MS4s located in the municipalities above that discharge to a water within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed shall meet the requirements of Appendix F part B. I with respect to nitrogen discharges from their MS4.

- ii. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing phosphorus to waterbody segments that have out of state approved TMDLs for phosphorus:

1.

Attleboro
North Attleborough
Plainville
Rehoboth
Seekonk
Swansea

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-12 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. II with respect to phosphorus discharges from their MS4.

- iii. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing bacteria/pathogens to waterbody segments that have out of state approved TMDLs for bacteria/pathogens:

1.

Attleboro
North Attleborough
Plainville
Rehoboth
Seekonk

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-13 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. III with respect to bacteria/pathogens discharges from their MS4.

iv. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing metals (cadmium, lead, aluminum iron) to waterbody segments that have out of state approved TMDLs for metals (cadmium, lead, aluminum, iron):

1.

Attleboro
North Attleborough
Plainville
Seekonk

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-14 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. IV with respect to metals discharges from their MS4.

2.2.2. Discharges to Certain Water Quality Limited Waters Subject to Additional Requirements

For purposes of this permit, a ‘water quality limited water body’ is any water body that does not meet applicable water quality standards, including but not limited to waters listed in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b).

If there is a discharge from the MS4 to a water quality limited waterbody where pollutants typically found in stormwater (specifically nutrients (Total Nitrogen or Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride), metals (Cadmium, Copper, Iron, Lead or Zinc) and oil and grease (Petroleum Hydrocarbons or Oil and Grease)) are the cause of the impairment and there is not an approved TMDL, or the MS4 is located in a town listed in part 2.2.2.a.-b, the permittee shall comply with the provisions in Appendix H applicable to it.

In the absence of a defined pollutant reduction target and where no approved TMDL has been established, this permit part and Appendix H define an iterative approach addressing pollutant reductions to waterbodies where the permittee’s discharge is causing or contributing to an excursion above water quality standards due to nutrients (Total Nitrogen Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride), metals

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(Cadmium, Copper, Iron, Lead or Zinc) or oil and grease (Petroleum Hydrocarbons or Oil and Grease).

a. Discharges to water quality limited waterbodies where nitrogen (Total Nitrogen) is the cause of the impairment, or their tributaries

i. The requirements of this part are applicable to:

1. Permittees (including traditional and non-traditional MS4s) that own or operate an MS4 in the following municipalities. Discharges from MS4s within these municipalities are to waterbodies that are impaired due to nitrogen (Total Nitrogen), or their tributaries.

Abington	Mattapoisett
Acushnet	Middleborough
Attleboro	New Bedford
Avon	Norton
Barnstable	Peabody
Berkley	Pembroke
Bourne	Plainville
Bridgewater	Plymouth
Brockton	Plympton
Carver	Raynham
Dartmouth	Rehoboth
Dighton	Rochester
East Bridgewater	Salem
Easton	Seekonk
Fairhaven	Sharon
Fall River	Somerset
Foxborough	Stoughton
Freetown	Swansea
Halifax	Taunton
Hanson	Wakefield
Holbrook	Wareham
Kingston	West Bridgewater
Lakeville	Westport
Lynnfield	Whitman
Mansfield	Wrentham
Marion	Yarmouth

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to nitrogen (Total Nitrogen), or a tributary of such water.

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- ii. Permittees subject to part 2.2.2.a.i above shall meet the requirements of Appendix H part I with respect to the control of nitrogen discharges from their MS4;
 - iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a nitrogen (Total Nitrogen) impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.a.i and Appendix H part I.
- b. Discharges to water quality limited waterbodies where phosphorus (“Total Phosphorus”) is the cause of the impairment, or their tributaries
- i. The requirements of this part are applicable to:
 - 1. Permittees (including traditional and non-traditional MS4s) that own or operate an MS4 in the following municipalities. Discharges from MS4s within these municipalities are to waterbodies that are impaired due to phosphorus (Total Phosphorus), or their tributaries.

Abington	Lynn
Acushnet	Lynnfield
Andover	Malden
Arlington	Mansfield
Ashburnham	Marlborough
Ashland	Mashpee
Auburn	Medfield
Avon	Medford
Ayer	Melrose
Barnstable	Mendon
Bedford	Methuen
Belchertown	Millbury
Belmont	Millville
Billerica	Milton
Blackstone	North Andover
Bolton	Northbridge
Brewster	Norton
Bridgewater	Norwood
Brockton	Oxford
Burlington	Peabody
Cambridge	Pembroke
Canton	Pepperell
Carlisle	Pittsfield

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Carver	Quincy
Chelmsford	Randolph
Chelsea	Reading
Clinton	Revere
Concord	Rockland
Dalton	Salem
Dedham	Scituate
Douglas	Seekonk
Dover	Sharon
Dracut	Shirley
Dunstable	Shrewsbury
East Bridgewater	Somerville
Eastham	Southampton
Easthampton	Spencer
Everett	Springfield
Falmouth	Stoneham
Fitchburg	Stoughton
Foxborough	Sudbury
Framingham	Sutton
Gloucester	Taunton
Grafton	Tewksbury
Granby	Townsend
Groton	Tyngsborough
Halifax	Upton
Hanover	Uxbridge
Hanson	Wakefield
Harvard	Walpole
Haverhill	Wareham
Hinsdale	Watertown
Hopkinton	Wayland
Hudson	West Bridgewater
Lancaster	Westfield
Lawrence	Westminster
Leicester	Westwood
Lenox	Whitman
Leominster	Wilmington
Lexington	Winchendon
Littleton	Winchester
Lowell	Winthrop

Lunenburg	Woburn
Lynn	

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to phosphorus (“Total Phosphorus”), or to a tributary of such water.
 - ii. The permittees subject to part 2.2.2.b.i. above shall meet all requirements of Appendix H part II with respect to the control of phosphorus discharges from the MS4.
 - iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a phosphorus (“Total Phosphorus”) impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.b.i and Appendix H part II.
- c. Discharges to water quality limited waterbodies where bacteria or pathogens is the cause of the impairment
- i. The requirements of this part are applicable to:
 1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where bacteria or pathogens (E. Coli, Enterococcus or Fecal Coliform) is the cause of the impairment.
 2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to bacteria or pathogens.
 - ii. The permittees subject to part 2.2.2.c.i. shall meet all requirements of Appendix H part III with respect to reduction of bacteria or pathogens discharges from the MS4.
- d. Discharges to water quality limited waterbodies where chloride (Chloride) is the cause of the impairment
- i. The requirements of this part are applicable to:
 1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where chloride (Chloride) is the cause of the impairment.
 2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to chloride (Chloride).
 - ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part IV with respect to reduction of chloride discharges from the MS4.
- e. Discharges to water quality limited waterbodies where oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment

- i. The requirements of this part are applicable to:
 1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where oil and grease, solids or metals (Oil and Grease, Petroleum Hydrocarbons TSS, Turbidity, Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment.
 2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc).
- ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part V with respect to reduction of solids, oil and grease or metals discharges from the MS4.

2.3. Requirements to Reduce Pollutants to the Maximum Extent Practicable (MEP)

The permittee shall reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) as detailed in parts 2.3.2 through 2.3.7.

2.3.1. Control Measures

- a. Permittees authorized under the MS4-2003 permit shall continue to implement their existing SWMPs while updating their SWMPs pursuant to this permit. This permit does not extend the compliance deadlines set forth in the MS4-2003 permit.
- b. Implementation of one or more of the minimum control measures described in parts 2.3.2- 2.3.7 or other permit requirements may be shared with another entity (including another interconnected MS4) or the other entity may fully implement the measure or requirement, if the following requirements are satisfied:
 - The other entity, in fact, implements the control measure.
 - The particular control measure or component thereof undertaken by the other entity is at least as stringent as the corresponding permit requirement.
 - The other entity agrees to implement the control measure on the permittee's behalf. The annual reports must specify that the permittee is relying on another entity to satisfy some of its permit obligations and specify what those obligations are.
 - If the permittee is relying on another governmental entity regulated under 40 CFR §122 to satisfy all of its permit obligations, including the obligation to file annual reports, the permittee shall note that fact in its NOI, but is not required to file annual reports.
 - The permittee remains responsible for compliance with all permit obligations if the other entity fails to implement the control measures (or component thereof). The permittee may enter into a legally binding agreement with the other entity regarding the other entity's performance of control measures, but the permittee remains ultimately responsible for permit compliance.

2.3.2. Public Education and Outreach

Objective: The permittee shall implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public

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education program is to increase knowledge and change behavior of the public so that pollutants in stormwater are reduced.

- a. The permittee shall continue to implement the public education program required by the MS4-2003 permit by distributing educational material to the MS4 community. The educational program shall define educational goals, express specific messages, define the targeted audience for each message, and identify responsible parties for program implementation. If appropriate for the target audience, materials may be developed in a language other than English. At a minimum, the program shall provide information concerning the impact of stormwater discharges on water bodies within the community, especially those waters that are impaired or identified as priority waters. The program shall identify steps and/or activities that the public can take to reduce the pollutants in stormwater runoff and their impacts to the environment.
- b. The educational program shall include education and outreach efforts for the following four audiences: (1) residents, (2) businesses, institutions (churches, hospitals), and commercial facilities, (3) developers (construction), and (4) industrial facilities, unless one of these audiences is not present in the MS4 community. In such a situation, the MS4 must document in both the NOI and SWMP which audience is absent from the community and no educational messages are required to that audience.
- c. The permittee shall distribute a minimum of two (2) educational messages over the permit term to each audience identified in part 2.3.2.b. The distribution of materials to each audience shall be spaced at least a year apart. Educational messages may be printed materials such as brochures or newsletters; electronic materials such as websites; mass media such as newspaper articles or public service announcement (radio or cable); targeted workshops on stormwater management, or displays in a public area such as town/city hall. The permittee may use existing materials if they are appropriate for the message the permittee chooses to deliver or the permittee may develop its own educational materials. The permittee may partner with other MS4s, community groups or watershed associations to implement the education program to meet this permit requirement.

Some EPA educational materials are available at: <http://cfpub.epa.gov/npstbx/index.html>.

- d. The permittee shall, at a minimum, consider the topics listed in part 2.3.2.d.i. – iv when developing the outreach/education program. The topics are not exclusive and the permittee shall focus on those topics most relevant to the community.
 - i. Residential program: effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses) on water quality; benefits of appropriate on-site infiltration of stormwater; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; proper management of pet waste; maintenance of septic systems. If the small MS4 area has areas serviced by septic systems, the permittee shall consider information pertaining to maintenance of septic systems as part of its education program.
 - ii. Business/Commercial/Institution program: proper lawn maintenance (use of pesticides, herbicides and fertilizer, and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses); benefits of appropriate on-site infiltration of stormwater; building maintenance (use of detergents); use of salt or other de-icing and anti-icing materials (minimize their use); proper storage

of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and contamination to ground water); proper storage of materials (emphasize pollution prevention); proper management of waste materials and dumpsters (cover and pollution prevention); proper management of parking lot surfaces (sweeping); proper car care activities (washing of vehicles and maintenance); and proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs (discharges must be dechlorinated and otherwise free from pollutants).

- iii. Developers and Construction: proper sediment and erosion control management practices; information about Low Impact Development (LID) principles and technologies; and information about EPA's construction general permit (CGP). This education can also be a part of the Construction Site Stormwater Runoff Control measure detailed in part 2.3.5.
 - iv. Industrial program: equipment inspection and maintenance; proper storage of industrial materials (emphasize pollution prevention); proper management and disposal of wastes; proper management of dumpsters; minimization of use of salt or other de-icing/anti-icing materials; proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and ground water contamination); benefits of appropriate on-site infiltration of stormwater runoff from areas with low exposure to industrial materials such as roofs or employee parking; proper maintenance of parking lot surfaces (sweeping); and requirements for coverage under EPA's Multi-Sector General Permit.
- e. The program shall show evidence of focused messages for specific audiences as well as evidence that progress toward the defined educational goals of the program has been achieved. The permittee shall identify methods that it will use to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge.
 - f. The permittee shall modify any ineffective messages or distribution techniques for an audience prior to the next scheduled message delivery.
 - g. The permittee shall document in each annual report the messages for each audience; the method of distribution; the measures/methods used to assess the effectiveness of the messages, and the method/measures used to assess the overall effectiveness of the education program.

2.3.3. Public Involvement and participation

Objective: The permittee shall provide opportunities to engage the public to participate in the review and implementation of the permittee's SWMP.

- a. All public involvement activities shall comply with state public notice requirements (MGL Chapter 30A, Sections 18 – 25 – effective 7/10/2010). The SWMP and all annual reports shall be available to the public.
- b. The permittee shall annually provide the public an opportunity to participate in the review and implementation of the SWMP.

- c. The permittee shall report on the activities undertaken to provide public participation opportunities including compliance with part 2.3.3.a. Public participation opportunities pursuant to part 2.3.3.b may include, but are not limited to, websites; hotlines; clean-up teams; monitoring teams; or an advisory committee.

2.3.4. Illicit Discharge Detection and Elimination (IDDE) Program

Objective: The permittee shall implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges.

- a. Legal Authority - The IDDE program shall include adequate legal authority to: prohibit illicit discharges; investigate suspected illicit discharges; eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system; and implement appropriate enforcement procedures and actions. Adequate legal authority consists of a currently effective ordinance, by-law, or other regulatory mechanism. For permittees authorized by the MS4-2003 permit, the ordinance, by-law, or other regulatory mechanism was a requirement of the MS4-2003 permit and was required to be effective by May 1, 2008. For new permittees the ordinance, by-law, or other regulatory mechanism shall be in place within 3 years of the permit effective date.
- b. During the development of the new components of the IDDE program required by this permit, permittees authorized by the MS4-2003 permit must continue to implement their existing IDDE program required by the MS4-2003 permit to detect and eliminate illicit discharges to their MS4.

2.3.4.1. Definitions and Prohibitions

The permittee shall prohibit illicit discharges and sanitary sewer overflows (SSOs) to its MS4 and require removal of such discharges consistent with parts 2.3.4.2 and 2.3.4.4 of this permit.

An SSO is a discharge of untreated sanitary wastewater from a municipal sanitary sewer.

An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

2.3.4.2. Elimination of Illicit Discharges

- a. Upon detection of an illicit discharge, the permittee shall locate, identify and eliminate the illicit discharge as expeditiously as possible. Upon identification of the illicit source the MS4 notify all responsible parties for any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities. Where elimination of an illicit discharge within 60 days of its identification as an illicit discharge is not possible, the permittee shall establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the permittee's annual reports. The permittee shall immediately commence actions necessary for elimination. The permittee shall diligently pursue elimination of all illicit discharges. In the interim, the permittee shall take all reasonable and prudent measures to minimize the discharge of pollutants to and from its MS4.
- b. The period between identification and elimination of an illicit discharge is not a grace period. Discharges from an MS4 that are mixed with an illicit discharge are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

2.3.4.3. Non-Stormwater Discharges

The permittee may presume that the sources of non-stormwater listed in part 1.4 of this permit need not be addressed. However, if the permittee identifies any of these sources as significant contributors of pollutants to the MS4, then the permittee shall implement measures to control these sources so they are no longer significant contributors of pollutants, and/or eliminate them entirely, consistent with part 2.3.4.

2.3.4.4. Sanitary Sewer Overflows

- a. Upon detection of an SSO the permittee shall eliminate it as expeditiously as possible and take interim mitigation measures to minimize the discharge of pollutants to and from its MS4 until elimination is completed.
- b. The permittee shall identify all known locations where SSOs have discharged to the MS4 within the previous five (5) years. This shall include SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems. Within one (1) year of the effective date of the permit, the permittee shall develop an inventory of all identified SSOs indicating the following information, if available:
 1. Location (approximate street crossing/address and receiving water, if any);
 2. A clear statement of whether the discharge entered a surface water directly or entered the MS4;
 3. Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
 4. Estimated volume(s) of the occurrence;
 5. Description of the occurrence indicating known or suspected cause(s);
 6. Mitigation and corrective measures completed with dates implemented; and
 7. Mitigation and corrective measures planned with implementation schedules.

The permittee shall maintain the inventory as a part of the SWMP and update the inventory annually, all updates shall include the information in part 2.3.4.4.b.1-7.

- c. In accordance with Paragraph B.12 of Appendix B of this permit, upon becoming aware of an SSO to the MS4, the permittee shall provide oral notice to EPA within 24 hours. Additionally, the permittee shall provide written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence and shall include the information in the updated inventory. The notice shall contain all of the information listed in part 2.3.4.4.b. Where common notification requirements for SSOs are included in multiple NPDES permits issued to a permittee, a single notification may be made to EPA as directed in the permittee's wastewater or CSO NPDES permit and constitutes compliance with this part.
- d. The permittee shall include and update the SSO inventory in its annual report, including the status of mitigation and corrective measures implemented by the permittee to address each SSO identified pursuant to this part.
- e. The period between detection and elimination of a discharge from the SSO to the MS4 is not a grace period. Discharges from an MS4 that are mixed with an SSO are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

2.3.4.5. System mapping

The permittee shall develop a revised and more detailed map than was required by the MS4-2003 permit. This revised map of the MS4 shall be completed in two phases as outlined below. The mapping shall include a depiction of the permittee's separate storm sewer system in the permit area. The mapping is intended to facilitate the identification of key infrastructure and factors influencing proper system operation, and the potential for illicit sanitary sewer discharges.

- a. Phase I: The system map shall be updated within two (2) years of the permit effective date to include the following information:
 - Outfalls and receiving waters (required by MS4-2003 permit)
 - Open channel conveyances (swales, ditches, etc.)
 - Interconnections with other MS4s and other storm sewer systems
 - Municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
 - Waterbodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of waters report pursuant to Clean Water Act section 303(d) and 305(b)
 - Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations. For the purpose of this permit, a catchment is the area that drains to an individual outfall or interconnection.

- b. Phase II: The system map shall be updated annually as the following information becomes available during implementation of catchment investigation procedures in part 2.3.4.8. This information must be included in the map for all outfalls within ten (10) years of the permit effective date:
 - Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
 - Pipes
 - Manholes
 - Catch basins
 - Refined catchment delineations. Catchment delineations shall be updated to reflect information collected during catchment investigations
 - Municipal sanitary sewer system (if available)
 - Municipal combined sewer system (if applicable).

- c. Recommended elements to be included in the system map as information becomes available:
 - Storm sewer material, size (pipe diameter) and age
 - Sanitary sewer system material, size (pipe diameter) and age
 - Privately-owned stormwater treatment structures
 - Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high-density urban areas
 - Area where the permittee's MS4 has received or could receive flow from septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
 - Seasonal high water table elevations impacting sanitary alignments
 - Topography
 - Orthophotography

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- Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
 - Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates).
- d. The mapping may be produced by hand or through computer-aided methods (e.g. GIS). The required scale and detail of the map shall be appropriate to facilitate a rapid understanding of the system by the permittee, EPA and the state. In addition, the mapping shall serve as a planning tool for the implementation and phasing of the IDDE program and demonstration of the extent of complete and planned investigations and corrections. The permittee shall update the mapping as necessary to reflect newly discovered information and required corrections or modifications.
- e. The permittee shall report on the progress towards the completion of the system map in each annual report.

2.3.4.6. Written Illicit Discharge Detection and Elimination Program

The IDDE program shall be recorded in a written (hardcopy or electronic) document. The IDDE program shall include each of the elements described in parts 2.3.4.7 and part 2.3.4.8, unless the permittee provides a written explanation within the IDDE program as to why a particular element is not applicable to the permittee.

Notwithstanding the permittee's explanation, EPA may at any time determine that a particular element is in fact applicable to the permittee and require the permittee to add it to the IDDE program. The written (hardcopy or electronic) IDDE program shall be completed within one (1) year of the effective date of the permit and updated in accordance with the milestones of this part. The permittee shall implement the IDDE program in accordance with the goals and milestones contained in this part.

- a. The written (hardcopy or electronic) IDDE program shall include a reference or citation of the authority the permittee will use to implement all aspects of the IDDE program.
- b. Statement of IDDE Program Responsibilities - The permittee shall establish a written (hardcopy or electronic) statement that clearly identifies responsibilities with regard to eliminating illicit discharges. The statement shall identify the lead municipal agency(ies) or department(s) responsible for implementing the IDDE Program as well as any other agencies or departments that may have responsibilities for aspects of the program (e.g., board of health responsibilities for overseeing septic system construction; sanitary sewer system staff; inspectional services for enforcing plumbing codes; town counsel responsibilities in enforcement actions, etc.). Where multiple departments and agencies have responsibilities with respect to the IDDE program specific areas of responsibility shall be defined and processes for coordination and data sharing shall be established and documented.
- c. Program Procedures – The permittee shall include in the written IDDE program all written procedures developed in accordance with the requirements and timelines in parts 2.3.4.7 and 2.3.4.8 below. At a minimum this shall include the written procedures for dry weather outfall screening and sampling and for catchment investigations.

2.3.4.7. Assessment and Priority Ranking of Outfalls/Interconnections

The permittee shall assess and priority rank the outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. This ranking will determine the priority order for

screening of outfalls and interconnections pursuant to part 2.3.4.7.b, catchment investigations for evidence of illicit discharges and SSOs pursuant to part 2.3.4.8, and provides the basis for determining permit milestones of this part.

a. Outfall/Interconnection Inventory and Initial Ranking:

An initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information shall be completed within one (1) year from the effective date of the permit; an updated inventory and ranking will be provided in each annual report thereafter. The inventory shall be updated annually to include data collected in connection with the dry weather screening and other relevant inspections conducted by the permittee.

- i. The outfall and interconnection inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings and other activities under the permittee's IDDE program.
 - An outfall means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. (40 CFR § 122.26(b)(9)). However, it is strongly recommended that a permittee inspect all accessible portions of the system as part of this process. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.
 - An interconnection means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.
- ii. The permittee shall classify each of the permittee's outfalls and interconnections into one of the following categories:
 - Problem Outfalls: outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input.⁴ Problem Outfalls need not be screened pursuant to part 2.3.4.7.b.
 - High Priority Outfalls: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:
 - discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds;
 - determined by the permittee as high priority based on the characteristics listed below or other available information;
 - Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

⁴ Likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

- Excluded outfalls: outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.
- iii. The permittee shall priority rank outfalls into the categories above (except for excluded outfalls), based on the following characteristics of the defined initial catchment area where information is available:
- Past discharge complaints and reports.
 - Poor receiving water quality- the following guidelines are recommended to identify waters as having a high illicit discharge potential: exceeding water quality standards for bacteria; ammonia levels above 0.5 mg/l; surfactants levels greater than or equal to 0.25 mg/l.
 - Density of generating sites- Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
 - Age of development and infrastructure – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
 - Sewer conversion – contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
 - Historic combined sewer systems – contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
 - Surrounding density of aging septic systems – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
 - Culverted streams – any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
 - Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.
 - The permittee may also consider additional relevant characteristics, including location-specific characteristics; if so, the permittee shall include the additional characteristics in its written (hardcopy or electronic) IDDE program.
- b. Dry Weather Outfall and Interconnection Screening and Sampling
All outfalls/interconnections (excluding Problem and excluded Outfalls) shall be inspected for the presence of dry weather flow within three (3) years of the permit effective date. The permittee shall screen all High and Low Priority Outfalls in accordance with their initial ranking developed at part 2.3.4.7.a.
- i. Written procedure: The permittee shall develop an outfall and interconnection screening and sampling procedure to be included in the IDDE program within one (1) year of the permit effective date. This procedure shall include the following procedures for:
- sample collection,
 - use of field kits,

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- storage and conveyance of samples (including relevant hold times), and
- field data collection and storage.

An example screening and sampling protocol (*EPA New England Bacterial Source Tracking Protocol*) can be found on EPA's website.

- ii. Weather conditions: Dry weather screening and sampling shall proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring.
- iii. Screening requirements: For each outfall/interconnection:
 1. The permittee shall record all of the following information and include it in the outfall/interconnection inventory and priority ranking:
 - unique identifier,
 - receiving water,
 - date of most recent inspection,
 - dimensions,
 - shape,
 - material (concrete, PVC),
 - spatial location (latitude and longitude with a minimum accuracy of +/-30 feet,
 - physical condition,
 - indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatables, or oil sheen).
 2. If an outfall/interconnection is inaccessible or submerged, the permittee shall proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results.
 3. If no flow is observed, but evidence of illicit flow exists, the permittee shall revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow (proceed as in iv. below).
 4. Where dry weather flow is found at an outfall/interconnection, at least one (1) sample shall be collected, and:
 - a) Samples shall be analyzed at a minimum for:
 - ammonia,
 - chlorine,
 - conductivity,
 - salinity,
 - *E. coli* (freshwater receiving water) or enterococcus (saline or brackish receiving water),
 - surfactants (such as MBAS),
 - temperature, and
 - pollutants of concern⁵
 - b) All analyses with the exception of indicator bacteria and pollutants of concern can be performed with field test kits or field instrumentation and are not subject to 40

⁵ Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL as indicated in Appendix F; the sample shall be analyzed for the pollutant(s) of concern identified as the cause of the impairment as specified in Appendix G

CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect those parameters at or below the threshold indicator concentrations of 0.5 mg/L for ammonia and 0.25 mg/L for surfactants. Sampling for residual chlorine must use a method with a detection limit of 0.02 mg/L or 20 ug/L.

- iv. The permittee may rely on screening conducted under the MS4-2003 permit, pursuant to an EPA enforcement action, or by the state or EPA to the extent that it meets the requirements of part 2.3.4.7.b.iii.4. All data shall be reported in each annual report. Permittees that have conducted substantially equivalent monitoring to that required by part 2.3.4.7.b as part of an EPA enforcement action can request an exemption from the requirements of part 2.3.4.7.b by submitting a written request to EPA and retaining exemption approval from EPA as part of the SWMP. Until the permittee receives formal written approval of the exemption from part 2.3.4.7.b from EPA the permittee remains subject to all requirements of part 2.3.4.7.b.
 - v. The permittee shall submit all screening data used in compliance with this part in its Annual Report.
- c. Follow-up ranking of outfalls and interconnections:
- i. The permittee's outfall and interconnection ranking (2.3.4.7.a) shall be updated to reprioritize outfalls and interconnections based on information gathered during dry weather screening (part 2.3.4.7.b).
 - ii. Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or sampling results indicating sewer input⁶ shall be considered highly likely to contain illicit discharges from sanitary sources, and such outfalls/interconnections shall be ranked at the top of the High Priority Outfalls category for investigation. At this time, permittees may choose to rank other outfalls and interconnections based on any new information from the dry weather screening.
 - iii. The ranking can be updated continuously as dry weather screening information becomes available, but shall be completed within three (3) years of the effective date of the permit.

2.3.4.8. Catchment Investigations

The permittee shall develop a systematic procedure to investigate each catchment associated with an outfall or interconnection within their MS4 system.

a. Timelines:

- A written catchment investigation procedure shall be developed within 18 months of the permit effective date in accordance with the requirements of part 2.3.4.8.b below.
- Investigations of catchments associated with Problem Outfalls shall begin no later than two (2)

⁶ Likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia \geq 0.5 mg/L, surfactants \geq 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia \geq 0.5 mg/L, surfactants \geq 0.25 mg/L, and detectable levels of chlorine.

years from the permit effective date.

- Investigations of catchments associated with High and Low Priority Outfalls shall follow the ranking of outfalls updated in part 2.3.4.7.c.
- Investigations of catchments associated with Problem Outfalls shall be completed with seven (7) years of the permit effective date
- Investigations of catchments where any information gathered on the outfall/interconnection identifies sewer input⁷ shall be completed within seven (7) years of the permit effective date.
- Investigations of catchments associated with all Problem, High- and Low-Priority Outfalls shall be completed within ten (10) years of the permit effective date.

*For the purposes of these milestones, an individual catchment investigation will be considered complete if all relevant procedures in part 2.3.4.8.c. and 2.3.4.8.d. below have been completed.

b. A written catchment investigation procedure shall be developed that:

- Identifies maps, historic plans and records, and other sources of data**, including but not limited to plans related to the construction of the storm drain and of sanitary sewers, prior work performed on the storm drains or sanitary sewers, board of health or other municipal data on septic system failures or required upgrades, and complaint records related to SSOs, sanitary sewer surcharges, and septic system breakouts. These data sources will be used in identifying system vulnerability factors within each catchment.
- Includes a manhole inspection methodology** that shall describe a storm drain network investigation that involves systematically and progressively observing, sampling (as required below) and evaluating key junction manholes (see definition in Appendix A) in the MS4 to determine the approximate location of suspected illicit discharges or SSOs. The manhole inspection methodology may either start from the outfall and work up the system or start from the upper parts of the catchment and work down the system or be a combination of both practices. Either method must, at a minimum, include an investigation of each key junction manhole within the MS4, even where no evidence of an illicit discharge is observed at the outfall. The manhole inspection methodology must describe the method the permittee will use. The manhole inspection methodology shall include procedures for dry and wet weather investigations.
- Establishes procedures to isolate and confirm sources of illicit discharges** where manhole investigations or other physical evidence or screening has identified that MS4 alignments are influenced by illicit discharges or SSOs. These shall include isolation of the drainage area for implementation of more detailed investigations, inspection of additional manholes along the alignment to refine the location of potential contaminant sources, and methods such as sandbagging key junction manhole inlets, targeted internal plumbing inspections, dye testing, video inspections, or smoke testing to isolate and confirm the sources.

c. Requirements for each catchment investigation associated with an outfall/interconnection:

- For each catchment being investigated, the permittee shall review relevant mapping and historic plans and records gathered in accordance with Part 2.3.4.8.b.i. This review shall be used to identify

⁷ Likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

areas within the catchment with higher potential for illicit connections. The permittee shall identify and record the presence of any of the following specific **System Vulnerability Factors (SVFs)**:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages;
- Common or twin-invert manholes serving storm and sanitary sewer alignments;
- Common trench construction serving both storm and sanitary sewer alignments;
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system;
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system;
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints;
- Areas formerly served by combined sewer systems;
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

EPA recommends the permittee include the following in their consideration of System Vulnerability Factors:

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs;
- Any sanitary sewer and storm drain infrastructure greater than 40 years old;
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);

The permittee shall document the presence or absence of System Vulnerability Factors for each catchment, retain this documentation as part of its IDDE program, and report this information in Annual Reports. Catchments with a minimum of one (1) System Vulnerability Factor are subject to wet weather sampling requirements of part 2.3.4.8.c.ii.2.

ii. For each catchment, the permittee must inspect key junction manholes and gather catchment information on the locations of MS4 pipes, manholes, and the extent of the contributing catchment.

1. For all catchments

- a) Infrastructure information shall be incorporated into the permittee's mapping required at part 2.3.4.5; the permittee will refine their catchment delineation based on the field investigation where appropriate.
- b) The SVF inventory for the catchment will be updated based on information obtained during the inspection, including common (twin invert) manholes, directly piped connections between storm drains and sanitary sewer infrastructure, common weir walls, sanitary sewer underdrain connections and other structural vulnerabilities where sanitary discharges could enter the storm drain system during wet weather.

1) **Where a minimum of one (1) SVF is identified based on previous information**

or the investigation, a wet weather investigation must be conducted at the associated outfall (see below).

- c) During dry weather, key junction manholes⁸ shall be opened and inspected systematically for visual and olfactory evidence of illicit connections (e.g., excrement, toilet paper, gray filamentous bacterial growth, or sanitary products present).
 - 1) If flow is observed, the permittee shall sample the flow at a minimum for ammonia, chlorine and surfactants and can use field kits for these analyses.
 - 2) Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole shall be flagged for further upstream investigation.
 - d) Key junction and subsequent manhole investigations will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.
2. For all catchments with a minimum of one (1) SVF identified
- a) The permittee shall meet the requirements above for dry weather screening
 - b) The permittee shall inspect and sample under wet weather conditions to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.
 - 1) The permittee shall conduct at least one wet weather screening and sampling at the outfall that includes the same parameters required during dry weather screening, part 2.3.4.7.b.iii.4.
 - 2) Wet weather sampling and screening shall proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge. EPA strongly recommends sampling during the spring (March through June) when groundwater levels are relatively high.
 - 3) The permit does not require a minimum rainfall event prior to wet weather screening. However, permittees may incorporate provisions that assist in targeting such discharges, including avoiding sampling during the initial period of discharge (“first flush”) and/or identifying minimum storm event intensities likely to trigger sanitary sewer interconnections.
 - c) This sampling can be done upon completion of any dry weather investigation but must be completed before the catchment investigation is marked as complete.
- iii. All data collected as part of the dry and wet weather catchment investigations shall be recorded and reported in each annual report.
- d. Identification/Confirmation of illicit source
Where the source of an illicit discharge has been approximated between two manholes in the permittee’s MS4, the permittee shall isolate and identify/confirm the source of the illicit discharge using more detailed methods identified in their written procedure (2.3.4.8.b.iii). For outfalls that contained evidence of an illicit discharge, catchment investigations will be considered complete upon

⁸ Where catchments do not contain junction manholes, the dry weather screening and sampling shall be considered as meeting the manhole inspection requirement. In these catchments, dry weather screenings that indicate potential presence of illicit discharges shall be further investigated pursuant to part 2.3.4.8.d. Investigations in these catchments may be considered complete where dry weather screening reveals no flow; no evidence of illicit discharges or SSOs is indicated through sampling results or visual or olfactory means; and no wet weather System Vulnerability Factors are identified.

confirmation of all illicit sources.

e. Illicit discharge removal

When the specific source of an illicit discharge is identified, the permittee shall exercise its authority as necessary to require its removal pursuant to part 2.3.4.2 or 2.3.4.3.

- i. For each confirmed source the permittee shall include in the annual report the following information:
 - the location of the discharge and its source(s);
 - a description of the discharge;
 - the method of discovery;
 - date of discovery;
 - date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal; and
 - estimate of the volume of flow removed.
- ii. Within one year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening shall be conducted. The confirmatory screening shall be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening shall be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment shall be scheduled for additional investigation.

2.3.4.9. Indicators of IDDE Program Progress

The permittee shall define or describe indicators for tracking program success and evaluate and report on the overall effectiveness of the IDDE program in each annual report. At a minimum the permittee shall document in each annual report:

- the number of SSOs and illicit discharges identified and removed,
- the number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure,
- all dry weather and wet weather screening and sampling results and
- the volume of sewage removed

2.3.4.10 Ongoing Screening

Upon completion of all catchment investigations pursuant to part 2.3.4.8.c and illicit discharge removal and confirmation (if necessary) pursuant to paragraph 2.3.4.8.e, each outfall or interconnection shall be reprioritized for screening in accordance with part 2.3.4.8.a and scheduled for ongoing screening once every five years. Ongoing screening shall consist of dry weather screening and sampling consistent with part 2.3.4.7.b; wet weather screening and sampling shall also be required at outfalls where wet weather screening was required due to SVFs and shall be conducted in accordance with part 2.3.4.8.c.ii. All sampling results shall be reported in the permittee's annual report.

2.3.4.11 Training

The permittee shall, at a minimum, annually provide training to employees involved in IDDE program about the program, including how to recognize illicit discharges and SSOs. The permittee shall report on the frequency and type of employee training in the annual report.

2.3.5. Construction Site Stormwater Runoff Control

Objective: The objective of an effective construction stormwater runoff control program is to minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S through the permittee's MS4. The construction site stormwater runoff control program required by this permit is a separate and distinct program from EPA's stormwater construction permit program. (<http://cfpub1.epa.gov/npdes/stormwater/cgp.cfm>)

- a. Permittees shall implement and enforce a program to reduce pollutants in any stormwater runoff discharged to the MS4 from all construction activities that result in a land disturbance of greater than or equal to one acre within the regulated area. The permittee's program shall include disturbances less than one acre if that disturbance is part of a larger common plan of development or sale that would disturb one or more acres. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their existing program and modify as necessary to meet the requirements of this part.
- b. The permittee does not need to apply its construction program requirements to projects that receive a waiver from EPA under the provisions of 40 CFR § 122.26(b) (15) (i).
- c. The permittee shall develop and implement a construction site runoff control program that includes the elements in Paragraphs i. through v. of this part:
 - i. An ordinance or regulatory mechanism that requires the use of sediment and erosion control practices at construction sites. In addition to addressing sediment and erosion control, the ordinance must include controls for other wastes on construction sites such as demolition debris, litter and sanitary wastes. Development of an ordinance or other regulatory mechanism was a requirement of the MS4-2003 permit (See part II.B.4 and part IV.B.4). The ordinance or other regulatory mechanism required by the MS4-2003 permit shall have been effective by May 1, 2008.
 - ii. Written (hardcopy or electronic) procedures for site inspections and enforcement of sediment and erosion control measures. If not already existing, these procedures shall be completed within one (1) year from the effective date of the permit. The procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The program shall provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be documented in the SWMP.
 - iii. Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to BMP design standards in state manuals, such as the Massachusetts Stormwater Handbook⁹, or design standards developed by the MS4. EPA supports and encourages the use of design standards in local programs. Examples of appropriate sediment and erosion control measures for construction sites include local requirements to:

⁹ The handbook is available at: <http://www.mass.gov/dep/water/laws/policies.htm#storm>

1. Minimize the amount of disturbed area and protect natural resources;
 2. Stabilize sites when projects are complete or operations have temporarily ceased;
 3. Protect slopes on the construction site;
 4. Protect all storm drain inlets and armor all newly constructed outlets;
 5. Use perimeter controls at the site;
 6. Stabilize construction site entrances and exits to prevent off-site tracking;
 7. Inspect stormwater controls at consistent intervals.
- iv. Requirements for construction site operators within the MS4 jurisdiction to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes. These wastes may not be discharged to the MS4.
- v. Written procedures for site plan review and inspection and enforcement. If not already existing, the procedures for site plan review and inspection and enforcement shall be completed within one (1) year from the effective date of the permit. The site plan review procedure shall include a pre-construction review by the permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development. The review procedure shall incorporate procedures for the consideration of potential water quality impacts, and procedures for the receipt and consideration of information submitted by the public. The site plan review procedure shall also include evaluation of opportunities for use of low impact design and green infrastructure. When the opportunity exists, the permittee shall encourage project proponents to incorporate these practices into the site design. The procedures for site inspections conducted by the permittee shall include the requirement that inspections occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans, clearly defined procedures for inspections including qualifications necessary to perform the inspections, the use of mandated inspection forms if appropriate, and procedure for tracking the number of site reviews, inspections, and enforcement actions. This tracking information shall be included as part of each annual report required by part 4.4.

2.3.6. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management)

Objective: The objective of this control measure is to reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites. For the purposes of this part (2.3.6.), the following definitions apply:

site is defined as the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.d.)

new development is defined as any construction activities or land alteration resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover.

redevelopment is defined as any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

- a. Permittees shall develop, implement, and enforce a program to address post-construction stormwater runoff from all new development and redevelopment sites that disturb one or more acres and discharge into the permittees MS4 at a minimum. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their program and modify as necessary to meet the requirements of this part.
 - i. The permittee's new development/ redevelopment program shall include sites less than one acre if the site is part of a larger common plan of development or redevelopment which disturbs one or more acre.
 - ii. The permittee shall develop or modify, as appropriate, an ordinance or other regulatory mechanism within two (2) years of the effective date of the permit to contain provisions that are as least as stringent as the following:
 1. Low Impact Development (LID) site planning and design strategies must be used to the maximum extent feasible.
 2. The design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or State approved¹⁰ BMP design guidance.
 3. Stormwater management systems on new development sites shall be designed to:
 - a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;
 - b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2¹¹;
 - c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3¹²;
 - d) Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5;
 - e) Protect Zone II or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6¹³;
 - f) Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9; and
 - g) Require that all stormwater management systems be designed to:
 - 1) Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the

¹⁰ State approved includes any state in the United States, including, but not limited to, approved guidance by the Commonwealth of Massachusetts

¹¹ Requirement necessary for Section 401 water quality certification by Massachusetts

¹² Requirement necessary for Section 401 water quality certification by Massachusetts

¹³ Requirement necessary for Section 401 water quality certification by Massachusetts

site AND/OR

- 2) Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site¹⁴ AND 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site¹⁴. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved¹⁵ BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

4. Redevelopment Requirements

- a) Stormwater management systems on Redevelopment sites shall meet the following sections of part 2.3.6.a.ii.3 to the maximum extent feasible:
 - 1) Part 2.3.6.a.ii.3(a) (Massachusetts Stormwater Standard 1);
 - 2) Part 2.3.6.a.ii.3(b) (Massachusetts Stormwater Standard 2);
 - 3) Part 2.3.6.a.ii.3(c) (Massachusetts Stormwater Standard 3); and
 - 4) The pretreatment and structural best management practices requirements of 2.3.6.a.ii.3(d) and 2.3.6.a.ii.3(e) (Massachusetts Stormwater Standards 5 and 6).
- b) Stormwater management systems on Redevelopment sites shall also improve existing conditions by requiring that stormwater management systems be designed to:
 - 1) Retain the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site AND/OR
 - 2) Remove 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1 where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.
- c) Stormwater management systems on redevelopment sites may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site to meet the equivalent retention or pollutant removal requirements in part 2.3.6.a.ii.4(b).
- d) Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single

¹⁴ The required removal percentage is not required for each storm, it is the average removal over a year that is required

¹⁵ See footnote 14

lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions where feasible and are exempt from part 2.3.6.a.ii.4(a), part 2.3.6.a.ii.4(b) and part 2.3.6.a.ii.4(c). Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of part 2.3.6.a.ii.4(a) – (c) fully.

- iii. The permittee shall require, at a minimum, the submission of as-built drawings no later than two (2) years after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management). The new development/redevelopment program shall have procedures to ensure adequate long-term operation and maintenance of stormwater management practices that are put in place after the completion of a construction project. These procedures may include the use of dedicated funds or escrow accounts for development projects or the acceptance of ownership by the permittee of all privately owned BMPs. These procedures may also include the development of maintenance contracts between the owner of the BMP and the permittee. Alternatively, these procedures may include the submission of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The procedures to require submission of as-built drawings and ensure long term operation and maintenance shall be a part of the SWMP. The permittee shall report in the annual report on the measures that the permittee has utilized to meet this requirement.
- b. Within four (4) years of the effective date of this permit, the permittee shall develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. If the assessment indicates that changes can be made, the assessment shall include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The local planning board and local transportation board should be involved in this assessment. This assessment shall be part of the SWMP. The permittee shall report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.
- c. Within four (4) years from the effective date of the permit, the permittee shall develop a report assessing existing local regulations to determine the feasibility of making, at a minimum, the following practices allowable when appropriate site conditions exist:
 - i. Green roofs;
 - ii. Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and
 - iii. Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

The assessment should indicate if the practices are allowed in the MS4 jurisdiction and under what circumstances are they allowed. If the practices are not allowed, the permittee shall determine what hinders the use of these practices, what changes in local regulations may be made to make them allowable, and provide a schedule for implementation of recommendations. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The permittee shall report in each annual report on its findings and progress towards making the practices allowable. (Information available at:

<http://www.epa.gov/region1/npdes/stormwater/assets/pdf/AddressingBarrier2LID.pdf> and <http://www.mapc.org/resources/low-impact-dev-toolkit/local-codes-lid>)

- d. Four (4) years from the effective date of this permit, the permittee shall identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its MS4 through the reduction of impervious area. Properties and infrastructure for consideration shall include those with the potential for reduction of on-site impervious area (IA) as well as those that could provide reduction of off-site IA. At a minimum, the permittee shall consider municipal properties with significant impervious cover (including parking lots, buildings, and maintenance yards) that could be modified or retrofitted. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances and controls (including swales and detention practices) that could be readily modified or retrofitted to provide reduction in frequency, volume or pollutant loads of such discharges through reduction of impervious cover.

In determining the potential for modifying or retrofitting particular properties, the permittee shall consider factors such as access for maintenance purposes; subsurface geology; depth to water table; proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems; and opportunities for public use and education. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service; and control of discharges to water quality limited waters, first or second order streams, public swimming beaches, drinking water supply sources and shellfish growing areas.

Beginning with the fifth year annual report and in each subsequent annual report, the permittee shall identify additional permittee owned sites and infrastructure that could be retrofitted such that the permittee maintains a minimum of 5 sites in their inventory, until such a time as when the permittee has less than 5 sites remaining. In addition, the permittee shall report on all properties that have been modified or retrofitted with BMPs to mitigate IA that were inventoried in accordance with this part. The permittee may also include in its annual report non-MS4 owned property that has been modified or retrofitted with BMPs to mitigate IA.

2.3.7. Good House Keeping and Pollution Prevention for Permittee Owned Operations

Objective: The permittee shall implement an operations and maintenance program for permittee-owned operations that has a goal of preventing or reducing pollutant runoff and protecting water quality from all permittee-owned operations.

- a. Operations and Maintenance Programs
 - i. Within two (2) years from the effective date of the permit, the permittee shall develop, if not already developed, written (hardcopy or electronic) operations and maintenance procedures for the municipal activities listed below in part 2.3.7.a.ii. These written procedures shall be included as part of the SWMP.

- ii. Within two (2) year of the effective date of this permit, the permittee shall develop an inventory of all permittee owned facilities within the categories listed below. The permittee shall review this inventory annually and update as necessary.
 1. Parks and open space: Establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers including minimizing the use of these products and using only in accordance manufacturer's instruction. Evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality. Protective practices include reduced mowing frequencies, proper disposal of lawn clippings, and use of alternative landscaping materials (e.g., drought resistant planting). Establish pet waste handling collection and disposal locations at all parks and open space where pets are permitted, including the placing of proper signage concerning the proper collection and disposal of pet waste. Establish procedures to address waterfowl congregation areas where appropriate to reduce waterfowl droppings from entering the MS4. Establish procedures for management of trash containers at parks and open space (scheduled cleanings; sufficient number). Establish procedures to address erosion or poor vegetative cover when the permittee becomes aware of it; especially if the erosion is within 50 feet of a surface water.
 2. Buildings and facilities where pollutants are exposed to stormwater runoff: This includes schools (to the extent they are permittee-owned or operated), town offices, police, and fire stations, municipal pools and parking garages and other permittee-owned or operated buildings or facilities. Evaluate the use, storage, and disposal of petroleum products and other potential stormwater pollutants. Provide employee training as necessary so that those responsible for handling these products know proper procedures. Ensure that Spill Prevention Plans are in place, if applicable, and coordinate with the fire department as necessary. Develop management procedures for dumpsters and other waste management equipment. Sweep parking lots and keep areas surrounding the facilities clean to reduce runoff of pollutants.
 3. Vehicles and Equipment: Establish procedures for the storage of permittee vehicles. Vehicles with fluid leaks shall be stored indoors or containment shall be provided until repaired. Evaluate fueling areas owned or operated by the permittee. If possible, place fueling areas under cover in order to minimize exposure. Establish procedures to ensure that vehicle wash waters are not discharged to the municipal storm sewer system or to surface waters. This permit does not authorize such discharges.
- iii. Infrastructure Operations and Maintenance
 1. The permittee shall establish within two (2) year of the effective date of the permit a written (hardcopy or electronic) program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. If the permittee has an existing program to maintain its MS4 infrastructure in a timely manner to reduce or eliminate the discharge of pollutants from the MS4, the permittee shall document the program in the SWMP.

2. The permittee shall optimize routine inspections, cleaning and maintenance of catch basins such that the following conditions are met:
 - Prioritize inspection and maintenance for catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment). Clean catch basins in such areas more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
 - Establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at anytime will be more than 50 percent full.
 - If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, the permittee shall document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources. The permittee shall describe any actions taken in its annual report.
 - For the purposes of this part, an excessive sediment or debris loading is a catch basin sump more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.
 - The permittee shall document in the SWMP and in the first annual report its plan for optimizing catch basin cleaning, inspection plans, or its schedule for gathering information to develop the optimization plan. Documentation shall include metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4. The permittee shall keep a log of catch basins cleaned or inspected.
 - The permittee shall report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins.

3. The permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. All streets with the exception of rural uncurbed roads with no catch basins or high speed limited access highways shall be swept and/or cleaned a minimum of once per year in the spring (following winter activities such as sanding). The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, water quality limited or TMDL waters or other relevant factors as determined by the permittee. The permittee shall report in each annual report the number of miles cleaned or the volume or mass of material removed.

For rural uncurbed roadways with no catch basins and limited access highways, the permittee shall either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping plan within two (2) year of the effective date of the permit, and submit such plan with its year one annual report.

4. The permittee shall ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving

waters. These materials should be managed in compliance with current MassDEP policies:

- For catch basins cleanings:
<http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html>
 - For street sweepings:
<http://www.mass.gov/eea/docs/dep/recycle/laws/stsweep.pdf>.
5. The permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States. For purposes of this MS4 Permit, salt shall mean any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.
 6. The permittee shall establish and implement inspection and maintenance frequencies and procedures for all stormwater treatment structures such as water quality swales, retention/detention basins, infiltration structures, proprietary treatment devices or other similar structures. All permittee-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.
- iv. The permittee shall report in the annual report on the status of the inventory required by this part and any subsequent updates; the status of the O&M programs for the permittee-owned facilities and activities in part 2.3.7.a.ii; and the maintenance activities associated with each.
 - v. The permittee shall keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance activities, inspections and training required by part 2.3.7.a. The permittee shall maintain, consistent with part 4.2.a, all records associated with maintenance and inspection activities required by part 2.3.7.a.

b. Stormwater Pollution Prevention Plan (SWPPP)

The permittee shall develop and fully implement a SWPPP for each of the following permittee-owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater as determined by the permittee. If facilities are located at the same property, the permittee may develop one SWPPP for the entire property. The SWPPP is a separate and different document from the SWMP required in part 1.10. A SWPPP does not need to be developed for a facility if the permittee has either developed a SWPPP or received a no exposure certification for the discharge under the Multi-Sector General Permit or the discharge is authorized under another NPDES permit.

- i. No later than two (2) years from the effective date of the permit, the permittee shall develop and implement a written (hardcopy or electronic) SWPPP for the facilities described above. The SWPPP shall be signed in accordance with the signatory requirements of Appendix B – Subparagraph 11.

ii. The SWPPP shall contain the following elements:

1. Pollution Prevention Team

Identify the staff on the team, by name and title. If the position is unstaffed, the title of the position should be included and the SWPPP updated when the position is filled. The role of the team is to develop, implement, maintain, and revise, as necessary, the SWPPP for the facility.

2. Description of the facility and identification of potential pollutant sources

The SWPPP shall include a map of the facility and a description of the activities that occur at the facility. The map shall show the location of the stormwater outfalls, receiving waters, and any structural controls. Identify all activities that occur at the facility and the potential pollutants associated with each activity including the location of any floor drains. These may be included as part of the inventory required by part 2.3.7.a.

3. Identification of stormwater controls

The permittee shall select, design, install, and implement the control measures detailed in paragraph iv below to prevent or reduce the discharge of pollutants from the permittee owned facility.

The selection, design, installation, and implementation of the control measures shall be in accordance with good engineering practices and manufacturer's specifications. The permittee shall also take all reasonable steps to control or address the quality of discharges from the site that may not originate at the facility.

If the discharge from the facility is to a water quality limited water and the facility has the potential to discharge the pollutant identified as causing the water quality limitation, the permittee shall identify the control measures that will be used to address this pollutant at the facility so that the discharge does not cause or contribute to a violation of a water quality standard.

4. The SWPPP shall include the following management practices:

- a) Minimize or Prevent Exposure: The permittee shall to the extent practicable either locate materials and activities inside, or protect them with storm-resistant coverings in order to prevent exposure to rain, snow, snowmelt and runoff (although significant enlargement of impervious surface area is not recommended). Materials do not need to be enclosed or covered if stormwater runoff from affected areas will not be discharged directly or indirectly to surface waters or to the MS4 or if discharges are authorized under another NPDES permit.
- b) Good Housekeeping: The permittee shall keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals. Ensure that trash containers are closed when not in use, keep storage areas well swept and free from leaking or damaged containers; and store leaking vehicles needing repair indoors.
- c) Preventative Maintenance: The permittee shall regularly inspect, test, maintain, and repair all equipment and systems to avoid situations that

may result in leaks, spills, and other releases of pollutants in stormwater to receiving waters. Inspections shall occur at a minimum once per quarter.

- d) Spill Prevention and Response: The permittee shall minimize the potential for leaks, spills, and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, the permittee shall have procedures that include:
- Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.
 - Response procedures that include notification of appropriate facility personnel, emergency agencies, and regulatory agencies, and procedures for stopping, containing, and cleaning up leaks, spills and other releases. Measures for cleaning up hazardous material spills or leaks shall be consistent with applicable Resource Conservation and Recovery Act (RCRA) regulations at 40 CFR section 264 and 40 CFR section 265. Employees who may cause, detect, or respond to a spill or leak shall be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the Pollution Prevention Team; and
 - Contact information for individuals and agencies that shall be notified in the event of a leak, spill, or other release. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40 CFR section 110, 40 CFR section 117, or 40 CFR section 302, occurs during a 24-hour period, the permittee shall notify the National Response Center (NRC) at (800) 424-8802 in accordance with the requirements of 40 CFR section 110, 40 CFR section 117, and 40 CFR section 302 as soon as the permittee has knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency, public health or drinking water supply agencies, and owners of public drinking water supplies. Contact information shall be in locations that are readily accessible and available.
- e) Erosion and Sediment Control: The permittee shall use structural and non-structural control measures at the facility to stabilize and contain runoff from exposed areas and to minimize or eliminate onsite erosion and sedimentation. Efforts to achieve this may include the use of flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion.
- f) Management of Runoff: The permittee shall manage stormwater runoff from the facility to prevent or reduce the discharge of pollutants. This may include management practices which divert runoff from areas that

are potential sources of pollutants, contain runoff in such areas, or reuse, infiltrate or treat stormwater to reduce the discharge of pollutants.

- g) Salt Storage Piles or Piles Containing Salt: For storage piles of salt or piles containing salt used for deicing or other purposes (including maintenance of paved surfaces) for which the discharge during precipitation events discharges to the permittee's MS4, any other storm sewer system, or to a Water of the US, the permittee shall prevent exposure of the storage pile to precipitation by enclosing or covering the storage piles. Such piles shall be enclosed or covered within two (2) years of the permit effective date. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. The permittee is encouraged to store piles in such a manner as not to impact surface water resources, ground water resources, recharge areas, and wells.
- h) Employee Training: The permittee shall regularly train employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP (e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team. Training shall cover both the specific components and scope of the SWPPP and the control measures required under this part, including spill response, good housekeeping, material management practices, any best management practice operation and maintenance, etc. EPA recommends annual training.

The permittee shall document the following information for each training:

- The training date, title and training duration;
 - List of municipal attendees;
 - Subjects covered during training
- i) Maintenance of Control Measures: The permittee shall maintain all control measures, required by this permit in effective operating condition. The permittee shall keep documentation onsite that describes procedures and a regular schedule for preventative maintenance of all control measures and discussions of back-up practices in place should a runoff event occur while a control measure is off-line. Nonstructural control measures shall also be diligently maintained (e.g., spill response supplies available, personnel trained).

iii. The permittee shall conduct the following inspections:

1. Site Inspections: Inspect all areas that are exposed to stormwater and all stormwater control measures. Inspections shall be conducted at least once each calendar quarter. More frequent inspections may be required if significant activities are exposed to stormwater. Inspections shall be performed when the facility is in operation. At least one of the quarterly inspections shall occur during a period when a stormwater discharge is occurring.

The permittee shall document the following information for each facility inspection:

- The inspection date and time;
- The name of the inspector;
- Weather information and a description of any discharge occurring at the time of the inspection;
- Identification of any previously unidentified discharges from the site;
- Any control measures needing maintenance or repair;
- Any failed control measures that need replacement.
- Any SWPPP changes required as a result of the inspection.

If during the inspections, or any other time, the permittee identifies control measures that need repair or are not operating effectively, the permittee shall repair or replace them before the next anticipated storm event if possible, or as soon as practicable following that storm event. In the interim, the permittee shall have back-up measures in place.

The permittee shall report the findings from the Site Inspections in the annual report.

- iv. The permittee must keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance, inspections, and training required by part 2.3.7.b. The permittee shall maintain all records associated with the development and implementation of the SWPPP required by this part consistent with the requirements of part 4.2.

3.0. Additional Requirements for Discharges to Surface Drinking Water Supplies and Their Tributaries

- a. Permittees which discharge to public surface drinking water supply sources (Class A and Class B surface waters used for drinking water) or their tributaries should consider these waters a priority in the implementation of the SWMP.
- b. Permittees should provide pretreatment and spill control measures to stormwater discharges to public drinking water supply sources or their tributaries to the extent feasible.
- c. Direct discharges to Class A waters should be avoided to the extent feasible.

4.0. Program Evaluation, Record Keeping, and Reporting

4.1. Program Evaluation

- a. The permittee shall annually self-evaluate its compliance with the terms and conditions of this permit and submit each self-evaluation in the Annual Report. The permittee shall also maintain the annual evaluation documentation as part of the SWMP.
- b. The permittee shall evaluate the appropriateness of the selected BMPs in achieving the objectives of each control measure and the defined measurable goals. Where a BMP is found to be ineffective the permittee shall change BMPs in accordance with the provisions below. In addition, permittees may augment or change BMPs at any time following the provisions below:

- Changes adding (but not subtracting or replacing) components or controls may be made at any time.
- Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be made as long as the basis for the changes is documented in the SWMP by, at a minimum:
 - An analysis of why the BMP is ineffective or infeasible;
 - Expectations on the effectiveness of the replacement BMP; and
 - An analysis of why the replacement BMP is expected to achieve the defined goals of the BMP to be replaced.

The permittee shall indicate BMP modifications along with a brief explanation of the modification in each Annual Report.

- c. EPA or MassDEP may require the permittee to add, modify, repair, replace or change BMPs or other measures described in the annual reports as needed:
- To address impacts to receiving water quality caused or contributed to by discharges from the MS4; or
 - To satisfy conditions of this permit

Any changes requested by EPA or MassDEP will be in writing and will set forth the schedule for the permittee to develop the changes and will offer the permittee the opportunity to propose alternative program changes to meet the objective of the requested modification.

4.2. Record Keeping

- a. The permittee shall keep all records required by this permit for a period of at least five years. EPA may extend this period at any time. Records include information used in the development of any written (hardcopy or electronic) program required by this permit, any monitoring results, copies of reports, records of screening, follow-up and elimination of illicit discharges; maintenance records; inspection records; and data used in the development of the notice of intent, SWMP, SWPPP, and annual reports. This list provides examples of records that should be maintained, but is not all inclusive.
- b. Records other than those required to be included in the annual report, part 4.4, shall be submitted only when requested by the EPA or the MassDEP.
- c. The permittee shall make the records relating to this permit, including the written (hardcopy or electronic) stormwater management program, available to the public. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests. The permittee is encouraged to satisfy this requirement by posting records online.

4.3. Outfall Monitoring Reporting

- a. The permittee shall monitor and sample its outfalls at a minimum through sampling and testing at the frequency and locations required in connection with IDDE screening under part 2.3.4.7.b. and 2.3.4.8.c.ii.2. The monitoring program may also include additional outfall and interconnection monitoring as determined by the permittee in connection with assessment of SWMP effectiveness

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pursuant to part 4.1; evaluation of discharges to water quality limited waters pursuant to part 2.2; assessment of BMP effectiveness pursuant to part 2.2 or 2.3; or otherwise.

- b. The permittee shall document all monitoring results each year in the annual report. The report shall include the date, outfall or interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results of all analyses. The annual report shall include all of this information and data for the current reporting period and for the entire permit period.
- c. The permittee shall also include in the annual report results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period where that data is being used by the permittee to inform permit compliance or program effectiveness. If such monitoring or studies were conducted on behalf of the permittee, or if monitoring or studies conducted by other entities were reported to the permittee, a brief description of the type of information gathered or received shall be included in the annual report(s) covering the time period(s) the information was received.

4.4. Annual Reports

- a. The permittee shall submit annual reports each year of the permit term. The reporting period will be a one year period commencing on the permit effective date, and subsequent anniversaries thereof, except that the first annual report under this permit shall also cover the period from May 1, [year of final permit issuance] to the permit effective date. The annual report is due ninety days from the close of each reporting period.
- b. The annual reports shall contain the following information:
 - i. A self-assessment review of compliance with the permit terms and conditions.
 - ii. An assessment of the appropriateness of the selected BMPs.
 - iii. The status of any plans or activities required by part 2.1 and/ or part 2.2, including:
 - Identification of all discharges determined to be causing or contributing to an exceedance of water quality standards and description of response including all items required by part 2.1.1;
 - For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;
 - For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.
 - iv. An assessment of the progress towards achieving the measurable goals and objectives of each control measure in part 2.3 including:
 - Evaluation of the public education program including a description of the targeted messages for each audience; method of distribution and dates of distribution; methods used to evaluate the program; and any changes to the program.
 - Description of the activities used to promote public participation including documentation of compliance with state public notice regulations.

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- Description of the activities related to implementation of the IDDE program including: status of the map; status and results of the illicit discharge potential ranking and assessment; identification of problem catchments; status of all protocols described in part 2.3.4.(program responsibilities and systematic procedure); number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located; number of illicit discharges removed; gallons of flow removed; identification of tracking indicators and measures of progress based on those indicators; and employee training.
 - Evaluation of the construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.
 - Evaluation of stormwater management for new development and redevelopment including status of ordinance development (2.3.6.a.ii.), review and status of the street design assessment(2.3.6.b.), assessments to barriers to green infrastructure (2.3.6.c), and retrofit inventory status (2.3.6.d.)
 - Status of the O&M Programs required by part 2.3.7.a.
 - Status of SWPPP required by part 2.3.7.b. including inspection results.
 - Any additional reporting requirements in part 3.0.
- v. All outfall screening and monitoring data collected by or on behalf of the permittee during the reporting period and cumulative for the permit term, including but not limited to all data collected pursuant to part 2.3.4. The permittee shall also provide a description of any additional monitoring data received by the permittee during the reporting period.
- vi. Description of activities for the next reporting cycle.
- vii. Description of any changes in identified BMPs or measurable goals.
- viii. Description of activities undertaken by any entity contracted for achieving any measurable goal or implementing any control measure.
- c. Reports shall be submitted to EPA at the following address:

United State Environmental Protection Agency
Stormwater and Construction Permits Section (OEP06-1)
Five Post Office Square, Suite 100
Boston, MA 02109

Massachusetts Department of Environmental Protection
One Winter Street – 5th Floor
Boston, MA 02108
ATTN: Frederick Civian

Or submitted electronically to EPA at the following email address: stormwater.reports@epa.gov. After December 21, 2020 all Annual Reports must be submitted electronically.

5.0. Non-Traditional MS4s

Non-traditional MS4s are MS4s owned and operated by the Commonwealth of Massachusetts, counties or other public agencies within the Commonwealth of Massachusetts, and properties owned and operated by the United States (Federal Facilities) within the Commonwealth of Massachusetts. This part addresses all non-traditional MS4s except MS4s that are owned or operated by transportation agencies, which are addressed in part 6.0 below.

5.1. Requirements for Non-Traditional MS4s

All requirements and conditions of parts 1 – 4 above apply to all Non-traditional MS4s, except as specifically provided below:

5.1.1. Public education

For the purpose of this permit, the audiences for a Non-traditional MS4 include the employees, clients and customers (including students at education MS4s), visitors to the property, tenants, long term contractors and any other contractors working at the facility where the MS4 is located. The permittee may use some of the educational topics included in part 2.3.2.d. as appropriate, or may focus on topics specific to the MS4. The permittee shall document the educational topics for each target audience in the SWMP and annual reports.

5.1.2. Ordinances and regulatory mechanisms

Some Non-traditional MS4s may not have authority to enact an ordinance, by-law, or other regulatory mechanisms. MS4s without the authority to enact an ordinance shall ensure that written policies or procedures are in place to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

5.1.3. Assessment of Regulations

Non-traditional MS4s do not need to meet the requirements of part 2.3.6.c.

5.1.4. New Dischargers

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of “new discharger” under 40 CFR § 122.2: “A new discharger is any building, structure, facility or installation (a) from which there is or may be a ‘discharge of pollutants’ (b) that did not commence the ‘discharge of pollutants’ at a particular ‘site’ prior to August 13, 1979; (c) which is not a ‘new source’; and (d) which never received a finally effective NPDES permit for discharges at that ‘site.’ The term “site” is defined in § 122.2 to mean “the land or water area where any ‘facility or activity’ is physically located or conducted including adjacent land used in connection with the facility or activity.”

Consistent with these definitions, a Non-traditional MS4 is a “new discharger” if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

Any Non-traditional MS4 facility that is a “new discharger” and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water

Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants, is not eligible for coverage under this permit and shall apply for an individual permit.

Any Non-traditional MS4 facility that is a “new discharger” and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate¹⁶. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

6.0 Requirements for MS4s Owned or Operated by Transportation Agencies

This part applies to all MS4s owned or operated by any state or federal transportation agency (except Massachusetts Department of Transportation –MassDOT- Highway Division, which is subject to a separate individual permit). All requirements and conditions of this permit apply with the following exceptions:

6.1 Public education

For the purpose of this permit, the audiences for a transportation agency education program include the general public (users of the roadways), employees, and any contractors working at the location. The permittee may use some of the educational topics included in part 2.3.2.d. as appropriate, or may focus on topics specific to the agency. The permittee shall document the educational topics for each target audience.

6.2 Ordinances and regulatory mechanisms

The transportation agency may not have authority to enact an ordinance, by-law or other regulatory mechanisms. The agency shall ensure that written agency policies or procedures are in place to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

6.3 Assessment of regulations

Non-traditional MS4s do not need to meet the requirements of part 2.3.6.c.

6.4 New Dischargers

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of “new dischargers” under 40 CFR § 122.2: “A new discharger is any building, structure, facility or installation (a) from which there is or may be a ‘discharge of pollutants’ (b) that did not commence the ‘discharge of pollutants’ at a particular ‘site’ prior to August 13, 1979; (c) which is not a ‘new source’; and (d) which never received a finally effective NPDES permit for discharges at that ‘site.’ The term “site” is defined in § 122.2 to mean “the land or water area where any ‘facility or activity’ is physically located or conducted including adjacent land used in connection with the facility or activity.”

¹⁶ Contact MassDEP for guidance on compliance with 314 CMR 4.04

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Consistent with these definitions, a new transportation MS4 is a “new discharger” if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody listed as impaired in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants, is not eligible for coverage under this permit and shall apply for an individual permit.

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate¹⁷. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements. |

¹⁷ Contact MassDEP for guidance on compliance with 314 CMR 4.04

ATTACHMENT 43

<http://water.epa.gov/polwaste/npdes/swbmp/Developing-an-Outreach-Strategy.cfm>

You are here: [Water](#) » [Pollution Prevention & Control](#) » [Permitting \(NPDES\)](#) » [Best Management Practices](#) » Developing an Outreach Strategy

Developing an Outreach Strategy

Minimum Measure: Public Education and Outreach on Stormwater Impacts

Subcategory: Developing Municipal Outreach Programs

Description

Public education and outreach involves using effective mechanisms and programs, guided by a detailed outreach strategy, to engage the public's interest in preventing stormwater pollution. A key factor to consider when developing a strategy is that the public has varying levels of background knowledge of both stormwater management and their role in reducing stormwater pollution. Hence you should take a multi-pronged approach to outreach efforts by (1) generating basic awareness of stormwater pollution, (2) educating at a more sophisticated level using more substantive content, and (3) building on existing recognition of the issue to prompt behavior changes that reduce pollution (or the opportunities for pollution).

The strategy should also specifically address the integration of public outreach with the implementation of other stormwater program management measures (like illicit discharge detection and elimination, construction site runoff control, and post construction-runoff control). This aspect of outreach could involve more substantive education, possibly short training courses, live presentations and slideshows, handbooks, posters with educational content and captioned illustrations, and Web-based training modules, or more websites with photos of good and bad practices.

The value of laying out a comprehensive outreach strategy is that the stormwater program manager can use it to focus the overall public education and outreach portion of their program - recognizing opportunities to leverage other programs or partner with community organizations, and invest in new program efforts for maximum effect.

Operating Plan

When structuring your strategy document, include sections that discuss the purpose and goals of the stormwater management program (specifically the public education and outreach component), background, objectives, and an operating plan of public education and outreach activities. Other elements common to a good strategy include:

- A list of all partners that participated in the strategy
- An executive summary



Sample logo for a stormwater program. A logo helps to promote visibility of stormwater management in the community

- A glossary that includes definitions of any potentially unfamiliar terms and acronyms used in the strategy

To develop an operating plan, take into account these five components (1) [Goals](#) (2) [Target Audiences](#) (3) [Messages](#) (4) [Format and Distribution](#) (5) [Evaluation](#). [Resources](#) are provided below for further treatment of this topic.

Your operating plan should highlight cross-linkages with other stormwater program (minimum measures) goals, showing how outreach is integral to reaching goals to reduce illicit discharges, reduce construction site runoff, and reduce post-construction runoff pollution. For example, in support of the illicit discharge detection and elimination measure, you may develop an educational section of your website that shows the public what an illicit discharge looks like, and supplement it with an online-reporting form and stormwater citizens - complaint hotline. These cross-linkages with other program requirements highlight efficiencies in your overall program, and the value of outreach.

Goals

Multiple goals are common for an outreach strategy. You should match outreach goals with the goals of the overall stormwater program and its environmental and water protection concerns. With specific goals that dovetail with the environmental goals for the affected waterbodies, you can more efficiently spend dollars to reduce the pollution issue. If reducing nutrients in local waterbodies is a concern, outreach goals should address nutrients generated by the public. For example, you could target the public's gardening practices. An example of an outreach goal might be: "Increase residential awareness of nutrient runoff and encourage behaviors that will reduce nutrient pollution in local streams and lakes."



Television Public Service Announcement on better auto care practices around the home

If the stormwater program goal is general water resource protection, you should consider how the public is affected and why they would care, as you develop outreach goals. For example, one goal might be to increase the public's awareness of the connection between protecting their rivers and lakes and improving their quality of life, recreational opportunities, scenic amenities, community value, property value, and public health.

Some other goals should address creating more institutional and community linkages to promote stormwater pollution prevention. For example, other city departments such as Solid Waste, Parks and Recreation, Transportation, or Schools, can help you promote the public's awareness of stormwater.

A business partnership program can create more opportunities for stormwater outreach and visibility and is another example goal. Business partnerships might be an ideal way to promote messages on reducing illicit or illegal discharges. An example is to offer an incentive like listing a business on the stormwater program website as a "Stormwater Partner" if they meet certain criteria, such as educating employees regularly on preventing illegal waste dumping into stormdrains, implementing BMPs, and clearly displaying posters showing how employees and customers can prevent and report illicit discharges and dumping.

Target Audiences

While broad education on stormwater pollution can be helpful, you may want the strategy to identify segments of the population who play decision-making roles in polluting behaviors - such as home-based automobile care and yard work - to ensure that they understand how to change behaviors that are polluting. Other examples of target audiences might be in the commercial sector, such as builders, construction crews, and auto shop workers. Once identified, you should gather more information about them to better understand their behavior motivations and communication patterns. Effort may be well spent on understanding their language of communication, media (e.g., newspapers/radio stations) they commonly use, points in their workflow where they are most likely to engage in polluting behaviors, and where they purchase materials that are likely to end up as pollution (e.g., motor oil, fertilizers). Basic census research on income and educational demographics might be supplemented by feedback from small focus groups of the target audience with whose help you can better understand them. Research can tell you where the audience needs help to overcome barriers that perpetuate polluting behaviors (for example, all pollution prevention messages are in English, but a large section of the audience speaks Spanish.) It is worth getting to know the target audiences specifically to develop outreach messages that both resonate with, and more importantly, reach them.



Using powerful visual images enhances the linkages between residential nutrient runoff and its impact on local waterbodies

To implement other required minimum measures of your program, you will specifically need to reach audiences such as:

- Builders, contractors, and developers working on construction sites;
- Municipal workers who are responsible for landscaping, street-sweeping and other activities; and
- Condominium associations, landscaping companies, and landowners whose lawn and landscape practices can negatively impact stormwater quality.

These audiences need more technical and substantive messages, and you may have to deliver messages to them on-site or at-work, as well as training at monthly staff meetings, morning meetings, in their lunch rooms, in their newsletters, and so on.



Public transportation-ads can help generate general awareness of home-generated water pollution

Messages

Communication is a two-way street. The value of pitching a message that the targeted audience responds to is very important. To do so, use the techniques honed by commercial marketers who effectively get people to believe in, and purchase their product. Incorporate the following points in your message:

- Tell the audience how they will benefit by taking steps to prevent stormwater pollution of their rivers and lakes.
- Address specific action steps that the audience should take to prevent pollution - don't be vague.
- Give the audience incentives to reduce polluting behaviors.
- Use humor.
- Use a variety of media.
- Engage different senses using color and creative design, catchy music and dialog, and great visuals. Visuals and graphics are especially important for audiences who speak different languages.
- Use trusted, recognized, and popular community figures as messengers.

The message may need to be completely different from the goal. For example if the goal is to prevent excess nutrient runoff from lawns in the community, a message like "Reduce runoff pollution from your lawn," is not likely to get the same interest or response as one that emphasizes the benefits of reducing fertilizer application and mowing. For example, "Save time and money! Let your lawn grow taller. It improves the health of the lawn and reduces the fertilizer you need to apply."

Consider short training courses if your message is more substantive and targeted to specific groups. For example, you may need a short training course geared specifically to builders and developers on construction site-practices to control runoff. The training course might be delivered live by stormwater program staff, and complemented by a web-available slideshow, or a poster, or a reference handbook given to construction permittees with illustrative photos and instructive captions showing good and bad practices on construction sites.

All messages should include clear information on where to get additional resources, for example, a stormwater program Web site or a stormwater hotline phone number.

Format and Distribution

You should consider the receiving audience to help determine message formats and plan the distribution. The outreach strategy should ideally employ a variety of complementary formats to help reach diverse audiences. For broad audiences, media such as radio or television, or movie theater slides, might be appropriate. Messages can refer to a website for more information. Example formats for targeted audiences can include:

- Illustrated posters for auto shops, dry-cleaners, and restaurant workers on preventing illegal waste-dumping into stormdrains and better waste disposal practices
- Paper-based educational/curriculum exercise packets for school programs
- Fridge magnets and calendars for home-owners
- Billboards or posters for public transportation users
- Paper inserts for water utility bills
- A kiosk to showcase the program at county fairs, farmers markets, and public gatherings
- A Web-based training module for landscapers and condominium associations on stormwater infrastructure, with an incentive like a "certificate of completion" from your office
- A website with an illustrated section to train the public to recognize illicit discharges and dumping, and faulty or inadequate construction site runoff controls.

You should also take into account partnership opportunities with local agencies and businesses as you plan format and distribution, particularly at the "point-of-sale" for activities that could generate stormdrain pollution. For example, messages on stormdrain pollution prevention could be distributed on yard-waste bags distributed by the municipality or sold at the local hardware store. Partnering with local cinemas, newspapers, local festivals, and local sporting events are all ways you can use the power of public gatherings and media to take messages on stormwater to ever-wider audiences.

A program website is highly recommended. It should provide information for more detailed education on stormwater management, a phone number, and online-form for reporting stormwater issues or instances of pollution. It should address different audiences, such as "homeowners," "kids," or

Public transportation-ads can help generate general awareness of home-generated water pollution. Use a website to give more in-depth information on stormwater pollution.

"businesses" and also address different activities, such as "pet care," and "yard care." It should offer specific actions that the audience can take to reduce pollution.

A website is an ideal format to widely disseminate more detailed public education on stormwater controls at construction sites. On the website you can show pictures of good and bad practices on construction sites, and link to forms for the public to report problems. The website can also show photos of what illegal discharges might look like, and where to report them.

Evaluation

All successful programs incorporate methods of evaluation, to help them see what works and jettison what does not. Evaluation can involve administrative indicators (e.g., were timeframes of planned activities met?), social indicators (e.g., the number of media impressions or the number of people who have been reached by the program), and environmental indicators (e.g., improvements in water quality, or volume of yard waste collected street side). Evaluation can help you allocate resources. For example, stormwater managers can better estimate the time their staff will need for an activity or product or evaluate whether a new staff member needs to be hired. Evaluation will also help justify future funding or if the scope of the activity or product must be expanded or scaled down.

An easy way to evaluate your outreach strategy is to lay out activities and projects in a table that includes time frame, responsible party, resources needed, and evaluation. An example is provided below from "*Getting In Step: A Guide for Conducting Watershed Outreach Campaigns*" [EPA 841-B-03-002].

Sample Operating Plan Matrix

Sample Operating Plan Matrix						
Goal: Increase awareness of residential nutrient runoff and encourage behaviors that will reduce nutrient pollution in local streams and lakes.						
Objective: Post educational posters in Greater Herndon/Carlsle Metropolitan Transit Authority subway stations.						
Activity/Product	Evaluation Indicators	Time Frame/Due Date	Responsible Party	Resources Needed		Status/Comments
Develop 5 posters for 7 subway stations and post them.	<ul style="list-style-type: none"> Number of posters hung Number of hits on county Web site before and after posters are hung Post-project random phone survey to measure impact of posters 	<ul style="list-style-type: none"> Contact subway authority: <i>February 1</i> Develop text/theme for each poster: <i>February 15</i> Develop layout: <i>March 17</i> Send to printer: <i>March 24</i> Hang posters: <i>April 1 (prior to Earth Day)</i> 	Communications director of county Water Division in Public Works Department	Staff time 40 hours	Dollars <ul style="list-style-type: none"> Printing: \$2,000 (\$1,000 to be donated by Trout Unlimited) Subway ad fee: \$300 for 6 months (possibly donated by transit authority) 	Communications director will contact Greater Herndon/Carlsle Metropolitan Transit Authority director to inquire about procedural requirements and whether they might be willing to waive subway fee for 6 months.
Objective: Educate local businesses about proper nutrient management by developing and implementing a speakers bureau.						
Develop slide show, handout materials, and evaluation form	<ul style="list-style-type: none"> Based on evaluation forms collected, how well the materials were received 	<ul style="list-style-type: none"> Develop draft slide show text: <i>January 17</i> Identify appropriate photos: <i>January 17</i> Develop 1-page evaluation form: <i>January 21</i> Submit materials to reviewers: <i>January 22</i> Finalize all materials and make copies: <i>January 31</i> 	Public affairs assistant	Staff time 60 hours	Dollars Handouts: \$10 Name tags: \$5	Try to have a good mix of business types in each presentation.
Conduct three 2-hour presentations	<ul style="list-style-type: none"> Number of attendees at presentations How many presentations were made How many follow-up phone calls were received because of information presented Based on evaluations, whether attendees benefited from the presentations 	<ul style="list-style-type: none"> Make initial calls to businesses to gauge interest: <i>January 10</i> Secure meeting locations: <i>January 20</i> Send invitations: <i>January 27</i> Conduct presentations: <i>February 19-21</i> 	Public affairs assistant to schedule presentations Community liaison to give presentations	Staff time Schedule presentations: 15 hours Presentations: three 2-hour presentations (6 hours)	Dollars Meeting facility (donated by local businesses) Pizza and soft drinks for meeting: \$50	At presentations, look for attendees that could be potential presenters for future presentations.

A sample outreach plan matrix

Resources

[Getting in Step: A Guide for Conducting Watershed Outreach Campaigns \[EPA 841-B-03-002\]](#) (178 pp, 5.35MB, [About PDF](#)).

This guidebook provides some of the tools you will need to develop and implement an effective watershed outreach plan. It can help the stormwater program manager address public perceptions, promote management activities, and inform or motivate stakeholders.

[Nonpoint Source Outreach Digital Toolbox \[EPA-841-C-05-003\]](#).

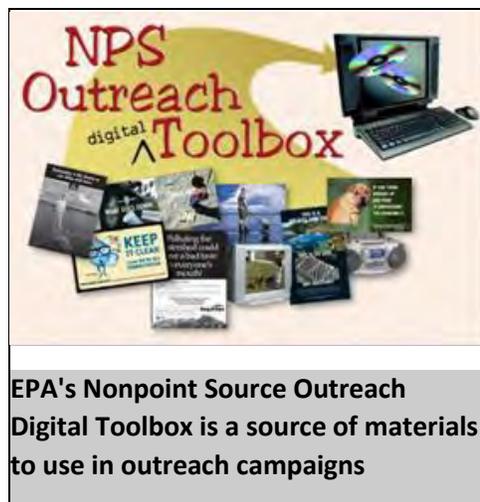
A resource for municipalities for developing outreach campaigns targeted to suburban residential populations, for watershed and stormwater pollution control efforts. The toolbox includes a catalog of over 700 outreach products and media materials.

[Stormwater Outreach Materials and Reference Documents](#). EPA has developed materials available on this site that state or local governments can customize and use in their own stormwater outreach campaigns. Electronic files on this page contain space for officials to add their own contact information and inexpensively reproduce these materials.

References

USEPA. 2003. *Getting in Step: A Guide for Conducting Watershed Outreach Campaigns*. EPA 841-B-03-002. [<http://www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf>] (178 pp, 5.35MB, [About PDF](#)). U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA. National Pollutant Discharge Elimination System. Stormwater Program website [http://cfpub.epa.gov/npdes/home.cfm?program_id=6].



EPA's Nonpoint Source Outreach Digital Toolbox is a source of materials to use in outreach campaigns

ATTACHMENT 44

<http://water.epa.gov/polwaste/npdes/swbmp/Classroom-Education-on-Stormwater.cfm>

You are here: [Water](#) » [Pollution Prevention & Control](#) » [Permitting \(NPDES\)](#) » [Best Management Practices](#)
» Classroom Education on Stormwater

Classroom Education on Stormwater

Minimum Measure: Public Education and Outreach on Stormwater Impacts

Subcategory: Promoting the Stormwater Message

Description

Classroom education plays an integral role in any stormwater pollution outreach program. Providing stormwater education through schools conveys the message not only to students but to their parents. Many municipal stormwater programs partner with educators and experts to develop storm water-related programs for the classroom. These lessons need not be elaborate or expensive to be effective.



Students learn about stormwater pollution (Source: City of Sacramento Stormwater Management Program, no date)

Applicability

The municipality's role is to support a school district's stormwater education efforts, not to dictate what programs and materials the school should use. Municipalities should work with school officials to identify their needs. For example, if the schools request stormwater outreach materials, municipalities can provide a range of educational aids, from simple photocopied handouts, overheads, posters and slide shows, to more costly and elaborate working models and displays. The Daly City (California) Utilities gave a slide show and video presentation of marine animals entangled in plastics to eighth-graders just before their 1998 beach cleanup. Afterward, they had their largest volunteer turnout ever.

Implementation

Building a strong relationship with the school district is the most important step in getting stormwater education into the schools. One of the first questions to ask is what if any stormwater education programs have the schools implemented or would like to see implemented if they had the resources to do so. When developing an outreach message for children, choose the age-ranges to target. Will the focus be on students in preschool, grammar school, middle school, or high school? Should the curricula be grade-level specific? Will the program involve a year-long study, a semester, a special topic or event, or a single presentation by an organization? What special equipment might be needed? For example, the municipality might purchase a small-scale watershed model that can be loaned to schools for demonstrations as part of a watershed education program. The school district's needs and the municipal resources available will determine the answers to these questions.

The State of California's new water quality lesson plans for grades 4-6 feature a campus water runoff study that demonstrates how various pollutants, such as trash, pesticides and motor oil, can travel off school grounds into nearby storm drains en route to our waterways. Students then devise "service learning" projects, such as creating websites, forming campus recycling clubs and conducting

neighborhood canvassing and civic group presentations on water pollution prevention. Developed by the California Water Boards, which regulate water quality matters in the state, the site features 24/7 teacher training via webcast connection and online mentor support. The lesson plans and distance learning tool will be used by Phase I and Phase II NPDES permittees within the state. The site would also prove useful for other permittees nationwide. (See [California Water Board Water Quality Service Learning Program](#) EXIT Disclaimer).

The University of Central Florida has developed the [Stormwater Education Toolkit \(SET\)](#) EXIT Disclaimer, which contains educational information for teachers.

Many additional classroom materials are available for free. Colorado has compiled teacher resources on urban stormwater, (See [Teacher Resources for Introducing Urban Stormwater Quality Concepts to the Classroom](#) [PDF - 132 KB - 19 pp] EXIT Disclaimer).

The city of Eugene's (Oregon) Stormwater Management Program offers a free 13-page booklet listing stormwater videos, classroom presentations, demonstrations, and models available for checkout to Eugene teachers. Guest speakers also are available to give classroom presentations.

The city of Los Angeles's Stormwater Program offers several classroom materials, including a *Special Agent Task Book*, to supplement its EcoTours program (targeting third and fourth graders), the *Clean Water Patrol* coloring book (which teaches children about their urban forest and how neighborhood behavior can affect the environment), and colorful vinyl stickers with clever stormwater sayings, such as "You Otter Not Pollute."

The University of Wisconsin offers educational materials entitled "Educating Young People About Water." These materials can help the user develop a community-based, youth education program that targets youths, links key members of the community, and allows both groups to work together toward common water education goals. Various guides and other educational materials are available from the university. See [Educating Young People About Water](#) EXIT Disclaimer website for more information about these materials and ordering information.

Other programs have created models for display in schools. Sacramento, California's Storm Water Management Program has designed a working stormwater display that identifies the many sources of stormwater runoff. The exhibit features a model of a typical urban community, with stormwater and pollution draining into a creek. Interactive buttons highlight various sources of stormwater pollution occurring within the community. Brief explanations of stormwater pollution accompanying the model help convey the important message that storm water flows directly, untreated, into creeks and rivers. The model is available on a limited basis for loan to schools and other educational programs in the Sacramento area (City of Sacramento, 1999).

San Diego's Environmental Health Coalition (EHC) has developed two excellent environmental programs for the San Diego Regional Household Hazardous Materials Program (SDRHHMP). *Pollution Solutions Start at Home* is an interdisciplinary course for middle and junior high school students. *Household Toxics* is a course for fourth-through sixth-grade students. It teaches the safe use and disposal of household hazardous materials, along with safer alternatives to such products. EHC also produces a Watershed Protection Kit, which includes two learning activity packets, 10 storm drain stencils, and a carrying case

(\$50.00). These materials and others are available through the Environmental Health Coalition, 1717 Kettner, Suite 100, San Diego, CA 92101, 619-235-0281.

Seattle Public Utilities has recently turned its award-winning "Water You Doing" video into an educational CD-ROM for classrooms and libraries. The CD features videos, games, and activities highlighting Seattle's and Puget Sound's water resources. The CD is available at the Environmental Information Center in Seattle's 22 Public Libraries. The CD is free to teachers within Seattle Public Utilities' service area. Outside Seattle, discs are available for a nominal fee to cover the cost of pressing and shipping. Copies can be obtained from Seattle Public Utilities by contacting Richard Gustav at Seattle Public Utilities, 710 Second Ave., 10th floor, Seattle, WA 98104, 206-684-7591.

Home*A*Syst is a program designed to help homeowners and renters understand environmental risks in and around their home. The program guides the public in developing action plans for making voluntary changes to prevent pollution. Additionally, Home*A*Syst helps individuals understand what they can do to help protect the environment, how they can take action, and where they can find the support necessary to act. To accomplish this, the program offers a guide entitled *Home*A*Syst: An Environmental Risk-Assessment Guide for the Home*, which provides in-depth information and comprehensive checklists to help users evaluate environmental risks. The guide is composed of eleven chapters that cover a variety of topics, including stormwater. If children are made aware of this resource, they can encourage their parents to use the program and reduce environmental risks around the home. More information about Home*A*Syst see the [Home*A*Syst](#) EXIT Disclaimer website.

The U.S. Geological Survey (USGS) offers a number of educational resources. Posters are available for teaching students in grades K-12 about wastewater, water quality, groundwater, and water use. The USGS also offers fact sheets, useful links, and an educational outreach program designed to stimulate interest in fresh water resources for students and educators in grades K-12. See [USGS](#) EXIT Disclaimer website for more information.

Similar to USGS, EPA offers a number of educational resources for students and teachers. Schools frequently locate these resources in their environmental education and student "centers." More information about these centers, as well as specific resources found within each, can be found at the USEPA [Kids, Students, and Teachers](#) website. Other free publications are also available at USEPA's [Stormwater Outreach Materials](#) website.

The *Green Teacher* is another educational resource that is useful for educating students. Written by educators, the magazine is designed to help educators enhance environmental and global education across the curriculum for all grade levels. Each issue contains articles, ready-to-use activities, resource listings and reviews, and a number of other resources. See the [Green Teacher](#) EXIT Disclaimer website for more information about the magazine. Other educational resources for K-12 educators are available from the [Water Environment Federation](#) EXIT Disclaimer), ([Project WET](#) EXIT Disclaimer), and a number of other organizations and programs throughout the country.

The Colorado Water Protection Project has created a useful booklet of stormwater information called the ["Colorado Water Protection Kit"](#) (17 pp, 328K, [About PDF](#)) EXIT Disclaimer . The kit contains information on polluted runoff, landscaping, yard and garden products, pet waste, household hazardous waste, motor oil and automotive products, boating and marinas, conservation, and septic systems.

Effectiveness

The effectiveness of stormwater education in the classroom depends on many factors. The lessons and activities must be interesting and fun, and most importantly, they must be targeted to the appropriate age group(s).

Benefits

The benefits of teaching schoolchildren about stormwater issues are plentiful. These children will learn about environmental issues early and will therefore become interested and perhaps involved at earlier ages. Schoolchildren often tell their parents what they learn in school. Therefore, teaching children about stormwater is an effective way to pass environmental awareness to their parents and throughout the entire community.

Limitations

One of the limitations of classroom education is being able to incorporate stormwater issues into the school curricula. With so many subjects to teach, environmental issues might be viewed as less important. Another limitation is the cost of new materials.

Cost

Many classroom education materials can be ordered free of charge or downloaded from the Internet. Stormwater agencies can generally supply information and materials. The cost of producing materials will vary with the scope of efforts. For example, producing classroom packets can cost as little as \$100-\$200, whereas the cost of permanent displays and models can be as high as \$1,000-\$5,000 or more. Make sure to get estimates from individual vendors before preparing the classroom educational materials budget. Work within attainable financial means. If applicable, contact corporations to sponsor the programs or to donate materials.

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ATTACHMENT 45

<http://water.epa.gov/polwaste/npdes/swbmp/Stormwater-Outreach-for-Commercial-Businesses.cfm>

You are here: [Water](#) » [Pollution Prevention & Control](#) » [Permitting \(NPDES\)](#) » [Best Management Practices](#)
» Stormwater Outreach for Commercial Businesses

Stormwater Outreach for Commercial Businesses

Minimum Measure: Public Education and Outreach on Stormwater Impacts

Subcategory: Promoting the Stormwater Message

Description

A successful outreach campaign must tailor its message to a targeted audience. The target audience may be industry or business groups whose activities influence the health of watersheds. Many commercial activities contribute to stormwater pollution (such as vehicle washing, landscape fertilization, and improper hazardous waste disposal). Therefore, it is important to address commercial activities specifically in an outreach strategy and recognize that in most cases incentives must be provided to encourage businesses to change their behavior.

Applicability

There are numerous ways to provide education and outreach for commercial activities. Materials designed for businesses include posters, magnets, calendars, flyers, brochures, and best management practices (BMPs) fact sheets and handbooks.

For example, if the target audience includes restaurants and auto maintenance industries, you might consider developing and distributing educational brochures and posters that outline BMPs that reduce urban runoff volume and pollutant concentration that result from their operations. Several stormwater programs also offer rewards to businesses that participate in a "stormwater business" program and meet specific criteria. Such commercial stormwater pollution prevention programs have been very successful across the nation.

Implementation

Depending on time, financial, and resource constraints, a municipality might wish to target several or all types of commercial activities. Some common practices apply to most industries and can be used in a variety of outreach materials. At all businesses, workers should "know their site," notice where their property's runoff goes, and know where their drain inlets go. Good housekeeping practices are required to keep pollutants out of storm drains. They are especially important if the property drains to the [sanitary sewer](#) or [combined sewer](#). The business should avoid toxic materials as much as possible, store liquids where they cannot be knocked over, and consider the best place to conduct specific activities. For example, it might be better to clean a fleet of company vehicles at a commercial car



Signs can be posted to educate both employees and the public about the impacts of business activities on water quality

wash rather than washing vehicles on the company's property because dirt, grease, and detergents can be treated effectively at car washes (See [Residential Car Washing](#) fact sheet). To help keep rain from washing away pollutants, companies should be advised to keep dumpsters and other containers securely closed; store containers under cover; and cover stockpiled materials such as gravel, wood chips, and building materials (for example, by using plastic sheeting). Businesses should be asked to clean up their sites, but not by washing grit and grime into the storm drainage system. Instead they should pick up litter, sweep areas and dispose of sweepings in the garbage (unless they are hazardous and require special disposal). Businesses should use absorbent materials to absorb oils. The City of Fortworth, Texas has developed a [pollution prevention fact sheet for restaurants](#) EXIT Disclaimer. The City of Golden, Colorado also developed [fact sheets](#) EXIT Disclaimer for many types of businesses .

Some commonly recommended BMPs for commercial activities include:

- Good storage practices (See [Hazardous Materials Storage](#) and [Road Salt Application and Storage](#))
- [Materials Management](#)
- [Residential Car Washing](#)
- [Spill Response and Prevention](#)
- Property maintenance
- Training and education for employees and customers
- [Illegal Dumping Control](#)
- Trucking and shipping/receiving
- Redesigning parking and landscaped areas to include stormwater management features (i.e. [Bioretention \(Rain Gardens\)](#), collection areas for roof runoff, and shared parking)

As an example, if the targeted areas are parking lots and parking garages, one might develop a slogan such as "Clean Lots and Clean Waters." Under this slogan, a colorful booklet could be produced. This booklet might describe proper parking lot cleaning procedures, such as the following:

- Promptly cleaning up vehicle leaks
- Using a rag or absorbent material to properly dispose of automotive fluids
- Regularly sweeping the parking lot and picking up litter
- Avoiding washing down the parking lot unless a mop for spot cleaning is used
- Disposing of the mop water to a sanitary sewer
- Rinsing the parking lot with water only (no soap) after first sweeping it up and cleaning up oil spots with an absorbent, or collecting the soapy rinse water and pumping it to the sanitary sewer

After the booklet has been developed, it can be distributed to local garages and parking lot authorities. The effectiveness of the outreach strategy should be evaluated using [Attitude Surveys](#) or [Volunteer Monitoring](#) at the outlets of or downstream from targeted areas.

Automotive Service Centers and Garages. The solvents, oils, and paints used in automotive garages and service centers can become major storm water pollutants if handled improperly. Consequently, garages are typically targeted for stormwater education campaigns. Outreach materials specifically tailored for the automotive repair industry can be created. The materials can describe how to develop the outreach message and select appropriate materials and provide information regarding distribution of a combination of materials such as posters, which can be hung in the garage, and flyers or brochures, which can be distributed to employees and kept in the shop's office or lobby. Titles should be eye-catching and meaningful to the audience, such as "Keep Your Shop in Tune . . . and Protect the Bay!" or "Is Water Quality Going Down the Drain in Your Garage?"

The following are recommended topics with practices to control waste from auto shop activities:

- Changing automotive fluids (brake fluid, transmission fluid, gear oil, radiator fluids, and air conditioner Freon or refrigerant)
- Working on engines, transmissions, and miscellaneous repairs
- Preventing leaks and spills
- Cleaning up spills
- Identifying and controlling wastewater and discharges
- Fueling vehicles
- Removing and storing batteries
- Cleaning parts
- Metal grinding and finishing
- Storing and disposing of waste
- Selecting and controlling inventory
- Outdoor parking and auto maintenance
- Vehicle washing, engine cleaning, and automotive steam cleaning
- Training and educating employees and customers
- Pretreating water discharged to the sanitary sewer
- Installing a roof over fueling areas or outdoor working areas (to keep stormwater off these surfaces)
- Regrading or repaving outdoor areas
- Recycling spent fluids on-site

Home mechanics. In addition to targeting automotive service facilities, many stormwater programs also provide outreach materials for automotive "do-it-yourselfers." Pamphlets, brochures, and flyers can be used to outline how to properly dispose of used motor oil and other automotive fluids. Contact information for local commercial recyclers of automotive fluids should be included. To target home mechanics specifically, materials can be placed in automotive supply outlets or mailed to members of a mechanics club or subscribers to home mechanic periodicals.

Municipalities should provide incentives for businesses to participate in pollution prevention activities. Participants can be rewarded with technical assistance, promotional items, and public recognition. In

Austin, Texas, "Clean Water Partners" receive banners, T-shirts, and are mentioned in newspapers and newsletters. King County, Washington's "EnviroStars" are promoted through the Green Business Directory, a directory of environmentally friendly businesses distributed to the public.

A municipality can choose to establish a better business program, which provides assistance, incentives, and recognition for businesses that use practices to effectively reduce stormwater pollution. Some programs target all businesses in the community, whereas others focus on a specific industry, such as automotive shops, power washers, and carpet cleaners. [Hawaii's Green Business Program](#) EXIT Disclaimer recognizes businesses that use environmentally-friendly operations. Palo Alto's Clean Bay Business Program offers recognition and promotional advantages to vehicle service facilities that implement certain BMPs (NRDC, 1999).

In Portland, Oregon, the metropolitan Portland public agencies, known as the Pollution Prevention Outreach (P2O) Team created the [Eco-Logical Business Program](#) EXIT Disclaimer to advise automotive shops on ways to manage wastes and reduce environmental impacts. To date, 25 automotive service operations and 8 fleet services have volunteered for this new program and subsequently met certification criteria. These criteria recognize shops that use management practices designed to limit waste creation and prevent releases to the environment through spills or improper disposal. In most cases, these practices go beyond the minimum to comply with environmental regulations. Some automotive shop pollution prevention and environmental protection practices include recycling or reusing automotive fluids and solvents, using less-toxic cleaners and degreasers, and using secondary containment structures to prevent spills. The program provides an incentive for conscientious businesses to go beyond basic compliance expectations and take extra steps to protect the environment. This sets a new standard for the industry and leads to improved environmental protection. The public is notified of these Eco-logical Businesses. Program coordinators hope that recognition as an environmentally friendly business will be a useful marketing tool for the shops, while attracting other businesses to join the program as well.

Benefits

One of the benefits of outreach programs for businesses, as with all outreach programs, is an increase in public awareness about water quality issues. Additionally, because many business practices use materials and chemicals that are harmful to the environment, it is important for municipalities to inform owners, operators, and employees about practices that should be avoided to maintain and improve water quality. Also, businesses that are more aware of environmental issues might be willing to partner with municipalities and sponsor programs and activities that reach a wider audience in the community. The businesses receive advertising in return for donations of materials, personnel, or use of their facilities.

Limitations

Commercial outreach programs do have some limitations. There are many different types of commercial activities, and outreach programs might not be applicable to some of them. Before developing and implementing an outreach program, municipalities should prioritize business types that they think might impair water quality or that might be most receptive to outreach. Because the

measures that the municipality proposes for businesses are voluntary, owners, operators, and employees must be convinced that changing their behavior is valuable and worth their efforts.

Effectiveness

Municipalities can gauge the effectiveness of their outreach program for commercial activities through surveys of employees. The survey can determine if outreach materials and programs have changed business policies or employee behavior. Also, if a municipality has an incentive program that encourages businesses to register to be listed as a better business, the registration process can be used to gather information about which pollution prevention practices are being used at each business. Additionally, the number of registrants can be used to gauge the effectiveness of the advertising campaign for the program.

Cost

The costs associated with developing an outreach campaign for commercial activities depend on the types and quantities of materials produced, the resources needed (for distribution, contacting businesses in person, etc.), and the general scope of the campaign. Photocopying or printing prices can vary widely, depending on the complexity of the brochure, pamphlet, or poster. Municipalities should consider financial constraints when developing outreach materials. Implementing a "Better Business" program will require dedicated labor, database management, and educational information.

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ATTACHMENT 46

<http://water.epa.gov/polwaste/npdes/swbmp/Tailoring-Outreach-Programs-to-Minority-and-Disadvantaged-Communities-and-Children.cfm>

You are here: [Water](#) » [Pollution Prevention & Control](#) » [Permitting \(NPDES\)](#) » [Best Management Practices](#) » Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children

Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children

Minimum Measure: Public Education and Outreach on Stormwater Impacts

Subcategory: Promoting the Stormwater Message

Description

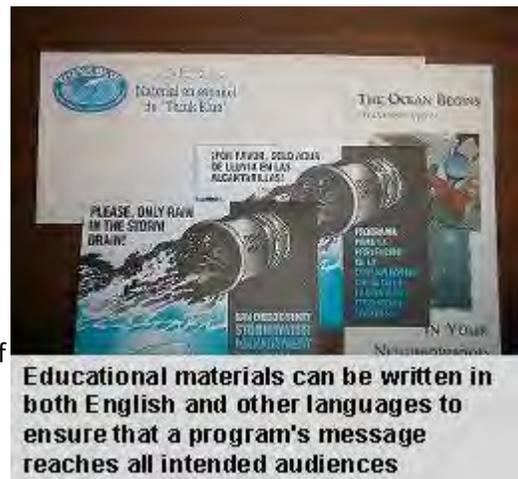
Many residents of ethnically and culturally diverse communities don't speak English. English messages contained in signs, brochures, advertisements, newsletters and other outreach materials are mostly lost on these groups. For example, in areas like southern Florida and southern California, home to large populations of Spanish-speaking immigrants, it is important to engage non-English speaking residents and inform them about the importance of clean water because like any other community, their activities can generate a substantial amount of stormwater pollution. This type of expanded outreach program is not limited to these areas. Census 2000 figures show increasing minority populations in urban centers and suburbs such as Washington, DC (Fernandez, 2001; Cohn and Witt, 2001), and New York (Cohn, 2001), among others.

Communities can also target other groups for outreach activities. Disadvantaged persons may not have the opportunity to learn about or participate in existing programs or activities. Municipal representatives can design and implement education programs in poorer neighborhoods to address the concerns of residents, and they can suggest ways these residents can improve their neighborhood and environment.

Applicability

Municipalities typically know the locations of ethnic and low-income neighborhoods. However, historic boundaries between neighborhoods may not be accurate. It is important for municipalities to survey residents about neighborhood demographics and determine if a specialized campaign is needed in a particular area. A survey can target areas that the municipality deems likely to contain minority and disadvantaged residents. Municipalities can seek assistance from sociology departments at local universities to help with the survey effort, or they can hire a firm specializing in focus groups and polling to conduct the research.

Once minority and disadvantaged groups have been identified, an analysis of the target group should be conducted. This analysis should determine the audience's perception of stormwater issues. Knowing this



helps the municipality tailor the outreach program to the appropriate knowledge base and address specific issues of concern. Tailoring the message will help motivate the groups to participate in the program. For example, does the audience know what a watershed is? Do they understand the causes of polluted runoff? If not, those terms should be defined in the messages.

To more effectively develop, format and distribute environmental messages, it helps to know how the target audience receives its information. Which newspapers, magazines, or newsletters do they read? To what organizations do they belong? Do they watch cable television or local news? Do they listen to community radio programs? Who are their opinion leaders, and how can they be reached?

Implementation

After gathering information on the target audience, a message should be crafted to engage them and help them achieve the objectives of the program. To be effective, the target audience must understand the message. It should appeal to them on their own terms.

Tailoring Programs for Minorities. Stormwater goals are more likely to be met by reaching the largest audience possible. However, smaller target audiences may need to be identified to ensure the message is understood. These smaller audiences include specific age groups, demographics, and nationalities. If the target audience contains a number of minority groups, the outreach strategy should address each individually. Minority group representatives can help develop the outreach strategy. Their insight can help ensure the message conveyed is the message intended.

In bilingual areas, materials should be developed in both English and the local language. Furthermore, care should be taken to ensure that the translation is accurate and the meaning of the message is not lost or changed. A classic example of a marketing mishap occurred when General Motors introduced its Chevy Nova to Latin America. In Spanish "no va" means "it won't go," making the car very unattractive to buyers. Translated into Chinese, Pepsi's catch phrase "Come alive with the Pepsi generation" means "Pepsi brings your ancestors back from the grave." The language of the message should not only be correct but understandable. Scientific jargon should be avoided, and terms associated with the initiative (e.g., stormwater and runoff) should be clearly defined. Graphics should be used to convey the message, rather than text. If text must be used, it should be kept brief, direct, and clear. If the reading level of the audience (especially children) is unknown, the message can be pretested with representatives of the target group to determine its suitability.

Partnering with minority organizations can be the best way to reach a minority audience. Temples, churches, civic organizations, etc. interact with minority communities and understand their perspectives and motivations. They can provide specific information about the target group, and they can serve as an authority through which to channel the message. Organization leaders can be informed about the program's objectives and why it matters to their community. Organizations can announce upcoming events at meetings and services, publish releases in newsletters and notices, and organize presentations. It is important to stress how stormwater pollution prevention affects *them* in particular.

The news media are an important and powerful means of communicating watershed messages to both targeted and broad audiences (See [Using the Media](#) fact sheet.) When a campaign is initiated, minority-focused newspapers, magazines, and television and radio stations in the area should be contacted. The

proper format--whether in English, another language, or both--should be provided. Public service announcements and headlines should be culturally appropriate.

Tailoring Programs for Disadvantaged Communities. The same principles used to target specific audiences can apply to disadvantaged communities. A stormwater pollution message should be specific and tied to community values (such as clean drinking water or clean waters for fishing and recreation). The audience should know what their *direct benefit* will be from getting involved in the issue or modifying their behavior. For example, turning off the water hose when not in use can save them money on their water bill. Messages should be positive. Positive messages tend to be more effective in changing people's habits than negative ones: "Collect your used motor oil" instead of "Don't dump your oil." Other benefits that could be listed include money savings, time savings, convenience, health improvements, and efficiency. The message should focus on making the behavior change requested, the involvement needed, and the support required, user-friendly.

Tailoring Programs for Children. An outreach program can target children in many ways. Perhaps the easiest is through schools and day care centers. Child-targeted materials like posters, flyers and stickers, can be displayed in school libraries and playgrounds. Teachers might be willing to hand-out stormwater materials or organize special events, like stormwater pollution day or stormwater awareness month. Many watershed outreach programs sponsor water festivals that feature games, interactive booths, river and beach cleanups and essay contests. Stormwater pollution programs have often partnered with schools on poster, logo and slogan contests, with the winning entries used in outreach materials. Participants can receive certificates, T-shirts, posters and stickers.

Outreach materials for children should be simple and understandable. Graphics such as photos and mascots can help convey the message. Mascots become familiar faces, with distinct personalities, stories, and lives of their own. Child-friendly mascots can be used in comics, displays, and festivals. They can be featured in calendars, in student lessons and activities, such as skits or puppet shows, and on banners and posters. Interactive materials, like workbooks, "laboratory" experiments, puzzles and games, are especially effective because children learn more by doing than by simply "being told." Many stormwater program websites have added an interactive "kids' page" where children can learn about stormwater pollution by solving puzzles, playing games, and performing experiments on the Internet.

Involving children's organizations in specific, hands-on projects can help spread the message. Approach children's groups to help with stream cleanups, wetland plantings, and volunteer monitoring. Most stormwater programs partner with youth groups during storm drain stenciling projects. Such activities can be incorporated into the group's curriculum. For example, by participating in a storm drain stenciling project, Girl Scouts and Boy Scouts can earn environmental badges.

Community Calendar Gets the Message Out. In 1992, San Diego's Chollas Creek Watershed's Environmental Health Coalition (EHC) mailed a bilingual calendar to every business and home in their target watershed area. Winning entries from a school poster contest provided the art for each month. The English and Spanish calendar contained specific information on the different types of non-point source pollution, and offered tips on how residents could reduce their contribution to water pollution in San Diego Bay. Because a large portion of its target audience was ethnically diverse, the EHC expanded its calendar to include dates of interest to these communities. The calendar noted dates such as Kwanzaa, Boun Soang Heua, and the Chicano Moratorium. The EHC also included dates of activities from neighborhood churches, activity centers, and community groups. The center of the calendar featured a

pull-out of a watershed painting by a renowned local artist. The calendar was printed on recycled paper using soy-based inks.

The calendar's success spawned similar calendars in two states and in Mexico. Though expensive and time-consuming to produce, the calendar provided education on water pollution prevention over an entire year, and represented a gift from the EHC (through their Chollas Creek Project) to the community.

Effectiveness

Targeting specific groups can be effective when municipalities understand the cultural, language, and special needs of such groups. Municipalities can gauge the effectiveness of their targeted outreach programs by monitoring participation in watershed cleanup and other environmental activities. They can survey residents about changes in their behavior resulting from outreach efforts, (See [Attitude Surveys](#), or [Stream Cleanup and Monitoring](#)) and they can examine general environmental conditions (evidence of stormwater pollution, such as trash or motor oil spills) in or downstream from ethnic neighborhoods or low-income areas.

Benefits

Targeting specific audiences, especially if they constitute a large proportion of the population, yield many benefits. If the outreach program is tailored to a specific audience, the participants are more likely to feel that they are an important part of the effort. They can learn specific ways they help create stormwater pollution and how it affects their neighborhood's environment and quality of life. They also learn what they can do to help curb stormwater pollution and improve conditions in their neighborhood.

Limitations

By understanding the cultural issues, language barriers, and specific needs of their ethnic neighborhoods, municipalities can better engage and respond to residents involved in environmental efforts. Research is the key to identifying where target audiences live and how they get their information. The more a municipality knows about their target audience, the better they can use their limited resources to convey their message.

Cost

The cost of targeting specific groups depends on the particular outreach materials and programs that are developed. Public service announcements and other news releases are generally free of charge, but staff time for preparation can be substantial. Costs for outreach materials vary widely, but municipalities can choose a medium appropriate to the available resources.

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ATTACHMENT 47



U.S. ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES)

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BMP Background

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Construction Site Stormwater Runoff Control

Post-Construction Stormwater Management in New Development & Redevelopment

Pollution Prevention/Good Housekeeping for Municipal Operations

Measurable Goals

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Municipal Vehicle and Equipment Washing

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Minimum Measure: Pollution Prevention/Good Housekeeping for Municipal Operations

Subcategory: Municipal Activities

Description

Municipal vehicle washing can generate dry weather runoff contaminated with detergents, oils, grease, and heavy metals. Vehicle washing BMPs can eliminate contaminated wash water discharges to the sanitary sewer system. Such BMPs include installing wash racks that discharge wash water to the sanitary sewer, and contracting the services of commercial car washes, which are permitted to discharge wash water to the sanitary sewer system. Finally, employees and subcontractors should be trained in the municipality's vehicle washing procedures to avoid illicit discharges.

Applicability

Municipalities typically operate a fleet of vehicles, including public works trucks, fire trucks, ambulances, police cars, school buses, and other types of vehicles. Municipalities with a large fleet of vehicles might consider building municipal-operated vehicle washing facilities. Municipalities with small fleets might consider contracting with a commercial car wash. Municipalities that own and operate concrete trucks should look at the [Concrete Washout](#) fact sheet for proper washing procedures. For information on how to educate the public about reducing pollution while washing personal vehicles, see the [Residential Car Washing](#) and [Stormwater Outreach for Commercial Businesses](#) fact sheets.

Siting & Design Considerations

Wash Racks

When installing a wash rack at a municipal facility, several design features should be considered. A designated wash area should be paved and bermed or sloped to contain and direct wash water to a sump connected to the sanitary sewer or to a holding tank, process treatment system, or enclosed recycling system. Note that you must seek the permission of the sewer authority before discharging wastewater to the sanitary sewer, and that special treatment requirements may be placed on such discharges. Alternately, the wash rack could be designed to recycle wash water, thereby eliminating the pretreatment costs of discharging to the sanitary sewer.

The following good housekeeping practices can minimize the risk of contamination from vehicle wash water discharges at municipal facilities (adapted from CASQA, 2003):

- Wash all vehicles in areas designed to collect and hold wash water before its

discharge to the sanitary sewer system. Normally, wastewater treatment regulations require wash water to be pretreated prior to its discharge to the treatment plant.

Contact your sewer authority to ensure that all requirements are met before designing, building, and operating the wash rack.

- Avoid detergents whenever possible. If detergents are necessary, a phosphate-free, non-toxic, biodegradable soap is recommended. Detergents should be avoided if an oil/water separator is used for pretreatment prior to discharge to the sanitary sewer.
- Municipal facilities that store vehicles should stencil their storm drains to remind employees to wash vehicles within the designated wash area. Signage can also be posted with this message.
- Mount spill kits with absorbent containment materials and instructions near wash racks. Immediately contain and treat all spills.

Commercial Car Washes

Municipalities can negotiate with commercial car washes and steam cleaning businesses to handle their fleet vehicle washing. This option eliminates the cost of building and the liability of operating a wash facility. This option may be limited to smaller sized vehicles, however, since many car washes do not have bays large enough to handle buses, fire trucks, ambulances, and other large vehicles.

Other BMPs

If a vehicle must be washed outside of a facility plumbed to the sanitary sewer, take precautions to avoid wash water discharges to the storm drain system. For small jobs, berm the area surrounding the vehicle and use a wet/dry vacuum to capture the wash water for discharge to the sanitary sewer. For larger jobs, use a combination of berms and a vacuum truck, such as those used to clean storm and sanitary sewer systems, to capture and safely dispose of wash water. If detergents are used, clean the pavement to prevent this material from being carried to the storm drain during the next rainstorm.

Maintenance Considerations

A wash rack's paved surfaces and sump should be inspected and cleaned periodically to remove buildups of particulate matter or other pollutants. Plumbing, recycling, and pretreatment systems also require periodic inspection and maintenance. The area surrounding the wash rack should be visually inspected for leaks, overspray, or other signs of ineffective containment due to faulty design or physical damage to berms. Any defects should be corrected.

Limitations

Building a new wash rack can be expensive. Also, for facilities that cannot recycle their wash water, the cost of pretreating wash water prior to discharge to the sanitary sewer can represent a cost limitation. If the appropriate facilities are available, vehicle washing BMPs are relatively inexpensive housekeeping measures.

Effectiveness

Studies have yet to demonstrate the effectiveness of car washing management practices at reducing stormwater pollutant loads.

Cost Considerations

Municipal wash racks plumbed to the sanitary sewer can be expensive to build. They need to be pursued as a capital improvement project or through other measures based on your local policies for such projects. Costs for contracting with commercial car washes can vary depending on the size of the fleet. Rates are subject to negotiation, but they would constitute an annual operating cost that could be included as part of the municipal budget. Other measures to control discharge of incidental washing to the storm drain system (berms, wet/dry vacuums, etc.) are relatively inexpensive.

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Center for Watershed Protection. 1999. On Watershed Behavior. Watershed Protection Techniques 3(3): 671-679.

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Last updated on June 01, 2006

URL: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

ATTACHMENT 48



Stormwater Phase II Final Rule

Public Education and Outreach Minimum Control Measure

Stormwater Phase II Final Rule Fact Sheet Series

Overview

1.0 – Stormwater Phase II Final Rule: An Overview

Small MS4 Program

2.0 – Small MS4 Stormwater Program Overview

2.1 – Who's Covered? Designation and Waivers of Regulated Small MS4s

2.2 – Urbanized Areas: Definition and Description

Minimum Control Measures

2.3 – Public Education and Outreach

2.4 – Public Participation/Involvement

2.5 – Illicit Discharge Detection and Elimination

2.6 – Construction Site Runoff Control

2.7 – Post-Construction Runoff Control

2.8 – Pollution Prevention/Good Housekeeping

2.9 – Permitting and Reporting: The Process and Requirements

2.10 – Federal and State-Operated MS4s: Program Implementation

Construction Program

3.0 – Construction Program Overview

3.1 – Construction Rainfall Erosivity Waiver

Industrial "No Exposure"

4.0 – Conditional No Exposure Exclusion for Industrial Activity

This fact sheet profiles the Public Education and Outreach minimum control measure, one of six measures an operator of a Phase II-regulated small municipal separate storm sewer system (MS4) is required to include in its stormwater management program to meet the conditions of its National Pollutant Discharge Elimination System (NPDES) stormwater permit. This fact sheet outlines the Phase II Final Rule requirements and offers some general guidance on how to satisfy them. It is important to keep in mind that the regulated small MS4 operator has a great deal of flexibility in choosing exactly how to satisfy the minimum control measure requirements.

Why Is Public Education and Outreach Necessary?

An informed and knowledgeable community is crucial to the success of a stormwater management program since it helps to ensure the following:

- **Greater support** for the program as the public gains a greater understanding of the reasons why it is necessary and important. Public support is particularly beneficial when operators of small MS4s attempt to institute new funding initiatives for the program or seek volunteers to help implement the program; and
- **Greater compliance** with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

What Is Required?

To satisfy this minimum control measure, the operator of a regulated small MS4 needs to:

- Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on local waterbodies and the steps that can be taken to reduce stormwater pollution; and
- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Some program implementation approaches, BMPs (i.e., the program actions/activities), and measurable goals are suggested below.

What Are Some Guidelines for Developing and Implementing This Measure?

Three main action areas are important for successful implementation of a public education and outreach program:

① Forming Partnerships

Operators of regulated small MS4s are encouraged to utilize partnerships with other governmental entities to fulfill this minimum control measure's requirements. It is generally more cost-effective to use an existing program, or to develop a new regional or state-wide education program, than to have numerous operators developing their own local programs. Operators also are encouraged to seek assistance from non-governmental organizations (e.g., environmental, civic, and industrial organizations), since many already have educational materials and perform outreach activities.

② Using Educational Materials and Strategies

Operators of regulated small MS4s may use stormwater educational information provided by their State, Tribe, EPA Region, or environmental, public interest, or trade organizations instead of developing their own materials. Operators should strive to make their materials and activities relevant to local situations and issues, and incorporate a variety of strategies to ensure maximum coverage. Some examples include:

- **Brochures or fact sheets** for general public and specific audiences;
- **Recreational guides** to educate groups such as golfers, hikers, paddlers, climbers, fishermen, and campers;
- **Alternative information sources**, such as web sites, bumper stickers, refrigerator magnets, posters for bus and subway stops, and restaurant placemats;
- **A library of educational materials** for community and school groups;
- **Volunteer citizen educators** to staff a **public education task force**;
- **Event participation** with educational displays at home shows and community festivals;
- **Educational programs** for school-age children;
- **Storm drain stenciling** of storm drains with messages such as "Do Not Dump - Drains Directly to Lake;"
- **Stormwater hotlines** for information and for citizen reporting of polluters;
- **Economic incentives** to citizens and businesses (e.g., rebates to homeowners purchasing mulching lawnmowers or biodegradable lawn products); and
- **Tributary signage** to increase public awareness of local water resources.

③ Reaching Diverse Audiences

The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children. Printing posters and brochures in more than one language or posting large warning signs (e.g., cautioning against fishing or swimming) near storm sewer outfalls are methods that can be used to reach audiences less likely to read standard materials. Directing materials or outreach programs toward specific groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts is also recommended. For example, information could be provided to restaurants on the effects of grease clogging storm drains and to auto garages on the effects of dumping used oil into storm drains.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. Finally, they should allow the MS4 to make improvements to its program over each 5-year permit term by providing data on program successes and shortfalls.

EPA has developed a Measurable Goals Guidance for Phase II MS4s that is designed to help program managers comply with the requirement to develop measurable goals. The guidance presents an approach for MS4 operators to develop measurable goals as part of their stormwater management plan. For example, an MS4 could develop a stormwater public education campaign for radio and television. The goal of the campaign might be to increase the number of dog owners who pick up after their pets. To measure the program's progress towards this goal, the program manager might perform a stormwater public awareness survey at the beginning, during, and at the end of the permit term to gauge any change in pet owner behavior over time. As another example, an MS4 might want to encourage "do-it-yourselfers" to recycle used motor oil by establishing and advertising a municipal drop-off center. The MS4 could measure progress toward this goal by tracking the amount of motor oil collected and correlating those data to the timing of public service announcements and other advertisements to see if their message is being received.

For Additional Information

Contacts

- ☞ U.S. EPA Office of Wastewater Management
<http://www.epa.gov/npdes/stormwater>
Phone: 202-564-9545
- ☞ Your NPDES Permitting Authority. Most States and Territories are authorized to administer the NPDES Program, except the following, for which EPA is the permitting authority:
- | | |
|----------------------|--------------------------|
| Alaska | Guam |
| District of Columbia | Johnston Atoll |
| Idaho | Midway and Wake Islands |
| Massachusetts | Northern Mariana Islands |
| New Hampshire | Puerto Rico |
| New Mexico | Trust Territories |
| American Samoa | |
- ☞ A list of names and telephone numbers for each EPA Region and State is located at <http://www.epa.gov/npdes/stormwater> (click on “Contacts”).

Reference Documents

- ☞ EPA’s Stormwater Web Site
<http://www.epa.gov/npdes/stormwater>
- Stormwater Phase II Final Rule Fact Sheet Series
 - Stormwater Phase II Final Rule (64 *FR* 68722)
 - National Menu of Best Management Practices for Stormwater Phase II
 - Measurable Goals Guidance for Phase II Small MS4s
 - Stormwater Case Studies
 - Stormwater Month Materials
 - And many others
- ☞ Getting In Step
<http://www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf>

ATTACHMENT 49



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
WATER SUPPLY AND WATER RESOURCES DIVISION
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EDISON, NJ 08837

OFFICE OF
RESEARCH AND DEVELOPMENT

February 10, 1998

MEMORANDUM

SUBJECT: Guidance Manual for Implementing Municipal Storm Water Management Programs - Volume I - Planning and Administration

FROM: Diana L. Meola, Secretary
Urban Watershed Management Branch

THRU: Daniel Sullivan, P.E., Chief
Urban Watershed Management Branch
Water Supply and Water Resources Division

TO: Gary W. Hudiburgh, Jr., Chief
NPDES Program Branch
Office of Wastewater Management

Enclosed please find three copies of the Guidance Manual for Implementing Municipal Storm Water Management Programs, Volume I - Planning and Administration which were requested.

Please contact me at (732) 321-6635 if I could be of further assistance to you.

Enclosures

GUIDANCE MANUAL FOR IMPLEMENTING MUNICIPAL STORM WATER MANAGEMENT PROGRAMS

Volume I - Planning and Administration

U.S. Environmental Protection Agency
Office of Wastewater Management
Municipal Support Division
Municipal Technology Branch
Washington, D.C. 20460

and

Office of Research and Development
National Risk Management Research Laboratory
Water Supply and Water Resources Division
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CHAPTER 1

INTRODUCTION

INTRODUCTION

Urbanization and industrial activities around the country have significantly altered the natural landscape of our Nation's watersheds. This, in turn, has adversely affected both the quantity and the quality of storm water runoff and has contributed to the chemical, physical, and biological impairment of receiving waters. Studies, such as the Nationwide Urban Runoff Program (NURP) study (EPA 1983), have shown that storm water from urban and industrial areas is commonly contaminated by heavy metals, synthetic organics, pesticides, fuels, waste oils, and pathogens.

Congress, recognizing the importance of controlling these discharges, passed amendments to the Clean Water Act (CWA) in 1987 requiring that the U.S. Environmental Protection Agency (EPA) issue regulations addressing storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. Promulgated on November 16, 1990, the NPDES regulations establish permit application requirements for operators of certain municipal separate storm sewer systems (MS4), as well as of storm water discharges "associated with certain industrial activity." Regulated municipalities include those cities and counties operating medium and large MS4s (serving a population of 100,000 or greater) and other MS4s specifically designated by the permitting authority.

According to CWA mandate, municipalities regulated under the NPDES program must, at a minimum, achieve technology-based requirements (i.e., must reduce pollutant loadings in MS4s to the "maximum extent practicable" [MEP] and must effectively prohibit non-storm water discharges through their MS4s) as a first step toward achieving loading reductions consistent with applicable water quality standards. While MEP was not explicitly defined by Congress, EPA interpreted it to mean that municipalities will develop and implement comprehensive storm water management programs. These programs, proposed by the regulated municipalities under Part 2 of the permit application, are required to address a number of storm water control measures, including methods to detect and remove illicit discharges entering municipal storm sewer systems, as well as appropriate best management practices (BMPs) to address discharges from industrial, commercial, and development activities.

At this time, all regulated Phase I¹ municipalities should have submitted both Parts 1 and 2 of the municipal storm water permit application and will soon begin implementing the storm water management programs they have proposed.

PURPOSE OF THIS MANUAL

The purpose of this manual is to provide practical guidance for municipalities on how to best implement their storm water management programs. As mentioned above, most municipalities have already proposed these programs under Part 2 of the application. Upon approval by the permitting authority, these programs will then be incorporated into the municipality's permit and will serve as the blueprint for the municipality's storm water management activities. Permit conditions, however, cannot specify all the procedures necessary to put storm water management programs into effect. It is suggested that municipalities may need to take steps to ensure that storm water management programs are implemented in a practical, cost-effective manner. As noted throughout this manual, the storm water program is a watershed-based stream protection program. Storm water sources include a host of source categories, many of them associated with residential, commercial, and industrial land uses. This, a host of controls is available for this diverse set of sources. An effective Storm Water Management Program (SWMP) will consider all sources and will provide a framework for establishing control priorities on a holistic, watershed basis.

This manual is intended to help municipalities through this implementation process for their storm water management program. A basic seven-step planning process described in this chapter provides a framework for effective decision-making and long-term planning. Municipalities are encouraged to revisit decisions made during Parts 1 and 2 of the permit application process to reassess their overall planning strategies, selected controls, policies, and programmatic measures. In addition, this manual is intended to help municipalities transform their storm water management program elements from words into action. For example, many municipalities pledged to develop "public outreach programs" to promote awareness about the effects of storm water runoff. But how should such programs be structured? What are the most cost-effective methods for educating community members? What are the advantages of pursuing a public outreach program versus a public participation event? This manual will help municipalities answer such questions and provide guidance on implementing storm water management program activities into the future.

Finally, this manual emphasizes a watershed protection approach, an integrated, holistic strategy for more effectively restoring and protecting aquatic ecosystems and protecting human health. This approach represents a renewed effort by EPA to focus on hydrologically defined drainage basins—watersheds—rather than on areas defined solely by political boundaries. For a given watershed, regulated municipalities are encouraged to consider not only the water resource (e.g., stream, lake, estuary, or aquifer) but all the land from which water drains to that resource. As water drains off the land, it carries with it the effects of human activities throughout the watershed.

¹Pursuant to Section 402(p)(2) of the Clean Water Act, Phase I of the storm water program covers the following: A) a discharge with respect to which a permit has been issued under Section 402 before February 4, 1987. B) a discharge associated with industrial activity, C) a discharge from a municipal separate storm sewer system serving a population of 100,000 or more, and D) a storm water discharge that the administrator or State determines may be contributing to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. Phase II of the storm water program potentially could cover any sources not covered under Phase I. A request for public comment on Phase II targeting and control options appeared in the *Federal Register* on September 9, 1992.

Consequently, to protect water resources, it is important to address the condition of land areas within the watershed. By concentrating on natural resources and systems, it is possible to detect and take remedial action for such problems as declines in living resources and habitat loss, as well as to identify the more commonly recognized problems associated with elevated pollutant concentrations. This manual provides guidance for municipalities to implement their storm water management programs within a watershed protection framework.

INTENDED AUDIENCE

This manual is intended to provide guidance for regulated municipalities as they begin implementing their storm water management programs. Regulated municipalities include cities and counties operating municipal separate storm sewer systems that serve populations of 100,000 or more, as well as certain municipalities specifically designated by the permitting authority. Individuals from a variety of different municipal departments could potentially be involved with program development and implementation and will benefit from reading this manual. Table 1-1 identifies the municipal agencies and personnel who may be involved in implementing the storm water management program. This manual is also intended for use by State and Federal employees assisting municipalities to meet their NPDES storm water program objectives.

TABLE 1-1. AGENCIES AND PERSONNEL INVOLVED IN Storm water MANAGEMENT PROGRAM DEVELOPMENT/IMPLEMENTATION

Municipal Agencies	City/County Personnel	Other Members of Community
Building Department	Council members or other elected officials	Community representatives
City/County Attorney's Office	Emergency response teams	Educators
Department of Environmental Management	Engineers and environmental planners	Environmental advocates
Engineering Department	Financial officers	
Fire Department	Inspectors	
Health Department	Public health officers	
Planning Department	Public outreach personnel	
Police Department	Public works directors	
Public Works Department	Site/building inspectors	
Site Plan Review Department	Site plan reviewers	
Water and Sewer Department	Treatment works operators	
Zoning Department	Zoning board members	

ORGANIZATION OF THIS MANUAL

This manual, organized in a two-volume set, provides specific guidance on how to implement particular aspects of the storm water management program. The manual does not track all requirements of the two-part permit application; rather, it addresses certain elements of the storm water management program (developed under Part 2 of the application) that could be problematic for municipalities to implement, such as illicit detection and removal procedures, public education efforts, and ongoing monitoring programs. Case studies from municipalities around the country have been provided at the end of each chapter. Wherever possible, worksheets, pictures, maps, and charts have been included to help illustrate a particular process.

Chapters, in each volume, are organized as follows:

Volume I: (Planning and Administration)

- **Chapter 1:** Provides an overview of the NPDES storm water program, reviews the topics addressed by the manual, outlines the storm water management program planning process, and examines the relationship between the NPDES program and other urban runoff management programs.
- **Chapter 2:** Helps municipalities establish priorities for storm water management activities to ensure the greatest return on their investment. The chapter also provides methods for ranking problems (i.e., pollutant sources and receiving waters) and appropriate controls.
- **Chapter 3:** Offers hands-on guidance for fulfilling certain administrative requirements, including procedures for developing effective public outreach/public participation programs, financing the storm water management program, and completing required annual reports.
- **Chapter 4:** Provides specific policy guidance on how municipalities may develop effective programs to detect and remove illicit discharges into their MS4s.

Volume II: (Technical Approach)

- **Chapter 5:** Updates guidance on developing sampling and monitoring programs/procedures for the detection of illicit entries into storm water drainage systems;
- **Chapter 6:** Updates information on storage and/or treatment facilities for urban storm water;
- **Chapter 7:** Provides matrices of source control (or nonstructural) and structural BMPs indicating applicability, effectiveness, advantages, and disadvantages of particular controls;
- **Chapter 8:** Compiles guidance on operation and maintenance required for structural BMPs and residuals management practices;
- **Chapter 9:** Develops methodology for evaluating and designing wetland systems for urban storm water pollution control.

DIFFERENCE BETWEEN THIS MANUAL AND OTHER PUBLICATIONS

A number of guidance materials address municipal storm water permit application requirements and urban runoff management as listed in this chapter references, including the following EPA publications:

- *Guidance Manual for the Preparation of Part 1 of the NPDES Permit Application for Discharges From Municipal Separate Storm Sewer Systems* (April 1991). (EPA 1991a)

- *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges From Municipal Separate Storm Sewer Systems* (November 1992). (EPA 1992a)

This manual differs from most of the other publications because rather than focusing on completing municipal permit application requirements, it provides guidance on how to develop and implement a long-term, cost-effective storm water management program. Specifically, this document will help municipalities to set priorities for successful program implementation. While the manual concentrates on NPDES requirements, it also encourages municipalities to consider a broad range of related storm water/watershed management programs (e.g., nonpoint source programs or coastal zone nonpoint pollution control programs). This holistic approach to storm water management provides a framework that allows a municipality to integrate its storm water program effectively with other watershed protection efforts at the local, State, and Federal levels. This manual is part of a family of literature available from EPA, states, and other sources. Where information is already provided in other publications, the manual will direct the reader to those documents.

OVERVIEW OF PART 1 AND PART 2 PERMIT APPLICATION REQUIREMENTS

Before outlining the seven-step planning process of storm water management program development, it is important to review briefly the municipal permit application requirements at 40 CFR (EPA 1991b) Part 122.26(d). The regulations established a two-part application requirement for municipalities operating large or medium MS4s.

Part 1 of the application required municipalities to gather information about existing watershed conditions and storm water management activities. In addition, they were to examine existing legal authorities to enforce their storm water management programs. *Part 1 also required that field screening of major outfalls be conducted to characterize storm water discharges and detect illicit connections in the storm sewer system.* The deadlines for submitting Part 1 permit application for large municipal system (>250,000 population) and medium municipal system (100,000 to 250,000 population) were November 18, 1991 and May 18, 1992, respectively.

Part 2 of the application required municipalities to elaborate on information provided in Part 1. Applicants were to establish adequate legal authority, provide additional information on pollutant sources, collect quantitative data from selected sampling points, and analyze fiscal needs versus available resources. Once existing conditions had been assessed and monitoring data collected, municipalities were required to propose a comprehensive storm water management program. The deadlines for submitting Part 2 permit application for large municipal system and medium municipal system were November 16, 1992 and May 17, 1993, respectively. *Figure 1-1 summarizes the key elements that required for application of Part 1 and Part 2 storm water permit.*

DEVELOPING A WATER MANAGEMENT PROGRAM: THE PLANNING PROCESS

As noted above, this manual delineates a basic seven-step planning process that will help municipalities design cost-effective and sensible storm water management programs. For municipalities that have already completed Parts 1 and 2 of the NPDES municipal permit application, this planning process may suggest ways to improve or enhance the proposed storm water management program. *The flow chart appearing in Figure 1-2 has been developed to give municipalities a sense of how each step in the planning process logically leads to the next and ultimately of how the process feeds back into itself, thereby forming a cycle.*

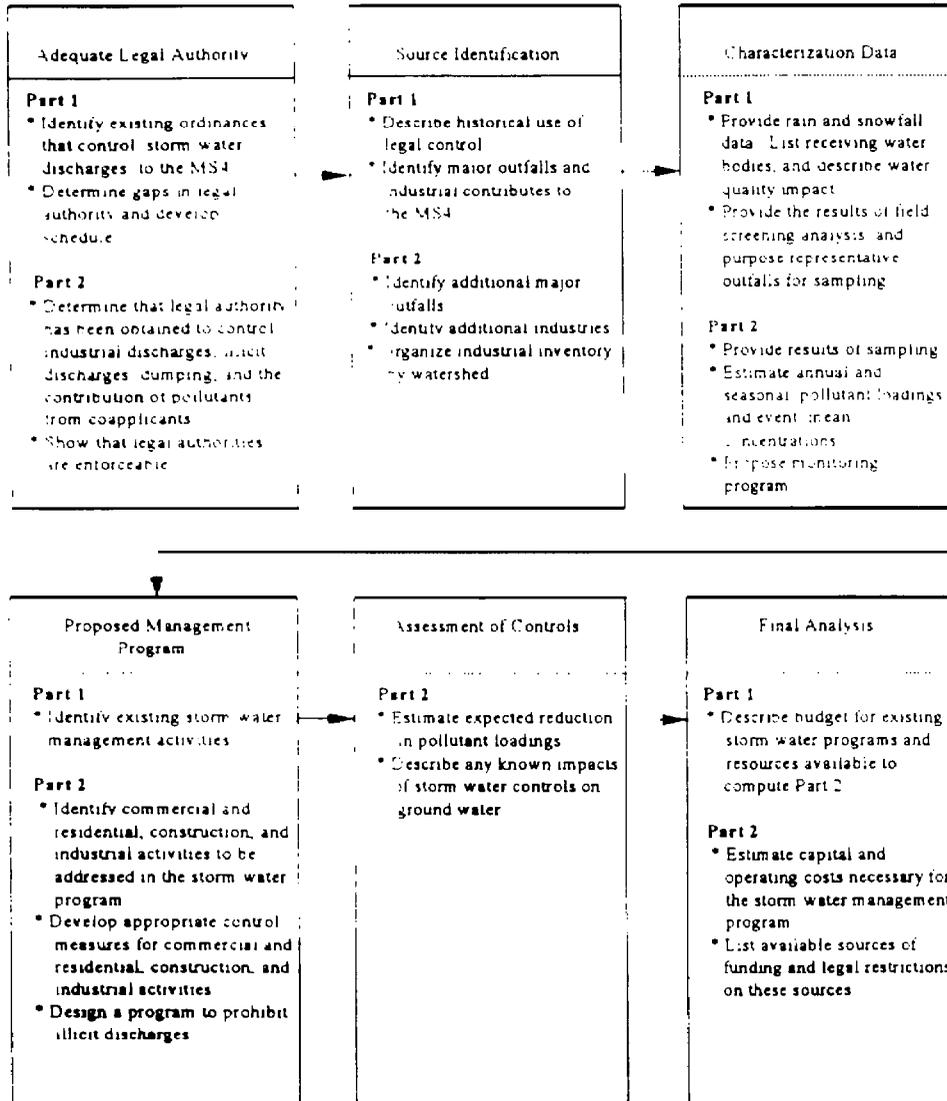


FIGURE 1-1. PART 1 AND PART 2 STORM WATER APPLICATION REQUIREMENTS

After the flow chart, a brief description of each planning step is provided. Other useful guidance materials are listed under the Reference section at the end of this chapter.

- For detailed guidance on Steps 1 and 2 (assessing existing conditions and setting goals), refer to *Guidance Manual for the Preparation of Part 1 of the NPDES Permit Application for Storm water Discharges From Municipal Separate Storm Sewer Systems* (April 1991) and *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Storm water Discharges From Municipal Separate Storm Sewer Systems* (November 1992).
- Steps 3 and 4, which describe methods for ranking pollutants sources and impaired watersheds and for ranking control measures, are addressed in Chapter 2.
- Step 5, which identifies storm water management program administrative requirements, is further discussed in Chapter 3 (guidance for developing public outreach/public participation programs) and Chapter 4 (guidance for developing an illicit detection/removal program).
- Step 6, which addresses data collection programs, is further discussed in Chapter 5.
- Step 7, which addresses evaluating the effectiveness of the program, is elaborated upon at the end of Chapter 3. Other useful guidance materials are listed under the Reference section at the end of this chapter.

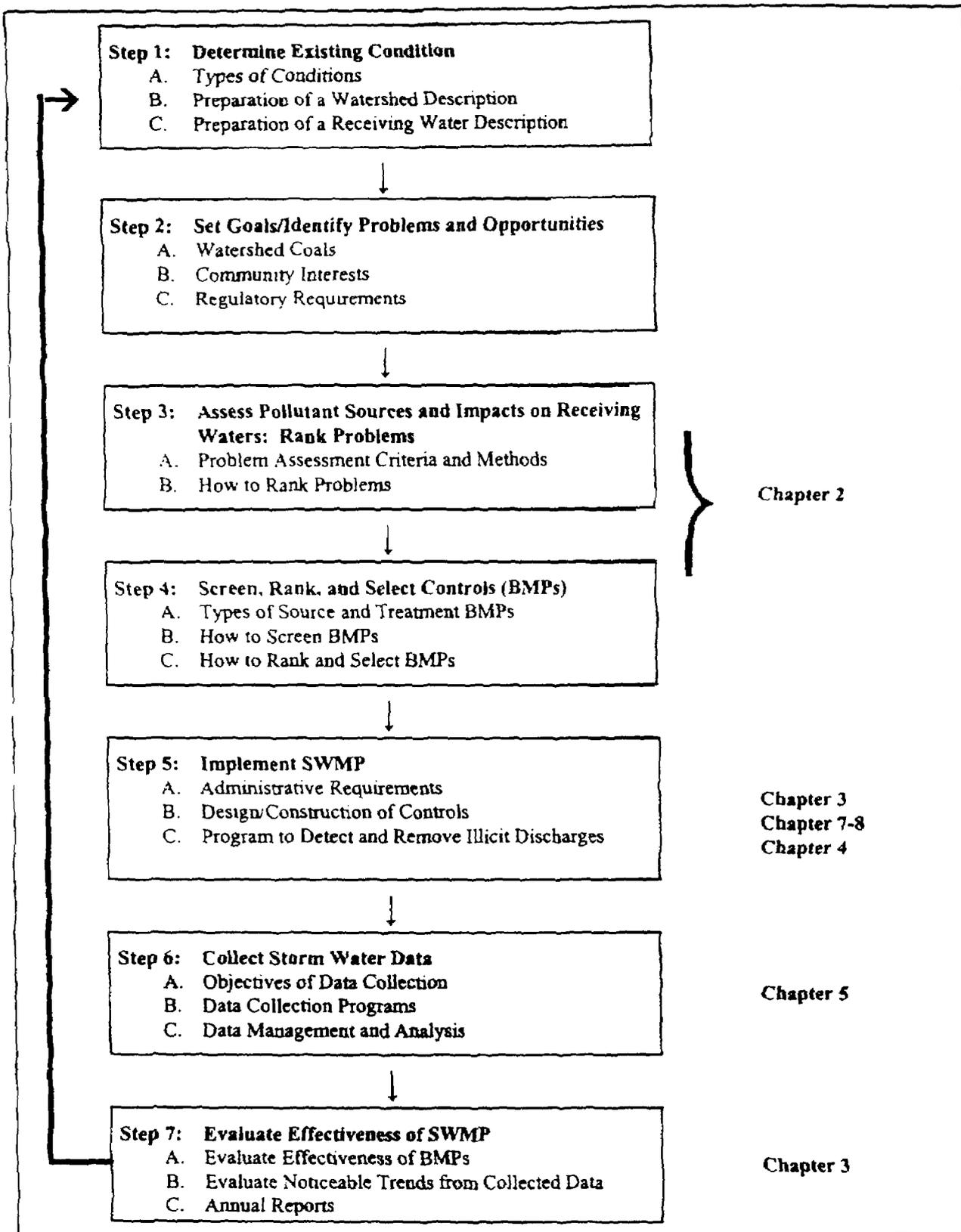


FIGURE 1-2. THE SEVEN STEP STORM WATER MANAGEMENT PROGRAM PLANNING PROCESS

THE SEVEN-STEP STORM WATER MANAGEMENT PROGRAM PLANNING PROCESS

Step 1: Define Existing Conditions

Types of Conditions

The municipality must assess existing water resource conditions to set its initial program goals. Much of this information was collected during Parts 1 and 2 of the municipal permit application. Guidance on how to begin to assess existing conditions may be found in the *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer System*. Existing conditions that should be assessed for the SWMP include those identified below.

Pollutant Sources

Municipalities must identify areas or sources known or suspected to contain significant concentrations of pollutants, including industrial sites (those required to obtain permits under the NPDES program), commercial areas, residential areas, and construction activities. In some cases, these areas of concern may be defined on a categorical basis (e.g., all service stations), while in other cases, the area of concern may be more site-specific (e.g., a particular service station). A significant nonpollutant source of concern is excessively high flow, which results in bank erosion, channel scouring, and sediment deposition.

Receiving Waters

Understanding the characteristics of receiving waters is essential for storm water management program development. Municipalities should evaluate available data on the physical, chemical, and biological conditions of receiving waters—and examine existing uses versus designated uses for particular resources—to determine which waterbodies and which specific areas demand highest priority. A wide range of information should be available from State and Federal agencies and local universities. Similarly, the planning and public works department should have relevant information on receiving waters in its possession.

Watershed Characteristics

In addition to identifying pollutant sources and their impacts on receiving waters, municipalities should assess other aspects of the watershed, such as land use and development patterns (e.g., general program, zoning, subdivision requirements), physical characteristics (e.g., soils, slope, subsurface conditions, climate), and characteristics of the drainage system (e.g., physical storm drain characteristics, base flow characteristics, and water quality objectives). Again, such information should be available from existing sources, including local, State, and Federal agencies.

Institutional Considerations

In Phase I, municipalities have assessed their institutional issues for developing and implementing a storm water management program. However, the items to consider in this phase are funding mechanisms, available staffing, legal authority to carry out storm water management program activities, and the institutional ability in marshalling joint efforts for storm water management among different municipal agencies. Municipalities should consider existing municipal programs that either affect storm water quality (e.g., road maintenance) or that may be expanded to address storm water concerns (e.g., pretreatment, fire inspections).

Community Character

To ensure the political and financial support of SWMP activities, municipalities must work in conjunction with community members to determine what issues are important to them and which programs they would be likely to support. The factors to consider include municipal demographics; types of community organizations; environmental, land use, and aesthetic issues; and the local business climate.

Existing Programs and Controls

Many cities and counties already have programs that, to one degree or another, address storm water management. The SWMP will be more cost-effective if municipalities can incorporate these existing programmatic measures or controls into those now envisioned for an expanded comprehensive SWMP. The existing programs to consider include those that currently manage pollutant sources and those that currently manage other activities of parties responsible for pollutant sources.

Preparation of a Watershed Description

Once municipalities have gathered together available data about sources of pollution and the status of receiving waters, these data need to be organized to facilitate decisionmaking for storm water management activities. As discussed in EPA's Part 2 guidance manual, municipalities are required to prepare a map-based watershed description to obtain a visual sense of the topography in their city drainage areas, locations of industries, and existing control measures and to pinpoint major sources of pollution. Much of the data listed in Table 1-2, which municipalities are required to collect under Parts 1 and 2 of the permit application can be plotted on a base map to form a watershed description.

TABLE 1-2. TYPES OF DATA TYPICALLY INCLUDED IN A WATERSHED PROFILE

Environmental	Potential Sources/Existing Structural Controls
<ul style="list-style-type: none"> • Topography • Land use • Recreational areas (beaches, boating areas) • Designated water uses • Soils and surface/bedrock geology • Vegetation • Natural resources • Temperature • Precipitation • Hydrology 	<ul style="list-style-type: none"> • Landfills • Illicit connections • Waste handling areas • Salt storage facilities • Underground tanks • NPDES industrial activities • Pollution control facilities • Retention/detention ponds • Flood control structures
Infrastructure	Municipal
<ul style="list-style-type: none"> • Roads and highways • Storm drainage systems • Sanitary sewer systems • Treatment facilities • Other utilities (water, electric, gas) 	<ul style="list-style-type: none"> • Population density and projected growth • Zoning • Land ownership • Regulations • Ordinances • Municipal source controls (e.g., street sweeping, catch basin cleaning)

For more information about the sources of watershed mapping and data, as well as methods for analyzing watershed data, refer to *Urban Runoff Pollution Prevention and Control Planning*, EPA 1993a.

Preparation of a Receiving Water Description

In addition to preparing a watershed description, municipalities are encouraged to assess receiving water conditions. Effective identification and use of existing water resources data will reduce the schedule program and cost, in some cases by reducing the need for additional sampling and analysis. Municipalities should work closely with States and Regional EPA offices to obtain available data on receiving waters in various States. States must collect receiving water data as required by CWA § 304(1), 305(b), § 314, and § 319 reports. Data should be available from various local departments (e.g., planning, public works, parks and recreation) as well as State and Federal departments (U.S. EPA, United States Geological Survey [USGS], Fish and Wildlife Service, U.S. Department of Agriculture). In some cases, State and Federal agencies may have conducted intensive surveys of a particular watershed or sub-watershed. Municipalities should contact these agencies prior to initiating any data collection efforts on their own or use field data as an initial screening purpose. In addition, volunteer stream monitoring and survey for field verification of stream conditions will be very valuable to the program. Table 1-3 identifies the data that should be collected to prepare a receiving water description.

**TABLE 1-3. TYPES OF DATA TYPICALLY INCLUDED
IN A RECEIVING WATER PROFILE**

Source Input	Chemical	
<ul style="list-style-type: none"> • CSO data • storm water data • Other NPS data 	<ul style="list-style-type: none"> • Water quality data • Sediment data • Bioconcentration 	
Physical/Hydrologic	Biological	
<ul style="list-style-type: none"> • Physiographic and bathymetric data • Flow characteristics • Tidal elevation in coastal areas • Sediment data 	<ul style="list-style-type: none"> • Fisheries • Benthos data • Biomonitoring data 	
	Water Quality Standards	
		<ul style="list-style-type: none"> • State water quality standards

For more information about the sources of watershed mapping and data, as well as methods for analyzing watershed data, refer to *Urban Runoff Pollution Prevention and Control Planning*, EPA 1993a.

Step 2: Set Goals and Identify Problems and Opportunities:

The primary goal of the Clean Water Act and the NPDES permitting program is to protect the physical, chemical, and biological integrity of our Nation's waters. Toward this end, municipalities are required to develop storm water management programs that will control discharges through their storm sewer systems to the "maximum extent practicable" and to prohibit non-storm water discharges through their MS4s. Within this statutory and regulatory framework, regulated municipalities will define their own set of goals that address all aspects of water quality, including chemical water quality (e.g., toxic substances and conventional pollutants), physical water quality (e.g., temperature, flow, and circulation), habitat quality (e.g., channel morphology, composition, and biotic communities), and biodiversity (e.g., species number and range). Table 1-4 identifies sample goals for a municipal storm water management program.

TABLE 1-4. EXAMPLES OF SPECIFIC WATER QUALITY, ECOLOGICAL, AND RESOURCE MANAGEMENT GOALS

Examples of Water Quality Goals		
Parameter	Goal	Reference
Dissolved Oxygen	At least 1 mg/l at all times throughout the Chesapeake Bay Dissolved oxygen monthly means concentrations of at least 5 mg/l at all times throughout the Chesapeake Bay, with the exception of subpycnocline waters	Part of quantitative criteria established for dissolved oxygen by the Chesapeake Bay Program
Dissolved Oxygen	3.0 mg/l minimum (for other than early life stages) 4.0 mg/l weekly average minimum 5.0 mg/l minimum for early life stages 4.0 mg/l minimum 5.0 mg/l daily average minimum 5.0 mg/l minimum	EPA water quality criteria Virginia standard Pennsylvania criterion District of Columbia standard Maryland standard
Nutrients	Low enough to prevent nuisance growth of algae, weeds, and slimes	Specific objective under the Great Lakes Water Agreement
Solids (settleable and suspended) and Turbidity	Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life	EPA Water Quality Criteria
Mercury	Less than 2.1 ppb/0.025 ppb	Quantitative water quality acute criteria/chronic criteria for priority metal (EPA criteria under development)
Polynuclear Aromatic Hydrocarbons (PAH)	Less than 300 ppb/ND	Preliminary marine water quality criteria under development by EPA
Examples of Living Resource Goals		
Wetlands	No overall net loss	Federal Policy
Wetlands	"...diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands... shall be limited to very incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay..."	Specific objectives set forth in the California Coastal Act
Waterfowl Habitat	Regional land acquisition targets set to meet goals of the Migrating Bird Conservation Act	U.S. Fish and Wildlife Service priority list for land acquisition
Examples of Quality of Life Goals		
Shoreline Access	Substantially expand recreational beach access	So. Carolina's State Comprehensive Outdoor Recreation Program
Park/Recreation Area	Increase urban wildlife programs and public use of opportunities, particularly watchable wildlife programs	U.S. Fish and Wildlife Service "Vision for the Future"

Step 3: Assess Pollution Sources and Their Impacts on Receiving Water; Rank Problems:

Once municipalities have gathered data to determine existing conditions within their jurisdictions, they must determine the most serious problems. During this step, municipalities should consider the following issues: (1) the types of storm water pollution (and their sources) in the watershed, (2) the extent to which these pollution sources affect the water resources, (3) institutional needs and constraints in solving problems, and (4) the degree to which program goals are being met. Finally, municipalities should take steps to rank their problems using the ranking and analysis methods presented in Chapter 2, which provides additional information on this process.

Step 4: Screen, Rank, and Select Controls

After municipalities have ranked and targeted storm water runoff problems (i.e., particular areas, sources, and waterbodies of concern), efforts can then be focused on solving those problems in a cost-effective manner. First, the municipality should compile readily available lists of pollution prevention and treatment practices to assess their relative effectiveness. In most cases, more than one set of BMPs will be identified as feasible to address a particular problem. From the list of feasible alternatives, the municipality will then rank and select its final list of BMPs. Chapter 2 discusses this process of screening, ranking, and finally selecting appropriate BMPs.

Step 5: Implement Storm Water Management Program:

Once priorities have been articulated and a list of BMPs drawn up, the storm water management program team is responsible for moving from planning to implementation as soon as all legal requirements are in place. During this step, near- and long-term program responsibilities must be clearly delineated. All involved persons must be familiar with, and accept their role in, implementing and enforcing the program. Some of the most important aspects of implementing a storm water management program include completing administrative requirements (discussed in Chapter 3), developing a program to detect and remove illicit discharges (discussed in Chapter 4), and knowing exactly when certain BMPs would be effective/appropriate (discussed in Chapter 5).

Step 6: Collect Storm water Quality Data

Although the municipality may already have existing data, additional data will need to be gathered throughout the life of the SWMP. When proposing their monitoring programs under the SWMP, municipalities will have to make important decisions about when, where, and how often to monitor their storm water. Ultimately, the permit writer will establish monitoring conditions for each municipality's permit. Chapter 7 presents detailed guidance for developing municipal in-stream water quality monitoring programs.

Step 7: Evaluate Effectiveness of Storm Water Management Program

The final step, evaluating the effectiveness of the storm water management program, encourages municipalities to reassess decisions previously made and, if necessary, to make alterations in the program plan. As part of this process, the NPDES regulations require that municipalities complete an annual report outlining the effectiveness of their programs on an yearly basis (discussed in Chapter 3).

DISCUSSION OF RELATED REGULATIONS/STATUTES AND PROGRAMS THAT ADDRESS MUNICIPAL STORM WATER RUNOFF

While this manual focuses on providing guidance for NPDES storm water program implementation, municipalities should carefully consider other related watershed protection programs. By integrating these programs into the storm water programs, municipalities will enhance the overall effectiveness of the SWMP. A knowledge of such programs can save startup costs (e.g., by minimizing the need to collect data that may have previously been collected for other purposes) and long-term costs (e.g., by piggybacking BMP planning and implementation activities with other watershed protection efforts). Furthermore, by working in conjunction with other runoff management programs, municipalities can more efficiently address a broad range of watersheds problems concurrently. Listed below (Table 1-5) and identified in the following paragraphs are related Federal statutes, regulations, and programs that address municipal storm water runoff, pollution prevention, and control.

TABLE 1-5. RELATED FEDERAL STATUTES, REGULATIONS, AND PROGRAMS ADDRESSING MUNICIPAL Storm water RUNOFF

- | |
|---|
| <ul style="list-style-type: none"> • Combined Sewer Overflow Policy • Nonpoint Source Program (CWA § 319) • Coastal Zone Nonpoint Source Pollution Control (CZARA § 6217) • Safe Drinking Water Act • Clean Lakes Program (CWA § 314) • 404 Regulations/Wetlands Program • National Estuary Program • Federal Emergency Management Agency Regulations • Pollution Prevention Act of 1990 |
|---|

Combined Sewer Overflow Policy

Combined sewer systems are designed to carry both storm water and sanitary sewage. When wet weather flows exceed the carrying capacity of the system, these combined systems discharge the excess flow through designated overflow points. This event is known as a combined sewer overflow (CSO). Such combined sewer discharges, if not treated before overflowing into receiving waters, can cause significant water resource effects and threaten human health. NPDES permits for CSOs include prohibition of CSOs during dry-weather flow conditions, compliance of all wet-weather CSOs with the technology-based requirements of the CWA and applicable State water quality standards, and minimization of water quality impacts from wet-weather generated overflows.

Relationship to SWMP Implementation

Municipalities that own/operate both storm sewer systems and combined sanitary/storm sewer systems are required to comply with many of the same NPDES permit program requirements, including the following:

- Receiving water quality assessment
- Monitoring
- Public education programs
- Enforcement

(EPA 1994)

Nonpoint Source (NPS) Program (CWA §319)

Under § 319 states perform nonpoint source assessments of navigable waters of the United States. They must identify impaired and threatened waters, the activities causing impairment, and controls and programs necessary to address impairments. In addition, States must develop Nonpoint Source Assessment Reports and Nonpoint Source Management Programs that include an inventory of BMPs, a schedule containing annual milestones for program implementation and certification of adequate legal authority to be eligible for Federal funding. Under this program, many States have also developed State Priority Ranking Systems and undertaken monitoring programs to track progress

Relationship to SWMP Implementation

Program information may be used by municipalities completing their storm water management programs for the following purposes:

- Assessing wetland boundaries
- Assessing the water quality of receiving waters
- Identifying major sources of impairment of receiving waters
- Identifying and implementing effective controls
- Prioritizing implementation of SWMP components
- Identify Total Maximum Daily Loads (TMDLs).

(EPA 1989a and 1990a)

Coastal Zone Nonpoint Source Pollution Control (CZARA § 6217, EPA 1993b)

The Coastal Zone Act Reauthorization Amendments of 1990 require States with existing coastal zone management programs to establish coastal NPS programs that must be approved by the National Oceanic and Atmospheric Administration (NOAA) and U.S. EPA. This program is limited to NPS pollution control in coastal areas and the contribution of inland sources of pollution to degraded coastal water quality. To secure an approved coastal nonpoint program, States are required to do the following:

- Coordinate existing State programs, including State and local water quality plans and programs under § 208, § 303, § 319, and § 320 of the CWA
- Submit State coastal zone boundaries and § 6217 management areas to NOAA for review and modification, if necessary

- Implement State NPS control programs in conformance with management measures defined under CZARA § 6217(g) (referenced below) and additional measures where coastal water quality remains impaired.
- Provide technical and other assistance to local governments and the public for implementing additional management measures
- Provide opportunities for public participation in all aspects of the programs and ensure that there will be administrative coordination among various State, regional, and local agencies
- Develop enforceable policies and mechanisms to implement the Coastal Nonpoint Pollution Control Program.

Relationship to SWMP Implementation

There are many similarities between nonpoint source program goals (under § 319 and CZARA § 6217) and NPDES program goals. Both programs address storm water runoff from areas of industrial activity, as well as new development, pollution prevention, and watershed management. However, these programs target different classes and sources of discharges. For example, municipalities subject to NPDES permit application requirements are not subject to requirements under nonpoint source control programs, including CZARA § 6217; small municipalities (under population 100,000) without NPDES storm water permits are currently covered under CZARA § 6217 and § 314.

The distinction between point and nonpoint source programs becomes more problematic in relationship to industrial activities. While certain industrial activities are covered under the NPDES program (40 CFR 122.26(b)(14)), many other activities fall under the purview of CZARA § 6217. For example, construction activity that disturbs five or more acres or that is part of a larger common program of development or sale is covered under the NPDES program, whereas construction disturbing fewer than five acres is covered under CZARA.

Safe Drinking Water Act

The Surface Water Treatment Rule (SWTR) of the Safe Drinking Water Act (SDWA) outlines requirements for watershed protection of surface drinking water supplies from urban runoff and nonpoint source pollutants. Municipalities using surface waters for drinking water supplies are required by U.S. EPA or the approved State agency to develop a watershed protection program for such surface waters that includes the following: a watershed description, identification of physical watershed characteristics and a description of activities potentially affecting water quality, a program to control pollutant sources (including implementation of appropriate BMPs), and an ongoing program to conduct monitoring.

Relationship to SWMP Implementation

The NPDES storm water management program and the Safe Drinking Water Act have many overlapping requirements, and municipalities are urged to share information between these two programs. Activities common to both include:

- Identifying critical areas and watersheds
- Determining watershed characteristics

- Identifying activities detrimental to surface water quality
- Implementation of control practices to address pollution sources.

(EPA 1986 and 1990b)

Clean Lakes Program

The Clean Lakes Program sets goals for defining the cause and extent of pollution problems in the lakes of each State. Emphasis is placed on developing watershed assessments and effective technology that considers all point and nonpoint sources that affect lake quality.

Relationship to SWMP Implementation

Information developed under this program that may be useful to municipalities implementing SWMPs include:

- Identification of environmental conditions
- Description of the lake's sources of pollution and abatement actions to reduce the pollution caused by these sources
- Monitoring data on receiving waters
- Alternative BMPs for pollution control.

(EPA 1993c)

404 Regulations/Wetlands Program

The Army Corps of Engineers and EPA jointly implement section 404 of the Clean Water Act, which regulates the discharge of dredged and fill material into waters of the United States, including most wetlands, and establishes a permit program to ensure that such discharges comply with environmental requirements.

Relationship to SWMP Implementation

Information available through this regulation may assist the municipality by helping to:

- Identify wetlands and delineate boundaries. (Corps of Engineers Delineation Manual 1987)
- Enforce SWMP restrictions on discharging fill materials
- Develop water quality standards specifically for wetlands.

(EPA 1989b, 1993c, and 1995)

National Estuary Program (NEP)

The National Estuary Program (NEP) focuses on point and nonpoint pollution in geographically targeted, high-priority, estuarine watersheds. Under this program, EPA assists State, regional, and local governments in developing estuary-specific comprehensive conservation and management programs that recommend corrective actions to restore and maintain estuarine water quality and to protect fish populations and other designated uses of these targeted waters.

Relationship to SWMP Implementation

Information obtained under the NEP may be helpful to the municipalities in their efforts to:

- Assess pollutant sources/loadings in particular watersheds
- Monitor trends in receiving water quality
- Implement public outreach elements of the program.

(EPA 1992b)

Federal Emergency Management Agency Regulations (FEMA)

FEMA works closely with local communities to identify flood hazard areas and flooding risks. Flood plain maps are also available through the agency.

Relationship to SWMP Implementation

Municipalities developing storm water management programs may use this information to

- Effectively place structural controls
- Determine floodplains boundaries.

(FEMA 1992 and 1993)

Pollution Prevention Act of 1990

The Pollution Prevention Act of 1990 established a national policy specifying that pollution prevention should be emphasized over pollution control or treatment. With this policy, Congress defined a pollution prevention hierarchy to be followed by all pollution reduction programs:

- Prevent or reduce at the source whenever feasible
- Where prevention is unfeasible, recycle in an environmentally safe manner
- Where prevention or recycling is not feasible, treat in an environmentally safe manner
- As a last resort, dispose of (or otherwise release to the environment) materials in an environmentally safe manner.

Relationship to SWMP Implementation

Management practices set forth in EPA's pollution prevention policy include public education, household hazardous waste collection, location and elimination of illicit connections to separate storm systems, reduction of roadway sanding and salting, and reduction of pesticide, herbicide, and fertilizer use. Many of these measures are required or suggested elements of the storm water management program and can, therefore, be implemented in conjunction with one another.

SUMMARY

Chapter 1 provided an overview of the NPDES storm water program and briefly summarized the remaining chapters. In particular, this chapter introduced the storm water management program planning, a seven-step process that involves establishing goals, collecting data, establishing priorities, and implementing the program. This planning process incorporates the requirements of Parts 1 and 2 of the NPDES municipal storm water permit application. Finally, this chapter examined the relationship between the NPDES program and programs addressing urban runoff management.

Chapter 2 will provide guidance for municipalities as they attempt to establish priorities for storm water management activities. The chapter will describe methods for ranking "problems" (i.e., pollutant sources and receiving waters) and ranking appropriate controls

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CHAPTER 2

ASSESSING STORM WATER RUNOFF PROBLEMS AND DEVELOPING SOLUTIONS: HOW TO SET PRIORITIES

**Step 3: Assess Pollutant Sources and Impacts on Receiving Waters:
Rank Problems**

- A. Problem Assessment Criteria and Methods
- B. How to Rank Problems

Step 4: Screen, Rank, and Select Controls (BMPs)

- A. How to Screen BMPs
- B. How to Rank and Select BMPs

INTRODUCTION

The MPDES regulations require that municipalities develop storm water management programs to control storm sewer system discharges to the maximum extent practicable. In order to develop an effective storm water implementation program, the municipalities should know what their biggest storm water runoff problems are and which solutions are most cost effective.

This chapter¹ is designed to help municipalities answer these questions by identifying sources of information to recognize the existing conditions of a watershed, suggesting ways to identify and prioritize sources of water quality problems, and evaluating the effectiveness of potential control measures. Municipalities have already compiled some of this information as part of the application requirements. However, other watershed information was not included in the applications and will involve additional data collection activities. Using information available on watershed conditions will enable municipalities to set priorities for conducting storm water management activities. As information is gathered and analyzed, a municipality may find it will need to modify SWMP planning and implementation activities. This chapter also emphasizes the use of water quality models to determine this information. However, there are non-computer based methods for determining the benefits and impact of different pollution prevention alternatives.

¹Chapter 2 has been adapted in part from U.S. EPA, Office of Research and Development. *Urban Runoff Pollution Prevention and Control Planning*. September 1993a.

This chapter consists of 3 primary sections. The first section addresses methods for assessing problems and ranking them in order of importance. The second section of the chapter offers methods for evaluating and selecting controls to solve these problems. The criteria used to assess problems (e.g., consideration of public opinion, costs, goals) will often be similar, if not identical, to those used for selecting control measures. The third section includes case studies of municipalities assessing storm water runoff problems and evaluating/selecting and evaluating/selecting appropriate BMPs.

As mentioned in Chapter 1, Steps 1 and 2 (setting goals and assessing existing conditions) are not extensively discussed in this manual because they were covered in the application guidance manuals; *Guidance Manual for the Preparation of Part 1 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems* (April 1991) and *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems* (November 1992a). Readers should refer to these manuals for detail on Steps 1 and 2. This chapter addresses Steps 3 and 4. Step 3, assessing receiving waters and sources of any impaired conditions, is described below. Step 4 is discussed later in this chapter. Step 6, which addresses data collection programs, is discussed in Chapter 5.

STEP 3: ASSESS POLLUTANT SOURCES AND IMPACTS ON RECEIVING WATERS: RANK PROBLEMS

To determine the need for, and appropriate level of, pollution prevention and control measures under their SWMPs, municipalities need to assess and rank existing watershed conditions. To assess watershed conditions, a municipality must gather information concerning the physical, chemical, and biological integrity of the water bodies in its jurisdiction. This type of information can be accessed through numerous sources, including Federal, State, and local sources. Some of these sources are a biennial report (known as the Clean Water Act § 305(b) report) on water quality conditions; the State's listing of impaired water bodies (known as Clean Water Act § 304(1) listings) prepared by the State for submittal to EPA; State Nonpoint Source Assessments (known as Clean Water Act § 319 listings); State Water Quality Assessment (known as Clean Water Act § 314 listings) Fish and Wildlife Service biological surveys; United States Geological Survey (USGS) sources, including maps, water quality and quantity data, and aerial photographs; water quality data compiled by State environmental agencies; Geographic Information System (GIS) data compiled by State or Federal agencies (e.g., EPA, Department of Agriculture, and Department of the Interior); as well as information available by local park departments, health departments, public works departments, and local universities.

Information concerning watershed conditions that may have been collected as part of the application requirements includes the following.

Part 1

- Major outfalls and industrial contributions to the MS4
- Topographic map
- Rain and snowfall data
- List of receiving water bodies, with a description of water quality impacts
- Results of field screening analysis
- Existing storm water management activities.

Part 2

- Runoff sampling results
- Estimate of annual and seasonal pollutant loadings and event mean concentrations
- Estimate of expected reduction in pollutant loadings.

Using the information collected from the sources listed above, a municipality must identify the watershed conditions in its jurisdiction. When identifying the problems, a municipality must consider the chemical, physical, and biological conditions of a water body and determine the degree to which flow volumes and/or associated pollutants led to impaired conditions. For example, when eutrophication occurs in a lake, excess nutrients are of concern. The municipality, in turn, needs to assess the problem, which in this case may be too much fertilizer reaching the water body through runoff. Another example may involve storm water flow resulting in bank erosion and/or changing the strata of the streambed. In large part, the traditional water quality program has focused on chemical impairments. However, in developing a storm water program, municipalities will also need to consider physical and biological impairments.

Once the problems have been identified, they need to be assessed. While many different types of problem assessments may be conducted as part of the storm water management program, to simplify the process this chapter focuses on four major types:

- Resource Assessments: Evaluating the extent to which these pollution sources adversely affect water resources
- Pollutant Source Assessments: Assessing the sources of urban runoff pollution in the watershed
- Institutional Assessments: Assessing existing BMPs, costs, public opinion, and technical feasibility
- Goals and Objectives Assessments: Evaluating whether program goals and objectives are being met.

Municipalities may establish criteria (such as those presented in Table 2-1) for assessing problems. Methods for assessing the problems can also be explored. A discussion of the most commonly used methods of problem assessment is presented under each of the four headings. Finally, methods for ranking problems using both quantitative and qualitative measures are explained.

Once storm water runoff problems have been fully assessed and ordered, municipalities will begin to screen and select BMPs (discussed in the second section of this chapter).

Resource Assess.

The critical element for storm water runoff problems is assessing storm water effects on receiving water quality, physical, chemical, and biological, and determining locations where preventive and corrective measures are needed.

Criteria To Consider

In assessing receiving waters, municipalities should consider the importance or value of a resource (with respect to such issues as aquatic habitat, recreation, and the degree to which a resource is used for public water supplies), the current and desired uses of a resource, and the degree to which resource values are reflected in a State's water quality standards.

TABLE 2-1. CRITERIA FOR ASSESSING POLLUTION PROBLEMS

<p><u>Resource</u></p> <ul style="list-style-type: none"> • Existing use of the affected resource (type, status, and level of use) • Designated use of receiving water • Type and severity of impairment • Relative value of resource affected <p><u>Pollutant Source</u></p> <ul style="list-style-type: none"> • Type of pollutant • Pollutants typically associated with the source • Source magnitude/pollutant loading • Transport mechanisms to water resource (direct pipe, overland flow, or ground water) <p><u>Institutional</u></p> <ul style="list-style-type: none"> • Available resources and technologies • Problems and opportunities • Potential for solving identified problems • Implementability of controls • Applicable and adequate regulations • Multi-agency responsibilities • Costs of controls and program implementation • Funding sources and limitations • Public perception <p><u>Goals and Objectives</u></p> <ul style="list-style-type: none"> • Water resource goals (water use objectives) • Technology-based goals • Land use objectives
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Adapted in part from U.S. EPA, 1987a.

Municipalities should consider the following when evaluating which receiving waters need to be addressed by storm water control activities:

- Extent to which the waterbody is meeting its designated use
- Level of waterbody impairment due to pollution (chemical integrity), loss of aquatic habitat, or riparian or terrestrial area modification (physical integrity)
- Relative value of resource from functional perspective, for instance, for aquatic habitat (biological integrity), recreation, and water supply
- Threat of waterbody impairment, habitat destruction, or terrestrial area destruction if no action is taken (i.e., new impairments are anticipated)
- Feasibility of implementing corrective or protective (e.g., pollution preventative) measures and achieving demonstrable results in the watershed

- Availability of information necessary to target waterbodies and watersheds and to develop and implement effective management strategies.

Methods for Assessing Water Resources and Receiving Waters

Water resource assessments address the effect of storm water flow and associated pollutants on the water bodies of interest. Water resource assessments frequently involve taking the results of the pollutant source assessments described in the following part of this chapter and determining the effect of these pollutant sources on water resources. Water resource assessments may include chemical water quality assessments, as well as aquatic life assessments, sediment quality evaluations, and assessments of any other relevant conditions, such as streambed strata. The methods to perform water quality assessments can range from simple evaluations, involving the comparison of measured concentrations to water quality standards, to detection modeling, to more complex, mathematically based computer models. It is more than likely that sufficient State and local data exist to assess the chemical quality of the waters. It is less likely that local, State, and Federal agencies have data on the physical and biological integrity of the water body of concern. Nonetheless, the municipality should work with the permit writer to access any available information. If necessary, municipal staff, perhaps with the assistance of local universities, can conduct biological assessments. EPA (1989) has issued a valuable guide to biological assessments entitled, *Rapid Bioassessment Protocols for Use in Streams and Rivers* (EPA/444/4-89-001)

Some municipalities may choose to use receiving water models to assess existing water quality conditions and to simulate future conditions of the water resource under various pollution prevention and control scenarios. These models can also be used to differentiate the impacts of sources from one another, thereby enabling the decision maker to make decisions concerning control options. Receiving water models can also be used to assess the impacts of alternative BMPs. These models receive input from runoff model results, field-measured parameters, and the values of parameters found in the literature. The level of complexity of the receiving water model chosen should parallel that of the model used to assess urban runoff flows and loads. Some commonly used receiving water models include the following:

- The Enhanced Stream Water Quality Model (QUAL2E)
- The Water Quality Analysis Simulation Program (WASP4)
- The Exposure Analysis Modeling System II (EXAMSII).

These models are available from U.S. EPA's Center for Exposure Assessment Modeling, Environmental Research Laboratory, in Athens, Georgia. For further information, refer to *Urban Runoff Pollution Prevention and Control Planning*, EPA, 1993a.

Pollutant Source Assessments

Using the Federal, Regional, State, or local sources discussed above, it can be determined which physical and chemical conditions are threatening the water bodies and/or their designated uses. Previous studies on water quality have indicated that certain pollutants are associated with a discrete number of sources. Some of these sources are more easily controlled at a local level than others. For example, controlling runoff from gas stations can be more practically controlled at the local level than can atmospheric deposition.

This section presupposes that municipalities are already aware, or can gain ready access to, information identifying the pollutants of concern. In still other cases, municipalities may be able to anticipate pollutants that may be of concern in the years ahead based on, for example, a knowledge of growth patterns. The purpose of this section is to help municipalities determine which sources they want to control based on impacts to water bodies. In heavily industrialized watersheds, for example, municipalities may want to control industrial sources by using detention ponds to filter runoff. In residential areas, municipalities may want to focus on non-structural measures, such as public education campaigns encouraging used oil recycling. In choosing a source to focus on, municipalities need to consider pollutant loading estimates for storm water runoff and to calculate such estimates on a sub-watershed basis.

Criteria To Consider

To evaluate which sources should be addressed first, municipalities will want to consider the range of pollutant characteristics and sources, the size of each source, the distance between the source and the receiving water, and the mode of pollutant transport. In keeping with the watershed approach, impacts should not be confined to exceedances of chemical criteria. Rather, flow impacts on the physical regime and biological community structure need also be considered. "High-tech" tools useful in evaluating criteria for assessing pollutant sources include GIS and urban runoff models. However, high-tech technologies are not essential to step 3. Hand-drawn maps and desk top calculators can be just as effective in problem assessment and solution identification. The criteria a municipality would consider when determining which sources to address include an estimate of pollutant loadings from the source and an estimated impact of that source on water quality conditions. Sources can be identified in an incremental fashion by targeting areas of the watershed first, then by further focusing on individual sources or source categories (e. g., large parking lots, service stations) within the sub-watershed. Other important criteria to consider include the use of environmental indicators. The discussion below relates the goals of storm water management programs to the use of environmental indicators to meet the goals.

Environmental Goals and Indicators for Storm Water Management Programs

The "seven-step" planning process for storm water management programs must identify both the overall and project-specific environmental goals for the program. Overall environmental goals include those identified in local watershed strategies, basin-wide plans, local ordinances, community local master plans, and State water quality standards, especially the narrative statements. Project-specific goals include specific actions that will be taken to ensure that the environmental goals will be met. Such specific actions can involve pollutant loadings reductions, bank stabilization, elimination of hydraulic disturbances, increasing the effectiveness of buffers, and other common activities. Environmental indicators are used to measure the progress in meeting the overall environmental goals. Tracking of the completion of the project-specific goals must also be done.

EPA has identified four overall environmental goals and specific objectives for the nation's surface and ground waters (Table 2-2). The two ultimate overall environmental goals are to (1) Protect and Enhance Human Health, and (2) Conserve and Enhance Ecosystems. These goals will be achieved by Improving Ambient Conditions and Reducing Pollutant Loadings (Table 2-2). There are a variety of types of indicators to consider which apply to all water management programs, including storm water, traditional point sources, CSOs, and nonpoint sources. A source to assist municipalities in targeting the use of indicators for specific management actions is the *Guidance for Specifying Management Measures for Sources of Non Point Pollution in Coastal Waters* (EPA 1993b). Despite its title, this document broadly addresses specific actions for all types of storm water management in freshwater.

The following discussion provides a summary of the types of indicators available to meet the overall environmental goals and the specific objectives. We are not suggesting that all of these indicators must be measured. Indicators should be selected based upon the overall and specific goals of the project. For example, if contaminated sediment is not suspected to be a problem, then there is no need to routinely sample for sediment toxicity or chemistry. However, sediment toxicity and chemistry may need to be sampled in the future to help diagnose a problem. The Intergovernmental Task Force for Monitoring Water Quality (1995) recommended a core set of parameters be measured in all water management programs followed by more detailed parameters to meet specific needs. Among those core parameters include basic water chemistry and physical measurements (temperature, pH, nutrients, solids), biological community measurements (benthic macro invertebrates, fish, and/or algae), and physical habitat.

TABLE 2-2. EPA's ENVIRONMENTAL GOALS, OBJECTIVES, AND INDICATORS

Environmental Goal	Objective	Indicator Type
Protect and Enhance Public Health	Safe Drinking Water	Meet Public Water Supply Designated Use
	Safe Aquatic Recreation	Beach Closures
		Meet Swimming and Secondary Contact Designated Uses
	Safe Fish and Shellfish Consumption	Tissue Concentrations
Fish Advisories		
Conserve and Enhance Ecosystems	Biologically Healthy Water Resources	Biological Diversity
		Biological Criteria
Improve Ambient Conditions	Ground Water Protection	Ground Water Quality
	Improved Ambient Pollutant Concentrations	Water Quality Standards
		Selected Parameters
	Reduce Contaminated Sediments	Extent of Contaminated Sediment
No Net Loss of Wetlands	Loss or Gain of Wetland Acreage	
Reduce Pollutant Loadings	Reduce Conventional Pollutant Loadings	Water/Effluent Chemistry
	Reduce Toxic Pollutant Loadings	Water/Effluent Chemistry

Human Health Indicators

Indicators for human health protection are fairly straightforward. These would include the measures used by the State to determine whether the designated use for public water supplies are met, as well as the designated uses for swimming and secondary contact use. These would typically include beach closures, if applicable.

Ecosystem Health Indicators

Determining the biological health, or integrity, of the communities inhabiting the surface waters requires more than just chemical and physical sampling. Even toxicological measures usually only account for a portion of the community effects due to other potential impacts such as habitat degradation, cumulative and synergistic effects of toxicants, and the conventional and other non-toxic pollutants. Two categories of indicators should be examined to measure progress towards meeting this goal: biological diversity and biological criteria or condition. Biological diversity measures usually are limited to determining the presence of threatened/endangered or rare species that may appear on State or Federal lists. Consultation with the State regulatory and natural resource agencies, The Nature Conservancy, and the National Biological Survey should reveal whether any "special status" species have been encountered in the area. Correction of storm water impacts could bridge important gaps in the natural range of special status species and reintroduce them into the management area.

Biological criteria, or condition, is monitored and assessed by most State regulatory, or natural resource, agencies. This process requires the collection of at least two assemblages, such as fish and benthic macro invertebrates (and/or algae) and the results are compared with reference conditions developed by sampling least-impacted conditions within specific ecoregions, or by other means available to State biologists. States are working towards adoption of numeric biological criteria into their State water quality standard similar to that done by the State of Ohio, so measurements of the biological health of the waters should be a standard part of the program.

Ambient Condition Indicators

Improvement of ambient conditions can be measured in a number of ways. Table 2-2 shows the types of pollutants that could be monitored associated with various types of storm water management activities. This table summarizes the information in EPA's coastal zone guidance (EPA 1993b), but for more detailed information not in this text, we encourage you to refer to the original document. The traditional approach for determining the improvement in ambient conditions is to compare the receiving water chemistry with State water quality standards or national criteria. However, this does not provide much information for determining the reduction in the extent of contaminated sediments. Conducting sediment toxicity testing is an effective screening tool for determining whether additional sampling and measurement of sediment chemistry is needed.

Pollutant Loading Indicators

This chapter addresses methods for assessing pollutant sources. It is important to document the reductions in pollutant loadings due to management activities to be sure that these activities resulted in measurable progress towards meeting the ultimate environmental goals. The success or failure of these activities can help us learn more about the effectiveness of best management practices.

Methods for Assessing Pollutant Sources

Once criteria have been developed to evaluate pollutant sources—including consideration of the type, magnitude, and transport mode of the pollutants (existing or potential)—the municipality can assess these sources. Pollutant assessments are frequently aimed at quantifying the source flows and pollutant loads under various conditions. Many municipalities may have already completed this step under their municipal permit application. Described below is one widely used assessment method for pollutant source.

Source Determination and Data Evaluation

Urban runoff pollution sources can be defined by completing a comprehensive watershed description that includes the following: the type(s) of pollution affecting a water resource, the pollutant transport mechanisms, the characteristics of drainage patterns and drainage structures, and the land uses in the program area. (Refer to Chapter 1 and the EPA Part 2 NPDES Guidance Manual.)

Those activities or land uses within a watershed that are causing pollution problems need to be identified. Both point source and nonpoint source discharges should be considered. Pollutant types found in the watershed can provide some clues regarding the source(s) of the problems. To isolate sources of pollution, it is helpful to divide the watershed into smaller areas so that individual pollution sources can be identified. Depending on the size of the watershed, a drainage basin can first be divided into subbasins. If necessary, subbasins can then be divided into individual tributaries, pipe systems, or drainage channels. Table 2-3 lists pollutant types typically associated with certain activities or land uses. This information can be used to identify potential sources. Problem sources can also be identified according to water resource conditions, such as eutrophication of a water body resulting from excessive nutrients, or closures of shellfish beds because of high concentrations of bacteria. In addition, sediments from aquatic systems and storm sewers can provide useful information for tracing and identifying potential sources.

Computer modeling is valuable in estimation the flows and loads of pollutant sources needed for pollution source assessments. Available models range from simple screening tools to numerical models with varying levels of complexity based on the number of processes incorporated and the level of detail provided. The level of application of a given model may also vary depending on the objectives of the analysis and available resources. Municipalities must keep in mind that modeling can be quite expensive and should only be used when the potential benefits justify their use.

In addition to the magnitude of a pollutant load and the location of a pollution source with respect to its receiving waters, the mode of transport to the receiving water and the degradation of the pollutant should also be considered. Sources with a clear path to a waterway, such as pipes, ditches, and gullies, often cause more adverse effects in a receiving water than similar sources that must travel through natural filters, such as forested or grassy areas, before entering a surface water body. Changes in loads, from the initial source discharge to the point where they affect the receptor, occur because of such factors as travel time, dilution, pollutant availability, and decay. The fate and transport of pollutants can be modeled using hydrologic and pollutant buildup-washoff models that account for these factors. The more simple modeling methods (i.e., unit load or statistical) can only empirically estimate these factors, and, thus, the level of uncertainty and error is likely to be higher.

TABLE 2-3. TYPES OF ACTIVITIES AND ASSOCIATED POLLUTANTS

Categories and Subcategories	Nutrients	pH	Sediment	Organic Enrichment	Bacteria	Toxic Organics	Toxic Metals	Oil and Grease	Salts (TDS)	Hydrologic Alterations	Thermal Alterations	Pesticides
Agriculture												
Cropland	/		/		/							/
Pasture Land Animal Holding Areas Animal Waste Storage Areas	/		/	/	/							
Hayland	/			/	/							/
Wash & Processing Water	/	/	/	/	/			/				/
Waste Application Areas	/		/	/	/		/					
Construction												
Highways Bridges, Roads	/		/		/	/		/	/	/	/	/
Land Development	/		/		/			/		/	/	
Urban Land												
Storm Water, Sewers, Combined Sewers, Surface Runoff-Pavement	/		/	/	/	/	/	/	/	/	/	
Surface Runoff Turf Areas	/		/		/					/		/
Infiltration Wells & Basins	/				/	/	/	/	/	/		
Land Disposal												
Wastes-Sludge- Septage	/	/	/	/	/	/	/	/	/			/
Landfills	/	/	/	/	/	/	/	/	/	/	/	/
In-Situ Wastewater System	/				/	/	/	/				/
Hazardous Waste Areas	/	/			/	/	/	/	/			/

TABLE 2-3. TYPES OF ACTIVITIES AND ASSOCIATED POLLUTANTS (Continued)

Categories and Subcategories	Nutrients	pH	Sediment	Organic Enrichment	Bacteria	Toxic Organics	Toxic Metals	Oil and Grease	Salts (TDS)	Hydrologic Alterations	Thermal Alterations	Pesticides
Hydrologic Modifications												
Earth Fills, Channelization			/							/	/	
Dam Construction/ Reconstruction	/	/	/	/						/	/	
Other Sources												
Atmospheric Deposition	/	/				/	/					/
Underground Storage Tank Leaks						/	/	/				/
Illegal Disposals/ Dumping Release of Contaminants from in-place deposits	/	/	/	/	/	/	/	/	/			/
Highway/Bridge Maintenance	/		/			/	/	/	/			/
Auto Salvage			/			/	/	/				
Washing & Processing Areas	/	/	/	/	/	/	/	/	/		/	/
Snow Dumping Areas	/		/	/	/	/	/	/	/			
Utility ROWS			/							/	/	/
Surface Runoff from Gasoline Station						/	/	/				
In place sediments	/	/	/	/	/	/	/	/	/			/
Sewer System Leaks, Domestic	/			/	/	/	/					
Wild Birds and Mammals	/			/	/	/	/					
Natural Vegetation (Leaves, Fallen Trees)	/	/	/	/						/		
Manns & Boat Moorings, Boat Maintenance & Boat Washing	/		/	/	/	/	/	/				

Source: Morehouse 1988

Models available for urban runoff assessments vary widely in their levels of complexity, ranging from simple estimation techniques to sophisticated and expensive computer models. Simple methods are compilations of expert judgement and empirical relationships between physiological characteristics of the watershed and pollutant export that can be solved by a spreadsheet program or hand-held calculator. These methods are often used when data limitations, budget, and time constraints preclude the use of more detailed models. Simple models frequently include information on land use, percent impervious factors, runoff coefficients, size of the drainage area, pollutant loading values, and rainfall data. The Federal Highway Administration (FHWA) has made great strides in researching pollutant loadings from highway storm water discharges. FHWA has a number of models and statistical methods that municipalities may find useful in determining the benefits and impacts of various pollution prevention alternatives.

Mid-range models, on the other hand, attempt to compromise between the empiricism of the simpler methods and the complexity of detailed models. Detailed models use storm event or continuous simulation to develop historic time series of storm water runoff and pollutant loadings and concentrations. These models often consider, among other factors, soil type and percent imperviousness factors. To select the model that will best achieve the project objectives, analysts need to consider the available required input data, watershed pollutant characteristics, and time and resources available (*Compendium of Watershed-Scale Models for TMDL Development*, June 1992b).

Several models are available from EPA's Center for Exposure Assessment Modeling in Athens, GA. For more detailed information on urban and nonurban models, refer to the following publications:

- U.S. EPA, Office of Water. *Compendium of Watershed-Scale Models for TMDL Development*. EPA841-R-92-002. June 1992.
- U.S. EPA, Office of Research and Development. *Urban Runoff Pollution Prevention Planning and Development*. EPA/625/R-93/004. March 1993.
- U.S. EPA. *Guide to Nonpoint Source Pollution Control*. 1987b.

Example Models

The following discussion highlights a number of commonly used methods and focuses on models used to predict pollution characteristics in an urban environment. The methods include constant concentration or unit load estimates, preliminary screening procedure, statistical method, rating curve or regression approaches, and hydrologic and pollutant buildup-washoff models.

Constant Event Mean Concentration or Unit Load Estimates

Constant event mean concentrations or unit pollutant loads can be used to estimate pollutant source loads. They can be obtained from available data or estimated according to the types and sizes of land uses in the watershed. Constant event mean concentrations can be coupled with runoff volume estimates to calculate runoff loads or can be used in hydrologic models to calculate time variable flows and loads. Freeman (1995), for example, estimated pollutant loads by using rating curve relationships (including runoff volume), event mean concentrations, and loading/washoff parameters for specific watersheds, land uses, and time of the years. The constant event mean concentration or unit load method is easy to use and can be helpful in identifying which areas within a watershed contribute the largest pollutant loads. Constant event mean concentrations or unit loads can also be estimated using a spreadsheet. Where local resources allow, these calculations can be facilitated using a GIS to keep track of such information as pollutant concentrations from different sources, land use or source boundaries, and quantities of flow produced in individual

Where actual measurements are not available, input data can be taken from the literature. For example, the U.S. EPA's Nationwide Urban Runoff Program provides a comprehensive study of storm water runoff from residential, commercial, and light industrial areas throughout the United States and contains a large data base of pollutant concentrations and loads measured during various storm events from 1978 through 1983 (U.S. EPA, *Results of the Nationwide Urban Runoff Program*, 1983). The Metropolitan Washington Council of Governments has published a manual entitled *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs* (1987). It recommends a simple method for calculating pollutant export from urban development sites. Included in this manual are recommended concentration values for phosphorus, nitrogen, COD, BOD₅, lead, zinc, and copper from new suburban sites, older urban areas, and a central business district.

Other data bases of storm water pollutant concentrations and loads include Driver and Tasker (1990), Tasker and Driver (1988). These data can be used as inputs to source load estimation techniques, such as the constant concentration or unit load method.

Preliminary Screening Procedure

Simple equations can be used to estimate annual average loading contributions of urban runoff for BOD, suspended solids, volatile solids, total phosphate phosphorus, and total nitrogen. Pollutant loadings can be estimated based on the relative contribution of pollutants from each land use; however, the equations are not location-specific and are only useful for screening purposes.

Statistical Method

The statistical method of modeling urban runoff assumes that event mean concentrations (EMC) are distributed log-normally and characterizes EMCs by their median values and their coefficients of variation. The U.S. EPA's statistical method (Driscoll et al., 1989) includes statistical properties of rainfall, area, runoff coefficients, median EMCs, and coefficient of variation of EMCs of various pollutants. The FHWA has implemented U.S. EPA's statistical method at various locations in the United States (Driscoll et al., 1989, and Woodward-Clyde Consultants, 1990).

Regression-Rating Curve Approaches

Rating curve or regression models, such as the 31 storm-runoff-load models developed by the USGS for metropolitan areas throughout the United States (Driver and Tasker, 1990, and Tasker and Driver, 1988), use site-specific rainfall, runoff, and water quality data, such as the data collected for U.S. EPA's Nationwide Urban Runoff Program and similar studies, to relate concentrations and loads of pollutants to flow rates and volumes (see Driver and Tasker, 1990).

Hydrologic and Pollutant Buildup-Washoff Models

Hydrologic and pollutant buildup-washoff models address the accumulation of pollutants during dry-weather periods and runoff of these pollutants during rainfall events. Of the many models available, some of the more widely used models that use a buildup-washoff mechanism include:

- Hydrological Simulation Program-Fortran (HSPF) (U.S. EPA, 1982); also described in (U.S. EPA 1991)

- Storm Water Management Model (SWMM) (U.S. EPA, 1988); also described in (U.S. EPA 1993)
- Source Loading and Management Model (SLAMM) (Pitt, 1989).

Institutional Assessments

In ranking urban runoff related problems, it is also essential to assess institutional constraints/capabilities for the regulators, owners, and the public.

Criteria To Consider

To assess institutional constraints/capabilities, municipalities may want to consider the following: applicable regulations, preferences of the local authorities and regulatory agencies, funding sources and limitations, multi-agency responsibilities and overlaps, and public acceptance of the program. The criteria a municipality would consider when considering which sources to target or which receiving waters to address include:

- Potential for solving the identified problem
- Degree to which existing resources, technology, or (municipal, State, Federal) programs could be used
- Potential for adverse effects due to a particular action
- Willingness of municipal agencies to take steps (use their tools and resources) to help address this problem
- Potential for combined action (involving government agencies, citizens, interest groups, or nongovernmental organizations) in conducting storm water management activities
- Extent to which there are existing programs/activities to support measures required under the SWMP
- Implementability of controls in a particular area
- Level of public support for a) protecting a given resource, b) developing a particular program measure, or c) funding recommended controls
- Availability of funds to undertake a particular project
- Extent to which regulatory/permit requirements are satisfied.

Methods for Assessing Institutional Constraints/Capabilities

The institutional issues of a program are assessed by evaluating the program's potential and limitations and by reviewing the requirements of involved agencies and the public. One major institutional issue that must be addressed by an urban runoff program is determining the responsibilities of each involved party. This is especially true for programs involving multiple agencies. Interviews and meetings with all interested parties can be conducted to help

develop institutional criteria. Questionnaires can be prepared and distributed to help identify concerns. Complaints, either filed with local authorities or available through public interaction programs, can help develop urban runoff pollution prevention and control programs to be implemented later.

Issues related to the control of the program, such as enforcement, permitting, maintenance, and funding, can affect the program's emphasis and the selection of its corrective measures. For permitting and enforcement, the storm water permit program is a two-phase program under section 402 (p) of CWA, 1987. Under Phase I of the National Pollutant Discharge Elimination System (NPDES) program, EPA published a permit application regulation on November 16, 1990, establishing permit application requirements for municipal separate sewers serving large or medium-sized populations (greater than 250000 or 100000 people, respectively) and for storm water discharges associated with industrial activity. Under Phase II, EPA prepared two reports to assess remaining storm water discharges; determine the nature and extent of pollutants in such discharges; and establish procedures and methods to control the storm water discharges. Then, EPA issued regulations that designated storm water discharges, in addition to those described in Phase I, to be regulated to protect water quality and established a program to regulate those designated sources.

Maintenance of storm water management facilities is an important part of storm water management programs. Effective long term performance of a storm water management practice relies heavily on its routine inspection and adequate maintenance. For examples, greater 50 % of infiltration trenches fail after five years due to poor maintenance and clogging of the trenches, and dry detentions lose their flood control and removal abilities due to excessive weed growth and debris accumulation (Yu 1993 and Botts et al. 1996). These BMPs will perform better if pretreatment devices and routine cleaning are conducted.

Financing a storm water management plan is a challenge for local governments. The U.S. EPA's Environment Financial Advisory Board (EFAB) and Environmental Financial Network (EFIN) are available sources for creating a financing strategy for implementing comprehensive conservation and management plans (Henkin and Mayer 1996). The U.S. EPA State Resolving Fund provides loans to local governments for financing surface water related infrastructure projects with 0 % interest rate and could cover 100 % of eligible costs (Singelis 1996). In New Jersey, funding for CSO projects is provided through a grants and low-interest construction loan program jointly administered by the New Jersey Department of Environmental Protection and the New Jersey Wastewater Treatment Trust (Binder 1996).

Another institutional issue involves the limitations of available technology. Implementability of controls may also be considered, particularly in areas involving limited access to private properties. In addition, the potential for eliminating or reducing an urban runoff problem or improving affected water resources can be considered. Public questions and concerns can be influential during the decision-making processes. Applicable regulations and permit conditions may force the sequencing of corrective measures so that those addressing compliance with the regulations or permit conditions are implemented first.

Goals and Objectives Assessments

Finally, municipalities should evaluate storm water runoff problems with respect to current and future goals.

Criteria To Consider

Municipalities will generally want to focus on those problems where preventive or corrective measures would provide the greatest benefit. One goal, for example, might be to increase the use of public beaches by decreasing bacteria counts and aesthetic nuisances associated with storm water events. Application of goals and objectives criteria could identify where corrective measures would provide the greatest benefit, perhaps at beaches only slightly degraded and needing only minimal cleanup before they are restored, or at beaches in heavily populated areas where many people could benefit from restoration of the water body. Criteria a municipality may consider when considering which sources to target or which receiving waters to address include:

- Potential for achieving water resource goals as described in the water quality standard
- Potential for realizing short-term benefits, thereby building good will and commitment to long-term objectives
- Consistency with other land use objectives
- Consistency with programmatic goals of SWMP
- Opportunity to maximize efforts by coordinating activities with other agencies

Methods for Assessing Attainment of Goals and Objectives

The relative importance of an urban runoff problem may be assessed by comparing that problem to the program's water resource and technology-based goals and objectives. By considering pollution problems in connection with the program's goals and objectives, the program team can identify and focus on the urban runoff problems most important in attaining the overall aims of the program. The assessments conducted on pollutant sources, water resources, and institutional aspects provide input to these determinations.

How to Rank Storm Water Runoff Problems

Municipal storm water pollution problems can be numerous, and funding to correct these problems is usually limited. It is desirable, therefore, that a priority list of sources or impacts be developed to allow for targeting of limited resources. Ranking is a subjective process that requires the judgement of decision-makers. A ranking methodology can range from simple, descriptive methods (qualitative) to numerically complex (quantitative) methods, depending on the requirements of the urban runoff program objectives and the constraints of program funding. Ranking methods can be applied to a variety of geographic areas, ranging from counties or communities with multiple watersheds or individual water bodies or pollution sources.

A ranking methodology is developed for a specific study area to encourage a phased approach and to ensure the optimal allocation of available resources. Several methodologies can be used to rank pollution problems for control, depending on the complexity of the watershed, water resources, and their problems.

Criteria such as those presented in Table 2-1 can be used in problem ranking. Ranking should be conducted following consultation with involved parties, including local, State, and Federal agencies, local environmental groups, and concerned citizens.

Qualitative Rankings

The simplest approach is to use qualitative rankings, such as high, moderate, or low, to prioritize pollution problems. Table 2-4 provides an example of such a ranking system. The assigned ratings must then be interpreted to determine which areas should receive the highest priority as appropriate controls are developed. The use of rating points or categories can allow all the criteria to be evaluated on an equivalent basis. For each problem, the ranking criteria can be assigned relative ratings of 1 to 10, with a higher rating indicating a higher priority. In Table 2-4, the criteria used to gauge which area should receive highest priority for storm water management include imperviousness of the site, land use, runoff coefficient, annual runoff volume.

Quantitative Rankings

To perform numerical ranking, a rating is assigned to each ranking criterion for each problem. The assigned ranking for a criterion can then be multiplied by its relative weight for each pollution problem. All of the products (Criterion Ranking \times Relative Weight) should be summed for a given problem. This procedure is then repeated for all problems being evaluated. The sums thus assigned should be compared, and the problems with the highest sums should receive the highest priority during implementation of urban runoff controls. An example of numerical ranking is given on page 2-23.

An important point for municipalities to consider when using the rankings is that the ultimate goal is to address their specific water quality problems. For example, in a given municipality, stream bank erosion from high intermittent flows may be a more serious problem than eutrophication from high nutrient input. In this case, the municipality would weigh runoff volume control heavier than nutrient removal in runoff.

STEP 4: SCREEN, RANK, AND SELECT CONTROLS

Once particular waterbodies and sources have been targeted for action (based on the criteria discussed in Step 3), the municipality's task is to determine the most cost-effective solutions to solve the identified problems. In addition, local communities can also respond to individual symptoms of deterioration in urban watersheds and waterbodies by the increased impervious areas of new development. A report from Metropolitan Washington Council of Governments (Schueler 1994), which summarized a twelve-step process to design, implement, and maintain the best system of practices and land uses for stream protection, could be a good reference for development review on effective local stream protection. The following section discusses the tools needed to prioritize and rank solutions or control measures in relationship to program goals.

TABLE 2-4. ESTIMATED NONPOINT SOURCE LOADINGS USING CONSTANT CONCENTRATIONS

Source Area	Description and Location	Area (acres)	% Impervious	Land Use	Runoff Coeff.	Annual Runoff Volume (MG)	Annual FCOL Loading org x 10 ¹² (rank)	Annual NO ₃ -N Loading lbs (rank)	Qualitative Ranking
A	Main St and Freeport Outlet Stores	3.3	85	Commercial ^a	0.73	2.7	1.7 (12)	14 (11)	Low
B	Commercial development at I-95 Interchange, Main St, and Pine St	30.6	50	Commercial	0.45	15.7	9.8 (1)	82 (1)	High
C	A portion of Freeport Crossing Outlets, Main St, Varney Rd, and Kar Klean	13.9	60	Commercial	0.61	9.7	6.0 (3)	51 (4)	High
D	Main St, Varney Rd, a portion of Linwood Rd, and adjacent residential development	21.0	10	Multifamily Residential	0.13	3.1	2.0 (10)	24 (8)	Low
E1	South LL Bean parking lot	6.5	85	Industrial	0.73	5.4	2.8 (7)	28 (7)	Medium
E2	Northern LL Bean parking lot	5.5	80	Industrial	0.69	4.3	2.2 (8)	23 (9)	Medium
F	Independence Way, Eastland Shoe warehouse, Horsefeathers Restaurant, and Main St	14.1	20	Commercial	0.21	3.4	2.1 (9)	18 (10)	Low
G	Somerset Condominiums, Summer St, Upper West St, and Freeport Place Condominiums	38.0	20	Single ^b and Multifamily Residential	0.21	9.1	5.9 (4)	73 (3)	High
H	Municipal Garage, Main St, and town office parking lot	15.0	60	Industrial Commercial	0.53	9.1	4.7 (5)	48 (5)	High
I	Downtown Village area along Main St, between Morse and West St, including Oak	19.2	75	Commercial	0.65	14.2	8.8 (2)	75 (2)	High

Source: Metcalf & Eddy, 1992

^a FCOL Conc. = 16,000 org/100 ml, NO₃-N Conc. = 0.63 mg/l

^b FCOL Conc. = 17,000 org/100 ml, NO₃-N Conc. = 0.96 mg/l

^c FCOL Conc. = 14,000 org/100 ml, NO₃-N Conc. = 0.63 mg/l

^d FCOL Conc. = 37,000 org/100 ml, NO₃-N Conc. = 0.96 mg/l

EXAMPLE: NUMERICAL RANKING SYSTEM

The following is an example of a numerical ranking system for prioritizing pollution sources. A hypothetical application of this weighted ranking methodology uses the following criteria: water body importance (as reflected by stream or lake size), type of use (ranging from urban drainage to recreational contact), status of use (impaired versus denied), level of use (low, moderate, or high), pollutant loads (not actual loads but estimates for comparative purposes), and implementability of controls (based on institutional factors, existing ordinances, or technical considerations). The criteria used for this example are similar to those identified in Table 2-1. Other criteria may be just as valid. The relative importance of the ranking criteria is designated by assigning each criterion a weight appropriate for the site-specific conditions of the watershed under consideration. The sum of all weights used to rank the problems equal 100. Next, for each problem, the criteria are ranked using a suggested range of 1 to 9, with a higher numerical ranking indicating a higher need for corrective action. This listing allows relative comparisons to be made among problems with respect to a single criterion.

This numerical ranking method for prioritizing pollution problems is illustrated in the hypothetical urban watershed (below) which consists of three streams and several types of land use (Figure 2-1). Information describing the system is presented in Tables 2-5 and 2-6. Typical sources for these data include site-specific pollutant loading data, model results, and literature values from such projects as the NURP study. For this example, the three "use" criteria are clustered together as subcriteria of a "beneficial use" criterion. There are, thus, four prioritization criteria of equal weight: stream size, beneficial use, pollutant load, and ability to implement (Table 2-7).

Ranking for "stream size" is determined according to the total drainage area of each of the three streams. Consistent with the goals for the hypothetical watershed, Stream C is ranked highest with respect to "type of use" because of its recreational uses in the city park, Stream B receives the lowest ranking because it is used mainly as an urban drain, and Stream A is ranked between the other two streams because it is used to support aquatic life. With respect to "status of use," Stream A ranks highest because although somewhat impaired, it has the potential to be improved by control of pollution sources. Stream B receives a low ranking for use status because its water quality is poor and its function as part of an urban drainage system has long been accepted. Stream C also receives a low ranking for use status since the water is of high quality. Rankings for "level of use" reflect the number of people using or affected by each stream.

Mass pollutant loadings are calculated based on runoff coefficients (functions of the amount of impervious area), runoff concentrations of pollutants, and the amount of land use type in each stream's drainage area. Each stream is ranked based on the proportion of pollutant load from its watershed (in this example, total suspended solids is used). The watershed of Stream B is judged to be easiest to implement controls because it is predominantly industrial. Based on the method presented in this example, the watershed of Stream C should receive priority during implementation of controls, followed by the watershed of Stream A and then that of Stream B.

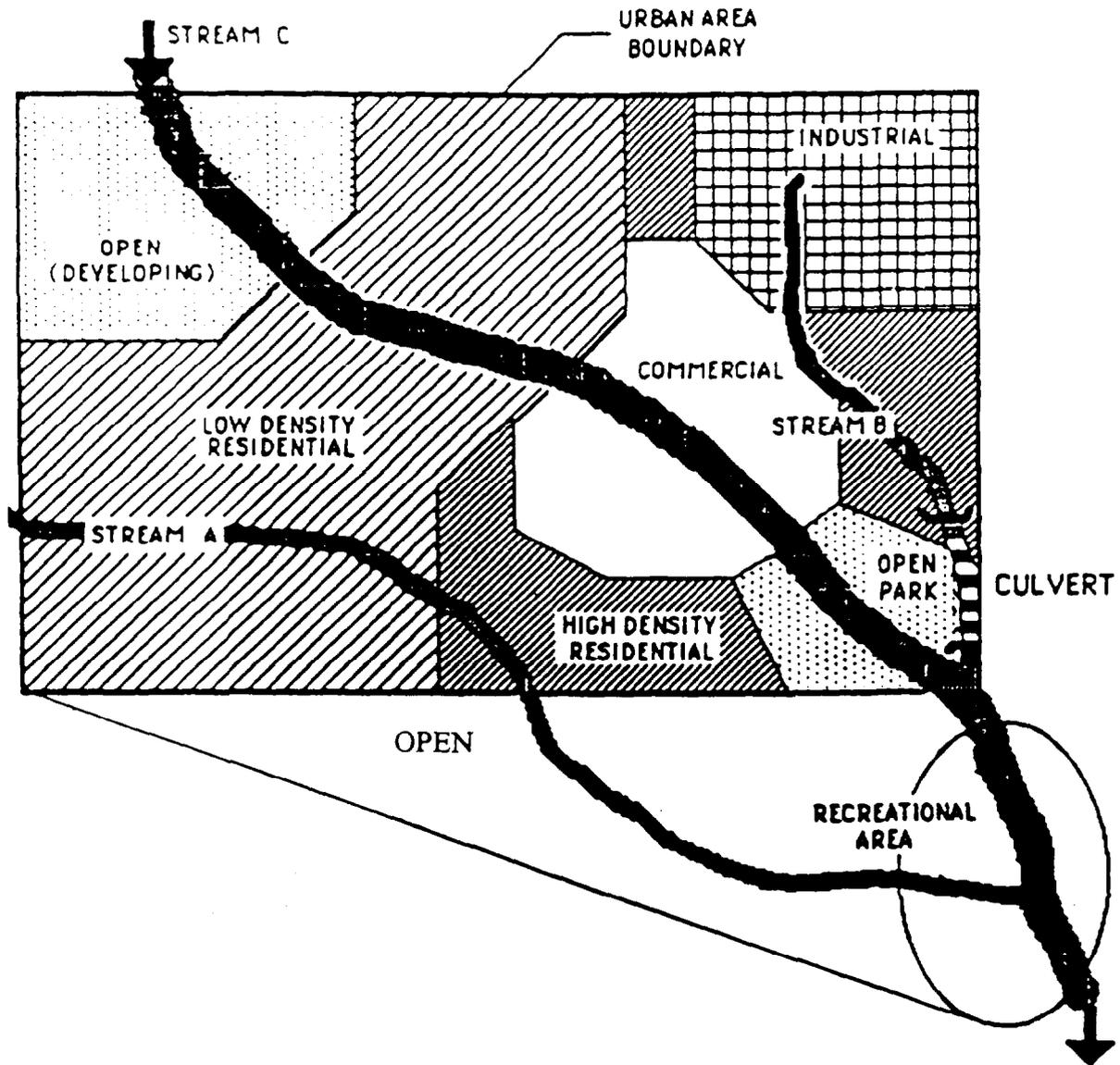


Figure 2-1. SCHEMATIC REPRESENTATION OF WATERSHED

TABLE 2-5. CHARACTERISTICS OF THE TARGETED AREAS AND ESTIMATED CONCENTRATION LOADS

Land Use Category	Runoff Coefficient	Average Concentration in Runoff (mg/l)				Drainage Area (acres)			
		Total Suspended Solids	Oil and Grease	Total Phosphorus	Copper	Stream A	Stream B	Stream C	Urban Total
Industrial	0.6	120	20	0.20	0.05	0	150	0	150
Commercial	0.8	80	15	0.20	0.05	10	80	110	200
Residential (High Density)	0.4	90	10	0.40	0.04	100	100	50	250
Residential (Low Density)	0.2	100	5	0.60	0.03	200	0	200	400
Open - Developing	0.1	150	0	0.80	0.01	0	0	150	150
Open - Urban Park	0.1	50	0	0.80	0.01	0	0	50	50
Total Urban Area						310	330	580	1,200
Upstream Drainage Area						600	0	20,000	20,600
Total Drainage Area						910	330	20,560	21,800

Source: Woodward & Clyde, 1990

TABLE 2-6. ESTIMATED TOTAL SUSPENDED SOLID LOADS FOR TARGETED AREAS

Land Use Category	Total Suspended Solids Load (lbs per inch of rain)			
	Stream A	Stream B	Stream C	Urban Total
Industrial	0	150	0	2,452
Commercial	10	80	1,598	2,906
Residential (High Density)	100	100	409	2,043
Residential (Low Density)	200	0	908	1,816
Open - Developing	0	0	511	511
Open - Urban Park	0	0	57	57
Watershed Total	1,870	4,431	3,482	9,784
Watershed Rank Value	1.7	4.1	3.2	9.0

Source: Woodward & Clyde, 1990

TABLE 2-7. PRIORITIZATION ANALYSIS FOR URBAN AREA TARGETING

Urban Watershed	Stream Size	Beneficial Use			Pollutant Load (TSS)	Ability to Implement	Target Score
		Type	Status	Level			
Weights	25	10	10	5	25	25	100
Watershed A	4	5	7	4	1.7	5	4.08
Watershed B	2	2	2	1	4.1	7	3.73
Watershed C	8	8	2	6	3.2	3	4.85
Total Urban Watershed	8	8	5	8	9.0	2	6.45

Target Score = Weighted Average of Rank Points = $\text{Sum}(\text{Rank Score} \cdot \text{Weight}) / \text{Sum}(\text{Weights})$

TSS: Total Suspended Solids

Source: Woodward & Clyde, 1990

Selecting BMPs for preventing and controlling storm water runoff pollution is a two-step process. First, a comprehensive list of BMPs should be compiled and screened to eliminate those that are inappropriate for the program. The appropriate BMPs are then assessed to select those that will ultimately be implemented in the SWMP.

The construction of facilities to collect and treat urban runoff may be prohibitively expensive. Therefore, the emphasis of storm water pollution control should be on developing a cost-effective approach that includes nonstructural controls and low-cost structural controls. Nonstructural controls include both regulatory controls (e.g., pollution prevention measures and land use controls) and source controls (e.g., controls that reduce pollutant buildup or lessen its availability for wash-off during rainfall). Low-cost structural controls include the use of facilities that reduce the kinetic energy associated with storm water, control hydraulic and flow distribution over the system, and remove coarse particulates. Dissolved pollutants and colloids then are further reduced by filtration, infiltration, plant uptake, a biotic function, or biodegradation. Given below is a list of the types of controls and BMPs available to municipalities for managing their storm water runoff (discussed in detail in Chapter 7).

EXAMPLES OF SOURCE CONTROL AND TREATMENT BMPs	
Regulatory Controls	<ul style="list-style-type: none"> • Land use regulations • Comprehensive runoff control regulations • Land acquisition
Source Controls	<ul style="list-style-type: none"> • New development controls • Illicit discharge controls • Materials management controls (fertilizers, chemical storage and use) • Street storm sewer maintenance controls • Oil spill prevention and cleanup • Public education/pollution prevention
Treatment Controls	<ul style="list-style-type: none"> • Detention facilities • Infiltration practices • Vegetative practices • Filtration practices • Water quality inlets • Retrofitting existing flood control facilities

How to Screen BMPs

The goal of the BMP screening process is to reduce the list of BMPs to a more manageable number to be considered for implementation. Because this is an initial step, the methods used are generally qualitative and require that good engineering judgement be exercised.

For the purposes of screening, BMPs are divided into two general categories: structural and nonstructural. Structural BMPs, such as detention basins and infiltration practices, are designed to address specific pollutants from known sources. In contrast, nonstructural BMPs, which include regulatory practices (such as those that limit impervious areas or protect natural resources) and source controls (such as street sweeping or solid waste management) are typically implemented throughout an entire community, watershed, or special area to be protected. Municipal storm water management programs, in most cases, rely on a combination of both structural and nonstructural practices. Methods for screening these two types of BMPs are outlined below. Chapters 5 and 6 present detailed guidance on implementing structural and nonstructural BMPs.

Nonstructural Practices

Nonstructural BMPs are a good solution when limited funds are available. In addition, these BMPs can perform an auxiliary role to a structural BMP. Many low-cost techniques can lead to significant improvements in water quality. Urban storm water management programs typically include a number of nonstructural BMPs. For example, an urban runoff management plan for the Santa Clara Valley identified more than 100 separate potential nonstructural BMPs used throughout the county (Woodward-Clyde, 1990-1992). To reduce the large number of available BMPs, municipalities must screen these regulatory and source control BMPs for their appropriateness to the watershed. The case study at the end of Chapter 2 discusses the Santa Clara Valley program and the BMP screening and selection method.

One screening method involves applying screening criteria to each nonstructural practice to determine its applicability to the conditions in the watershed. The screening criteria will be specific to the watershed and will depend on the goals of the program. Typical criteria include:

- **Pollutant Removal:** Different regulations and source control practices are designed to address different pollutants and, therefore, the program team should ensure that the screened list of controls includes those practices designed to address the pollutants of primary concern. Certain source control measures (e.g., development of a public information program) may not be measured in terms of reduction in pollutants loads. Therefore, municipalities may want to use alternate measures, such as the level of public participation in recycling programs or the number of community outreach activities completed.
- **Existing Government Structure:** Some practices implemented throughout the country require a specific government structure. For example, a strong county government may be important for implementing a specific regulatory control. However, the role of county governments can vary from one section of the country to another. Practices requiring specific government structures that do not exist in the area of concern could, therefore, be eliminated from the list.
- **Legal Authority:** For regulatory controls to be effective, municipalities must have the legal authority to implement and enforce regulations. Municipal boards and officials may lack this authority and may be required to obtain it through local action.
- **Public or Municipal Acceptance:** It may be difficult to implement some practices because of resistance from the public or an involved municipal agency. An improved communications strategy or other appropriate measures may improve the perception of these practices.
- **Technical Feasibility:** Some of the municipal BMPs described may require large expenditures, extensive efforts, and long-term operation and maintenance costs. Therefore, they may not be suitable for implementation in small municipalities that lack the required resources.

Additional screening criteria may also be used, as shown in the Santa Clara Valley case study at the end of Chapter 2. Another method of screening involves the use of a comparative summary matrix, an example of which is presented in Figure 2-2 (EPA 1993b). This matrix was developed for screening nonstructural control practices in coastal areas; however, it is at least in part applicable to inland areas as well. In this matrix, various regulatory and source control practices are listed and compared for their ability to meet various criteria. The criteria listed generally include ability to remove specific pollutants, such as nutrients and sediments, maintenance requirement, longevity, community acceptance, secondary environmental impacts, costs, and site requirements. Other criteria are also listed, and some of these are only applicable in coastal areas. For each practice and criterion, an assessment of effectiveness is indicated,

with the solid circle indicating high effectiveness and the open circles indicating low effectiveness. This type of matrix may provide a basis for making an initial assessment of practices and their applicability to the program.

Structural Practices

Because structural practices generally are more site-specific and have more restrictions on their use than nonstructural practices, the initial screening step for these practices can be more precise than the initial screening step for nonstructural practices. Table 2-8 outlines some of the more important criteria for screening structural BMPs, including their pollutant removal efficiencies, land requirements, the drainage area that each BMP can effectively treat, the desired soil conditions (e.g., soils favorable for infiltration), ground water elevation, and costs. By using these criteria and the information obtained in the data collection and analysis and problem identification and ranking steps, the program team can narrow the choice of BMPs to a list that can be further assessed in the BMP selection step.

The initial screening criteria for structural practices include the following:

- **Pollutant Removal:** It is important for the municipality to ensure that the BMPs selected address the primary pollutants of concern to the level of removal desired.
- **Land Requirements:** Large land requirements for some of the above-ground structural BMPs can often restrict their use in highly developed urban areas.
- **Soil Characteristics:** Structural BMPs have differing requirements for soil conditions. Infiltration facilities generally require permeable soils, while detention BMPs generally require impermeable soils. The municipality must become familiar with soil conditions in the watershed. A good source of information on local soil information is the United States Department of Agriculture (USDA-NCRS).
- **Ground Water Elevation:** The ground water elevation in the watershed can be a limiting factor in siting and implementing structural BMPs. Generally, high ground water elevation can restrict the use of infiltration facilities.
- **Public Acceptance:** It may be difficult for a municipality to implement a structural BMP that meets with general public approval. Public acceptance of the BMP is an important consideration in the screening step.
- **Technical Feasibility:** Some of the municipal BMPs described may require large expenditures, extensive efforts, and long-term operation and maintenance costs. Therefore, they may not be suitable for implementation in small municipalities that lack the required resources.

Of the screening criteria listed, the pollutant removal, land requirements, and drainage area served are usually absolute restrictions. Soil condition and ground water elevation, on the other hand, impose restrictions that can potentially be overcome by importing needed soil or constructing facilities with clay liners to restrict ground water inflow. These modifications, however, can add significantly to BMP costs.

	Open Space Protection	Habitat Protection	Federal Protection	Wildland Protection	Single Use	Single Use/Urban	Expanded Urban	Coastal Urban	Wildland Urban	Special Urban	Environmental Reserves	Performance Zoning	Overlay Zones	Protection Zones	Rural Zones	Intense Zones	1. Coastal Density Zones	
<ul style="list-style-type: none"> ● 80% High Levels of Control ○ 20 - 60% Moderate Levels of Control ○ 0 - 20% Low Levels of Control ● Prohibitive 																		Nutrient Control
<ul style="list-style-type: none"> ● Highly Effective ○ Moderately Effective ○ Low Effectiveness ● Prohibitive 																		Shrink
<ul style="list-style-type: none"> ● Directly Prohibit ○ Indirectly Prohibit ○ No Protection ● Not Required 																		Estuarine Habitat Protection
<ul style="list-style-type: none"> ● 80% High ○ 20 - 60% Med ○ 0 - 20% Low ● Prohibitive 																		Sedimentation
<ul style="list-style-type: none"> ● Highly Effective ○ Moderately Effective ○ Low Effectiveness ● Prohibitive 																		Sediment Toxic
<ul style="list-style-type: none"> ● Highly Effective ○ Moderately Effective ○ Low Effectiveness ● Prohibitive 																		Stormwater Control
<ul style="list-style-type: none"> ● Widely Applicable ○ Applicable Depending on Site ○ Somewhat Applicable ● Not Applicable 																		Feasibility in Coastal Areas
<ul style="list-style-type: none"> ● Low Burden ○ Moderate Burden ○ High Burden ● Not Applicable 																		Maintenance Burden
<ul style="list-style-type: none"> ● Long Lifespan ○ Long Lifespan with Maintenance ○ Short-lived ● Not Applicable 																		Longevity
<ul style="list-style-type: none"> ● Positive ○ Neutral ○ Negative ● Mixed 																		Community Acceptance
<ul style="list-style-type: none"> ● None or Positive ○ Slight Negative Impacts ○ Strong Negative Impacts at Some Sites ● Prohibitive 																		Secondary Environmental Impacts
<ul style="list-style-type: none"> ● Low ○ Moderate ○ High ● Very High 																		Cost to Developers
<ul style="list-style-type: none"> ● Low ○ Moderate ○ High ● Very High 																		Cost to Local Governments
<ul style="list-style-type: none"> ● Easy ○ Moderate ○ Tough ● Very Tough 																		Difficulty in Local Implementation
<ul style="list-style-type: none"> ● Suitable ○ Moderate ○ Conditional ● None 																		Site Data Required
<ul style="list-style-type: none"> ● Can be Used Immediately in These Areas ○ Somewhat Can Be Used ○ Somewhat Used ● Not Used 																		Water Dependent Use

FIGURE 2-2. SAMPLE NONSTRUCTURAL CONTROL SCREENING MATRIX

TABLE 2-8. STRUCTURAL BMP INITIAL SCREENING CRITERIA

Structural BMPs	Pollutant Removal (1)					Land Requirements	Drainage Area (2)	Desired Soil Conditions	Ground Water Elevation
	Suspended Solids	Nitrogen	Phosphorus	Pathogens	Metals				
Detention Facilities									
Extended Detention Basins	Medium-High	Low-Medium	Low-Medium	--	Low-Medium	Large	Medium-Large	Permeable	Below Facility
Wet Ponds	Medium-High	Low-Medium	Low-Medium	--	Low-Medium	Large	Medium-Large	Impermeable	Near Surface
Constructed Wetlands	Medium-High	Low	Low-Medium	--	Medium-High	Large	Large	Impermeable	Near Surface
Infiltration Facilities									
Infiltration Basins*	Medium-High	Medium-High	Medium-High	High	Medium-High	Large	Small-Medium	Permeable	Below Facility
Infiltration Trenches/ Dry Wells*	Medium-High	Medium-High	Low-Medium	High	Medium-High	Small	Small	Permeable	Below Facility
Porous Pavement	High	High	Medium	High	High	N/A	Small-Medium	Permeable	Below Facility
Vegetative Practices									
Grassed Swales	Medium	Low	Low	--	Low-Medium	Small	Small	N/A	N/A
Filter Strips	Medium-High	Medium-High	Medium-High	--	Medium	Varies	Small	N/A	N/A
Filtration Practices									
Filtration Basins	Medium-High	Low	Medium	--	Medium-High	Large	Medium-Large	Permeable	Below Facility
Sand Filters	High	Low	--	--	Medium-High	N/A	Small-Medium	N/A	N/A
Water Quality Inlets	Low-Medium	Low	Low	--	Low	N/A	Small	N/A	N/A

(1) Low = 0-30%; Medium = 30-65%; High = 65-100%

(2) Small = 0-10 acres; Medium = 10-40 acres; Large = >40 acres

N/A = Not applicable

* Potential for failure high, especially when not designed and installed properly.

Sources: Schueler, 1987; Woodward-Clyde, 1991.

BMP Selection Process

Having screened the initial list of BMPs, municipalities can now rank and select a final set of BMPs using the decision-making process (Figure 2-3) described below. This process evaluates the relative merits of each BMP or group of BMPs. Because of the complexity of urban runoff control problems, a number of factors must be taken into account in assessing alternative plans. These are presented in Figure 2-3 as inputs to the decision process and include analysis tools and decision factors. The analysis tools are those used to assess and rank the existing pollution problems (see beginning of Chapter 2). The decision factors are the criteria used to compare the alternatives. All of these inputs are then used to evaluate the alternatives using one or more decision analysis methods. The following discussion discusses each input to the decision analysis, then describes the various decision analysis methodologies that may be used to select BMPs for ultimate inclusion in the SWMP.

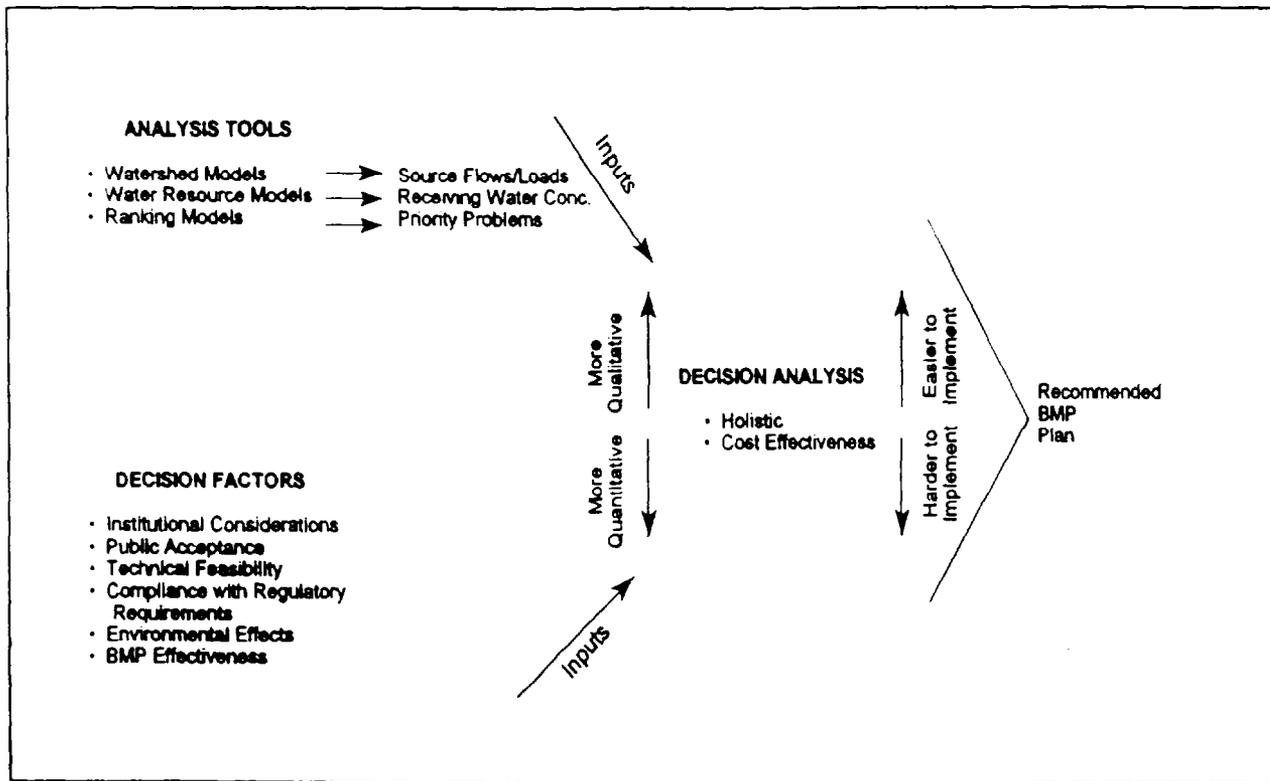


FIGURE 2-3. CONCEPTUAL DIAGRAM OF BMP SELECTION METHOD

Analysis Tools

These tools were described in detail during the discussion of Step 3. They can consist of watershed models, receiving water models, and ranking models. The analysis tools are used to project future conditions, given the alternatives being investigated. For example, the total pollutant loads for each alternative may be calculated (whether using a unit load method or complex models, such as SWMM). This will serve as one item of input information as the alternatives are

being compared. Similarly, the impacts to receiving waters may be assessed using these tools, so that the impacts can be compared when making a decision.

Criteria for Decision-making

An important step in BMP plan selection is to determine the decision factors of importance. The selection of these criteria is site-specific and needs to be determined by the program team based on the characteristics of the watershed and the financial and personnel resources available. Typical decision-making criteria are discussed below. Note that they are similar to the problem assessment criteria use in Step 3.

Institutional Considerations

To evaluate and select appropriate BMPs, municipalities may want to consider a number of institutional factors, including existing governmental structures, legal authority, and implementation responsibilities. If the proper legal authority does not exist, an analysis for attaining this authority must be undertaken (as required under Part 2 of the application). In addition to these considerations, the team should investigate existing urban runoff programs in the community, region, or State. Often, cost savings are realized and total program efforts reduced by taking advantage of material and data compiled from existing programs. It should be noted that these decision factors are similar to the assessment criteria used to rank pollution problems. Factors to consider when ranking BMPs are:

- Degree to which existing technologies or programs (municipal, State, Federal) could be used
- Availability of tools (technical methods and measures) to address adverse side effects of a particular action
- Extent to which legal authority exists to implement the BMP.

Public Acceptance

In many instances, the public will be responsible for at least a portion of the funding required to implement the recommended plan. Public reaction to aspects of the storm water management program should, therefore, be assessed through the use of public meetings. Measuring public acceptance can be difficult, but is often important to the overall success of a program. The main factors to consider are:

- Level of public support to address problems
- Level of public support for implementing a particular BMP
- Public perception of the value of the resource.

Technical Feasibility

Cost is one of the most important factors to consider when selecting BMPs. Municipalities should consider the costs associated with both the development and implementation of nonstructural BMPs and the construction and operation of structural BMPs. Total costs should be reflected in addition to capital and operation and maintenance costs for each alternative. The benefits associated with the implementation of a control plan are usually more difficult to determine. For example, if an urban runoff control plan is designed to reduce the discharge of fecal coliform to a closed shellfish area, there will be monetary benefits when these beds are reopened. These benefits are difficult to quantify but should not be neglected when selecting BMPs. The factors to consider are:

- Relative costs for a particular BMP
- Availability of funds (capital) to initiate the project
- Availability of funds to operate and maintain BMPs over time.

Construction Issues

In evaluating and selecting BMPs (particularly structural BMPs), municipalities should consider various aspects of construction, including site requirements, the extent of disruption, and the degree of construction difficulty. When relying on complex structural controls, there are difficulties inherent in construction and future maintenance that need to be overcome. Construction issues are not as important when assessing source control and regulatory control practices. However, for structural controls, they can often be very important. The factors to consider include:

- Land requirements
- Soil requirements
- Ground water elevation
- Slope.

Compliance With Regulatory Requirements of the SWMP

BMPs should also be assessed on their capacity to meet the regulatory requirements of the SWMP. For example, as part of the SWMP, municipalities must prevent illicit discharges from entering the storm sewer system. In addition, they must control discharges into their storm sewer systems from industries. BMPs that work toward achieving these programmatic requirements would be assigned higher priority than those that do not. Priority considerations and pollution sources should be the focus of the selected alternative. The factors to consider are:

- Extent to which regulatory requirements are satisfied
- Extent to which specific programmatic measures of the SWMP are satisfied.

Environmental Effects

The implementation of pollution control measures for storm water runoff can affect the environment in a number of ways. When evaluating various BMPs, municipalities should consider the potential effects—both positive and negative—that may result from their implementation. The many resources that can be positively affected include water resources, aquatic animal and plant life, wildlife, and wetlands. The negative environmental effects, which can include aesthetic problems, cross-media contamination, the loss of useable land, and wetlands impacts, may also be considered.

The importance of considering BMP side effects is becoming more widely recognized. Indeed, there is a shift away from viewing BMPs simply in terms of their pollution control ability. Incorporating structures into new developments or retrofitting them in existing areas can gain wider acceptance if aesthetic qualities are considered. For example, unvegetated above-ground infiltration basins or extended detention basins are generally not attractive elements of the environment and may serve as insect breeding grounds. However, natural-looking wet ponds or vegetated wetlands can be incorporated into the environment and even improve aesthetics. These are issues that can greatly affect public acceptance. The main factors to consider are:

Potential for positive effects of BMPs on the community (e.g., property value, aesthetics), water resources, aquatic animal and plant life, wildlife, or wetlands

- Potential for negative effects due to BMP, such as aesthetic problems, cross-media contamination, the loss of useable land, wetlands impacts, operation and maintenance costs to the community (taxes).

Secondary environmental impacts from municipal BMPs most often affect wetlands because of the role they play in storm water management. Constructed wetlands are used in the treatment of urban storm water discharges within a storm water management program. The impacts of urban storm water discharges on wetlands include degradation of wetland hydrology, wetland water quality, wetland soils, and wetland plants and animals. As a result of urbanization, wetland hydrology is affected by the increased quantity and poor quality of the storm water discharges. The impacts to wetland hydrology include lower wetland response time, change in water levels in the wetland, and a change in the wetland's detention time. The changes in wetland water quality that result from urban storm water runoff are physical and chemical. The physical changes occur in temperature, conductivity, and the level of suspended solids. The chemical changes result from the increased levels of toxic substances, metals, and nutrients contained in the storm water runoff. Impacts to wetland soils include changes in the pH and redox potential. The combined results of the above impacts negatively affect plants and animals in the wetland. The increased levels of storm water runoff can flood plants and the feeding and breeding grounds of many animals. Also, the toxicity levels in storm water runoff may kill plants and other food for animals within the wetland habitat.

BMP Effectiveness

Estimating the effectiveness of a BMP is one of the most important factors a municipality will consider as part of the BMP selection process. In most cases, determining BMP effectiveness for structural controls is easier than for nonstructural controls. Structural controls (e.g., detention facilities and infiltration basins) may be assessed in terms of their demonstrated capacities to remove pollutants (see Chapter 7), whereas nonstructural controls (e.g., street sweeping, land use regulations, and solid waste management) may be evaluated according to indirect measures, such as the degree to which public awareness is heightened or the number of community outreach programs that are implemented.

Some municipalities may choose quantitative, decision analysis techniques to assess BMPs, whereas others may prefer to use more basic qualitative assessments backed by basic statistics, such as cost-effective data. While qualitative factors may be subjective by their very nature, the need for more quantitative, decision analysis models may be unnecessary during the early steps of BMP selection.

One type of qualitative analysis involves a holistic approach, which relies on the use of certain basic facts, intuition, and professional judgment. One key deciding factor (cost, for example) can guide the process. Given the inherent complexity of assessing alternative urban runoff control plans and the large number of available inputs to the decision, this approach is usually over-simplified. The selection of an appropriate plan from the developed alternatives will generally require an assessment of multiple factors and should be done in as quantitative a manner as is reasonably possible.

Quantitative approaches include such measures as cost-effectiveness analyses. A cost-effectiveness analysis helps the municipality attain a predetermined goal with the least expensive method possible.

SUMMARY

The process of targeting storm water runoff problems and selecting BMPs to control those problems is difficult and can best be performed by undertaking a systematic assessment process. Because of the qualitative nature of some inputs to these assessments and decisions, subjective comparisons among the alternative plans will likely be necessary. Where

cost-benefit issues need to be addressed, or where technically complex cases are encountered, more quantitatively based, analytical tools may be necessary. The process outlined in this chapter acts as a guide for decision making and cannot account for all of the circumstances that might be encountered. Professional judgment and care is needed at each step along the way. Once these choices have been made and BMPs have been selected, the storm water management program is ready to be implemented.

WORKSHEETS

The next two pages contain worksheets developed for the *State of California Storm Water Best Management Practice Handbook (Municipal)*. These worksheets may be useful in setting priorities for selecting municipal source and treatment controls.

CASE STUDIES

The following case studies provide examples of methods for both assessing storm water runoff problems and evaluating/selecting appropriate BMPs to address those problems.

VIRGINIA BEACH, VIRGINIA, PART 2 APPLICATION, SETTING PRIORITIES

This section summarizes the Virginia Beach, Virginia, Part 2 Storm Water permit application. The example illustrates the overall program priorities considered by Virginia Beach for the initial implementation of its storm water management program.

Program priorities were developed based on a qualitative approach rather than a rigorous quantitative approach using specific evaluation criteria that are assigned values and weights. Priorities, however, were considered by evaluating each activity listed in Table 2-9 using the following guidelines:

- Level of pollution load reduction (if high, then higher priority)
- Cost (if low, then higher priority)
- Public acceptance (if high, then higher priority)
- Type of program (if ongoing program, then higher priority than enhanced ongoing program; if new program, then lower priority than existing program; if program designed to meet a minimum requirement not presently undertaken by city, then a higher priority)
- Type of development (if program for new development, then higher priority than for program for existing development)

Using these guidelines, the first priority programs and the second priority programs were selected and are presented in Table 2-9 under the heading Priorities with either a "1st" priority or a "2nd" priority indication.

Schedule

Figure 2-4 shows an overall schedule for the program activities listed in Table 2-9. Many of the ongoing programs (e.g., BMP Reinspection Program) and some of the new programs (e.g., implementation and enforcement of new storm sewer system ordinance) will be fully implemented during each year of the term of the permit. Other programs will require phased implementation (e.g., development of a slide show for reporting illicit discharges), and still others will be developed during the middle years of the program (e.g., evaluation of any existing major flood control structures for water quality benefits). For some programs, the schedule indicates the number of ponds, structures, and sites to be considered (e.g., ongoing field screening for up to 25 new sites a year) for each year of the permit. The frequency (e.g., once a year) of monitoring and specific inspection programs are also indicated on the schedule.

Program Evaluation

During the term of the permit, the city, principally through the Department of Public Works, will monitor the progress of implementing the components of the comprehensive management program and the representative monitoring program. As part of this process, the city will evaluate the pollution removal/control effectiveness of the various program activities. For commercial and residential areas, the comprehensive storm water management program will be tracked and evaluated in light of the new and existing ordinances related to storm water quality. The expanded BMP data base will be monitored to assure that new data on structural BMPs are being used by the BMP reinspection program to assist in the maintenance schedule for structural controls, including major sediment removal.

TABLE 2-9. PROPOSED MANAGEMENT PROGRAM ACTIVITIES*

Activities	Priorities
Program for Commercial and Residential Areas	
<ul style="list-style-type: none"> • Master Plan for New Development <ul style="list-style-type: none"> - Maintenance of Comprehensive Plan - Existing Ordinances - Owl Creek Watershed Protection Program - Design Guidelines 	<ul style="list-style-type: none"> 1st 1st 1st 2nd
<ul style="list-style-type: none"> • Maintenance of Structural Controls <ul style="list-style-type: none"> - Maintenance of Structures <ul style="list-style-type: none"> -- Retention/Detention Ponds -- Ditches/Canals/Waterways -- Oil/Water Separators -- Volume Control BMPs -- Culverts/Structures - BMP Reinspection Program - BMP Data Base Expansion - Major Sediment Removal 	<ul style="list-style-type: none"> 1st 1st 1st 1st 1st 1st 2nd 2nd
<ul style="list-style-type: none"> • Practices for O&M for Streets, Roads, and Highways <ul style="list-style-type: none"> - Erosion and Sediment Control - Catch Basin and Ditch Cleaning - Snow and Ice Control - Litter Control - Other Programs 	<ul style="list-style-type: none"> 1st 1st 1st 1st 1st
<ul style="list-style-type: none"> • Flood Management Procedures Assessment 	<ul style="list-style-type: none"> 1st
<ul style="list-style-type: none"> • Pesticide, Herbicide, and Fertilizer Application <ul style="list-style-type: none"> - Certification and Licensing - Training - Public Education 	<ul style="list-style-type: none"> 1st 1st 2nd
<ul style="list-style-type: none"> • Storm Water Master Plan Continuation <ul style="list-style-type: none"> - Plan Maintenance - Storm Sewer System Inventory 	<ul style="list-style-type: none"> 1st 2nd
Program for Illicit Discharges and Improper Disposal	
<ul style="list-style-type: none"> • Implementation and Enforcement of Ordinance 	<ul style="list-style-type: none"> 1st
<ul style="list-style-type: none"> • Ongoing Field Screening <ul style="list-style-type: none"> - Sites from Part 1 Investigation - New sites each year 	<ul style="list-style-type: none"> 1st 2nd

TABLE 2-9. PROPOSED MANAGEMENT PROGRAM ACTIVITIES (Continued)

Activities	Priorities
Program for Illicit Discharges and Improper Disposal (Continued)	
<ul style="list-style-type: none"> • Storm Sewer Investigations <ul style="list-style-type: none"> - Mapping and Evaluation <ul style="list-style-type: none"> -- Part 1 sites -- New sites - Field surveys <ul style="list-style-type: none"> -- Part 1 sites -- New sites - Source Identification <ul style="list-style-type: none"> -- Part 1 sites -- New sites 	<ul style="list-style-type: none"> 1st 2nd 1st 2nd 1st 2nd
<ul style="list-style-type: none"> • Spill Response and Inspection Program 	1st
<ul style="list-style-type: none"> • Reporting of Illicit Discharges <ul style="list-style-type: none"> - Brochures, Cityline Message and Slide Show - Hotline and main-in programs 	<ul style="list-style-type: none"> 1st 2nd
<ul style="list-style-type: none"> • Controls to Limit Infiltration 	1st
Program for Industrial Facilities	
<ul style="list-style-type: none"> • Mount Trashmore (Closed Landfill) <ul style="list-style-type: none"> - Inspection/Maintenance of Park - Monitoring Program for Two Lakes 	<ul style="list-style-type: none"> 1st 1st
<ul style="list-style-type: none"> • Landfill No. 2 <ul style="list-style-type: none"> - Inspection - Monitoring at One Site 	<ul style="list-style-type: none"> 1st 2nd
<ul style="list-style-type: none"> • Other Facilities Data Evaluations 	2nd
Program for Construction Sites	
<ul style="list-style-type: none"> • Site Plan Review 	1st
<ul style="list-style-type: none"> • Inspection/Enforcement 	1st
<ul style="list-style-type: none"> • Training Site Operators 	2nd

*Taken verbatim from the Part 2 NPDES Storm Water Permit Application prepared by the City of Virginia Beach, Virginia (1992)

ACTIVITIES	YEAR OF PERMIT				
	1	2	3	4	5
COMMERCIAL AND RESIDENTIAL AREAS					
Master Plan for New Development					
Comprehensive Plan					
Existing Ordinances					
Owl Creek Watershed Protection Program					
Design Guidelines					
Maintenance Plan for New Development					
Maintenance of Structures					
BMP Reinspection Program					
Data Base Expansion					
Major Sediment Removal	2 ponds	2 ponds	2 ponds	2 ponds	2 ponds
Practices for O&M for Streets, Roads, and Highways					
Flood Management Procedure Assessment					
Pesticides, Herbicides, and Fertilizer					
Certification/Licensing					
Training (O = developed)	O				
Public Education (O = developed)	O				
Storm Water Master Plan					
Water Quality Model					
Plan Maintenance					
Storm Sewer System Inventory (continuing after 5 years)					
ILLICIT DISCHARGES AND IMPROPER DISPOSAL					
Implementation and Enforcement of Ordinance					
Ongoing Field Screening					
Sites from Part 1 Investigation	30 sites				
New Sites Each Year	25 sites	25 sites	25 sites	25 sites	25 sites
Storm Sewer System Investigations					
Mapping and Evaluation					
Part 1 Sites	30 sites				
New Sites	25 sites	25 sites	25 sites	25 sites	25 sites
Field Surveys					
Part 1 Sites		30 sites	25 sites	25 sites	25 sites
New Sites		25 sites	25 sites	25 sites	25 sites

**FIGURE 2-4. CITY OF VIRGINIA BEACH, VIRGINIA
PROPOSED STORM WATER MANAGEMENT PROGRAM SCHEDULE***

ACTIVITIES	YEAR OF PERMIT				
	1	2	3	4	5
Source Identification					
Part I Sites		30 Sites			
New Sites		25 Sites	25 Sites	25 Sites	25 Sites
Spill response and Inspection Program					
Reporting of Illicit Discharges					
Brochure, Cityline Message, and Slide Shows (O = Developed)	O				
Call-in and Mail-in (O = Developed)	O				
Proper Management and Disposal of Toxic Materials					
Support for Ongoing Programs					
Brochure, Cityline Message, and Slide Shows (O = Developed)	O				
Controls to Limit Infiltration					
INDUSTRIAL FACILITIES					
Mount Trashmore					
Inspection/Maintenance of Park Monitoring Program for Two Lakes	Twice	Twice	Twice	Twice	Twice
Landfill No. 2	O				
Inspection	4 Times	4 Times	4 Times	4 Times	4 Times
Monitoring at a Site	Once	Once	Once	Once	Once
Other Activities Evaluations					
Site Data					
Site Inspection of Each Site	Once	Once	Once	Once	Once
CONSTRUCTION SITES					
Site Plan Review					
Inspection/Enforcement					
Training Site (O = Developed)	O	Once	Once	Once	Once

FIGURE 2-4. CITY OF VIRGINIA BEACH, VIRGINIA
 PROPOSED STORM WATER MANAGEMENT PROGRAM SCHEDULE (Continued)

KING COUNTY'S BASIN PLANNING PROGRAM ESTABLISHING WATERSHED PRIORITIES

Criteria for Prioritizing Basins

The primary objective of King County's watershed approach is to protect and maintain the integrity of County stream systems and to prevent their degradation to the degree possible.

King County's philosophy is that stream protection must be accomplished through the evaluation and management of land and water within the entire watershed; that erosion cannot be managed without controlling the high flows that cause erosion; that water pollution cannot be adequately reduced without controlling the runoff and sediment, by which pollutants are transported; and that aquatic habitat cannot be managed without considering all of the chemical, physical, and hydrological elements that define each habitat.

Accordingly, criteria for prioritizing watersheds were developed to give planning urgency to those basins where hazardous conditions, such as landslides and flooding, were most frequent/severe and where water quality and habitat have not been severely affected (and could yet be preserved through proactive planning).

The initial basin planning prioritization was based on a significant body of knowledge gained from the 1987 Basin Reconnaissance program, a field inventory of problems and potential solutions conducted during the rainy seasons of 1985-1986 and 1986-1987. Multidisciplinary teams noted existing problems and features in portions of 29 service area basins. These data were used directly to determine ratings for each basin in four major categories: Existing Problems, Future Problems, Existing Resources, and Urgency/Timeliness. Rating criteria were associated with each major category, as listed in Table 2-10 below.

Table 2-10. BASIN PLANNING PRIORITIZATION CATEGORIES AND CRITERIA*

Category	Criteria
Existing Problems	<ul style="list-style-type: none"> - Landslides - Erosion/Sediment - Flooding
Future Problems	<ul style="list-style-type: none"> - Land in Unincorporated King County - Subdivision/Plat Activity - Population Growth - Permitted Residential Units
Existing Resources	<ul style="list-style-type: none"> - Stream Habitat - In-Stream Resources - Wetland Value - Wetland Storage Potential - Water Quality Potential
Urgency/Timeliness	<ul style="list-style-type: none"> - Other Agency Interest - Opportunity to Integrate with Other Programs

* Taken verbatim from the Part 2 NPDES Storm Water Permit Application prepared by the King County Surface Water Management Division (1992)

Problem counts for each category were generated from the Technical Appendix of each Basin Reconnaissance report (included with the Part 1 permit application). For example, for the Landslides, Erosion/Sedimentation, and Flooding categories, the following ratings were applied: "0" - low (few problems), "1" - moderate (some problems), and "2" - high (many problems). For other criteria, such as Water Quality and Stream Habitat, opposite scores were assigned: "0" - low quality (many problems), "1" - moderate (some problems), and "2" - high quality (few problems).

Tables 2-11 through 2-14 show the final scores of each basin for each major category. Table 2-15 shows the ranking of basins according to total scores. These rankings form the basis of the proposed basin planning schedule shown in Table 2-16.

By the end of 1992, the County will have completed, or will be substantially underway, with basin plans for 12 of the 37 basins in the surface water management service area. As expected from the ranking criteria, the first basins selected for planning services were predominately rural watersheds. More recently, the Surface Water Management Division has begun the basin planning process in urban or urbanizing basins, such as Miller Creek, Seola Creek, and Salmon Creek. The planning process for these basins will incorporate many of the same management strategies applied to rural basins and will be complemented with new programs being developed and implemented as part of the NPDES program (e.g., drainage mapping, illicit discharge surveys, and source control best management practices).

TABLE 2-11. BASIN PRIORITIZATION*

I. Existing Problems (from Basin Reconnaissance)				
Criteria				
Drainage Basin	Landslide	Erosion/ Sediment	Flooding	Sheet 1 Total
McAleer	1	1	2	4
Lyons	0	1	2	3
Swamp	0	1	2	3
Sammamish	2	2	1	5
North	0	0	0	0
Little Bear	0	1	1	2
Big Bear	0	2	1	3
Thornton	0	0	1	1
Lk Washington	0	2	1	3
Juanita	1	2	2	5
Forbes	0	1	1	2
Evans	1	2	1	4
W Lk Sammamish	1	2	1	4
E Lk Sammamish	1	2	1	4
Coal	1	1	1	3
Tibbetts	2	1	1	4
Mav	1	2	2	5
N Fk Issaquah	0	1	1	2
E Fk Issaquah	0	1	1	2
Issaquah	1	2	0	3
Lower Cedar	2	2	2	6
Duwamish	0	1	2	3
Black	1	2	0	3
Mill	0	2	2	4
Lower Green	1	2	1	4
Soos	0	1	2	3
Jenkins	0	1	2	3
Covington	0	0	0	0
Middle Green	2	1	1	4
Boeing	2	2	1	5
Middle Puget	1	1	1	3
Lower Puget	2	2	1	5
Salmon	1	1	1	3
Miller	0	1	1	2

TABLE 2-12. BASIN PRIORITIZATION*

II. Future Problems					
Criteria					
Drainage Basin	Land in Unincorp. King Co.	1982-1987 Subdivision/ Plat Activ.	Population Growth	Permitted Residential Units	Sheet 2 Total
McAleer	1	1	0	1	3
Lyons	0	1	0	2	3
Swamp	0	1	1	2	4
Sammamush	1	2	2	1	6
North	0	2	1	2	5
Little Bear	0	1	2	0	3
Big Bear	1	1	2	2	6
Thornton	1	0	0	0	1
Lk Washington	0	2	1	1	4
Juanita	2	2	2	2	8
Forbes	1	2	1	2	6
Evans	2	2	2	1	7
W Lk Sammamush	0	2	1	2	5
E Lk Sammamush	2	2	2	2	8
Coal	1	1	2	0	4
Tibbetts	1	1	1	0	3
May	1	0	1	1	3
N Fk Issaquah	2	0	1	0	3
E Fk Issaquah	1	0	0	0	1
Issaquah	2	0	0	0	2
Lower Cedar	0	1	1	1	3
Duwamish	0	0	0	1	1
Black	0	1	1	2	4
Mill	1	0	1	0	2
Lower Green	1	2	1	2	6
Soos	2	2	2	1	7
Jenkins	2	1	1	1	5
Covington	1	0	0	0	1
Middle Green	0	0	0	1	1
Boeing	2	1	0	2	5
Middle Puget	0	0	0	0	0
Lower Puget	1	2	2	2	7
Salmon	2	0	0	2	4

TABLE 2-13. BASIN PRIORITIZATION*

III. Existing Resources						
Criteria						
Drainage Basin	Stream Habitat	In-Stream Resources	Wetland Value	Wetland Strg. Pot.	Water Quality	Sheet 3 Total
McAleer	0	0	0	0	1	1
Lyons	0	0	0	0	0	0
Swamp	1	1	1	0	1	4
Sammamush	0	2	1	1	1	5
North	1	2	0	0	2	5
Little Bear	1	2	0	0	2	5
Big Bear	1	2	2	2	2	9
Thornton	0	0	0	0	0	0
Lk Washington	0	0	1	1	0	2
Juanita	1	1	1	0	1	4
Forbes	1	1	1	1	1	5
Evans	1	1	2	2	1	7
W Lk Sammamush	0	1	0	0	1	2
E Lk Sammamush	1	1	2	2	1	7
Coal	0	1	1	0	1	3
Tibbetts	1	2	0	0	1	4
Mav	1	1	2	1	1	6
N Fk Issaquah	1	1	1	1	1	5
E Fk Issaquah	1	1	1	1	1	5
Issaquah	2	2	2	1	2	9
Lower Cedar	1	1	2	2	1	7
Duwamish	1	1	0	0	0	2
Black	0	2	1	0	0	3
Mill	0	1	1	0	0	2
Lower Green	0	1	2	1	1	5
Soos	1	2	2	2	1	8
Jenkins	2	2	2	2	2	10
Covington	2	2	2	2	1	9
Middle Green	1	2	2	1	1	7
Boeing	0	0	0	0	0	0
Middle Puget	0	0	0	0	0	0
Lower Puget	0	0	2	1	0	3

TABLE 2-14. BASIN PRIORITIZATION*

IV. Urgency/Timeliness			
Drainage Basin	Criteria		
	Other Agency Interest	Opp. to Integrate with Other Programs	Sheet 4 Total
McAleer	1	0	1
Lyons	1	1	2
Swamp	1	0	1
Sammamish	0	1	1
North	0	0	0
Little Bear	0	0	0
Big Bear	2	2	4
Thornton	1	0	1
Lk Washington	0	0	0
Juanita	0	0	0
Forbes	0	0	0
Evans	2	1	3
W Lk Sammamish	1	1	2
E Lk Sammamish	1	1	2
Coal	1	0	1
Tibbetts	2	1	3
May	0	0	0
N Fk Issaquah	2	2	4
E Fk Issaquah	2	2	4
Issaquah	2	2	4
Lower Cedar	0	1	1
Duwamish	2	1	3
Black	0	1	1
Mill	2	2	4
Lower Green	0	2	2
Soos	2	2	4
Jenkins	2	2	4
Covington	2	2	4
Middle Green	0	2	2
Boeing	0	0	0
Middle Puget	0	0	0

TABLE 2-15. BASIN PRIORITIZATION*

Summation Sheet Ranked According to Total Score					
Drainage Basin	Existing Problems	Future Problems	Existing Resources	Urgency/ Timeliness	Total Sum
Big Bear	3	6	9	4	22
Jenkins	3	5	10	4	22
Soos	3	7	8	4	22
E Lk Sammamish	4	8	7	2	21
Evans	4	7	7	3	21
Hylebos	4	6	7	2	19
Issaquah	3	2	9	4	18
Juanita	5	8	4	0	17
Lower Cedar	6	3	7	1	17
Lower Green	4	6	5	2	17
Lower Puget	5	7	3	2	17
Sammamish	5	6	5	1	17
Covington	0	1	9	4	14
May	5	3	6	0	14
Middle Green	4	1	7	2	14
N Fk Issaquah	2	3	5	4	14
Tibbetts	4	3	4	3	14
Forbes	2	6	5	0	13
W Lk Sammamish	4	5	2	2	13
E Fk Issaquah	2	1	5	4	12
Mill	4	2	2	4	12
Swamp	3	4	4	1	12
Black	3	4	3	1	11
Coal	3	4	3	1	11
Salmon	3	4	4	0	11
White	2	1	7	1	11
Boeing	5	5	0	0	10
Des Moines	3	2	2	3	10
Little Bear	2	3	5	0	10
North	0	5	5	0	10
Duwamish	3	1	2	3	9
Lk Washington	3	4	2	0	9

TABLE 2-16. PROPOSED BASIN PLANNING SCHEDULE 1992 - 1997*

Basin/Start Year	Current and Future Conditions Report	Draft Basin Plan	WMC Proposed Basin Plan	WMC-approved or Executive Proposed	Expected Adoption
Soos/87	—	Nov 89		July 90	Jan 92
Bear/87	—	Dec 89		May 91	Oct 92
Hylebos-LPS/88	July 90	Feb 91		July 91	Jan 93
ELS/88	Sept 90	May 92	Nov 92	June 93	Sept 93
Issaquah/89	Oct 91	Nov 92	Apr 93	Sept 93	Jan 94
Cedar/91	Jan 93	July 93	Jan 94	Sept 94	Jan 95
May 2/92	Aug 93	April 94		Nov 94	May 95
Miller-Salmon-Seola/92	Oct 93	July 94		Feb 95	Aug 95
Green/94	May 95	Feb 96		Dec 96	Jun 97
Duwamish-Black-Mill/94	Feb 95	Oct 95		May 96	Nov 96
Sammamush 94	Dec 95	Sept 96		Apr 97	Oct 97
Boeing-McAleer-Lyon-Thornton/95	Feb 96	Oct 96		May 97	Dec 97
Juanita, E LK Wa. 96	Apr 97	Dec 97		Jul 98	Dec 98
W. Lk. WA. W. Lk. Samm 96	May 97	Dec 97		Jul 98	Dec 98

*Taken verbatim from the Part 2 NPDES Storm Water Permit Application prepared by the King County Surface Water Management Division (1992)

THE EIGHT-STEP BMP PLANNING PROCESS DEVELOPED BY CHARLOTTE, NORTH CAROLINA

This section summarizes the Part 2 storm water permit application prepared by Charlotte, North Carolina. The discussion does not mirror the planning process described in this manual, but rather presents a variation for municipalities to consider.

Step 1 — Develop Criteria to Evaluate Objective Attainment and Planning

The table below, taken verbatim from the Charlotte, North Carolina, Part 2 storm water permit application, summarizes the factors considered in each of the Charlotte Storm Water Quality Management Program (SWQMP) elements. The purpose of the table was to force full consideration of both the pros and cons of each program element and to assist the city in determining the practicability of each measure in formulation of its MEP.

TABLE 2-17. BEST MANAGEMENT PRACTICE SCREENING CRITERIA*

BMP					
	Criteria Description	+	0	-	Comments
1.	Human Risk, Public Safety and Potential Liability				
2.	Environmental Risk and Implications				
3.	Ability to Control Key Targeted Pollutants				
4.	Costs to Implement and Continuing Costs				
5.	Acceptability to the Public, Stakeholders, Staff and Political Leadership				
6.	Equitability to Impacted Persons				
7.	Reliability and Consistency Over Time				
8.	Sustainability in Terms of Maintenance or Program Management				
9.	Ability to be Applied Universally Throughout the Jurisdiction or, on a Specific Watershed Basis				
10.	"Fit with other Charlotte Operations and Programs				
11.	Relationship to other Federal, State, or Local Regulatory Requirements				
12.	Amenity or Multi-use Value				
Totals					

*Excerpted verbatim from the Part 2 Storm Water Permit Application prepared by Charlotte, North Carolina (1992)

Step 2 — Develop List of Possible Control Measures (BMP's)

There are almost an infinite number of variations on programmatic, structural, and nonstructural BMPs. A candidate set of nearly 100 control measures, program elements, and other activities was developed through brainstorming sessions. A preliminary screening was done of these based on engineering judgement and knowledge of what measures

were not remotely feasible. Candidate control measures and programs surviving this initial screen were subjected to a more formal consideration using the table in step 1.

Step 3 — Apply the Criteria to Screen the Measures

The criteria were generally applied (along with engineering judgement) to spotlight potential problems with the application of program elements. It was considered too premature to require the use of certain structural BMPs, though a more formal technical consideration of specific design standards and incorporation into Charlotte design criteria was adopted as a program element.

Step 4 — Preliminarily Analyze a Practical Set of Control Measures

This shortened list was organized and analyzed to determine how each measure will function singularly and in conjunction with other program elements and how and by whom these elements will be implemented. Another part of this analysis is to determine ranges of BMP application to allow for development of alternative programs and to get a feel for cost sensitivity where appropriate.

Step 5 — Estimate Overall Program Costs and Pollution Reduction Effectiveness

In most cases, particularly for nonstructural BMPs, it was very difficult to assign pollution reduction numbers without better data and information. In many cases it was inappropriate. Great care and engineering judgment must then be exercised. The steps generally were to:

- Define such factors as the control measures, phases of implementation, ranges of implementation, equipment, and locations as necessary to define the program as fully as possible; consider pilot applications and data monitoring feedback loops
- Make first order estimates of program costs in each implementation stage or phase.
- Realistically allocate budgets to these programs over the first 5-year permit period and at ultimate development as appropriate.
- Make first order estimates of the program's effectiveness by relying on the experience of other cities.

Step 6 — Obtain Feedback and Revise Program Scope to Maximize Program Cost Effectiveness

There is a need in any comprehensive program development to go back and look at the whole assembled puzzle after suitable examination of each of the pieces and after preliminary coordination with the permit writer. Adjustments were made to the program scope and schedule.

Step 7 — Describe Roles and Responsibilities to Implement the Program

After a preliminary SWQMP strategy was formulated, preliminary roles or responsibilities for each program element were identified. The local organizational structure and current program responsibilities were considered.

Step 8 — Develop Schedule for Implementation Control Program Including Management and Feedback Loops

The end result of this step is the schedule and budget for program implementation. It was considered important to evaluate the success of the programs at every step and build into each program ways to measure that success. This may be through specially designed feedback from the persons implementing the program, through data collection and monitoring, public awareness polls, or other means.

EXAMPLE METHOD FOR SELECTING SOURCE CONTROL BMPs

This section summarizes the *State of California Storm Water Best Management Practice Handbook (Municipal)*, Storm Water Quality Task Force, March 1993. The discussion provides a step-by-step planning example on how to select potential source control BMPs for inclusion in a municipal Storm Water Management Program. It assumes that program goals and priorities and existing conditions (Steps 1-3) have been identified. This example illustrates how source control BMPs may be selected using the Source Control Worksheet #1.

Selection Process

The selection criteria and the scoring system below are similar to other selection processes developed around California. It is recommended, however, that the criteria and/or the scoring be modified to suit the particular community. Modification of the following selection process attributes may be considered:

- **Criteria** — Redefine some of the criteria or add/subtract criteria.
- **Scores** — Modify the scoring to a simple +, 0, and -, or 1, 2, and 3.
- **Weighting** — Group the criteria into tiers reflecting their relative importance to specific SWMP goals. By multiplying the scores of the highest tier by some factor (e.g., x2), the first tier scores could be weighted more heavily than the others to reflect this importance.
- **Fatal flaw** — Provide for some fatal flaw in scoring the BMPs (e.g., the BMP is illegal or its implementation is completely unacceptable to the public) that would make implementation impossible. Scoring a fatal flaw as a 0 is one way of highlighting the flaw. Any BMP scoring a 0 against a criterion would be eliminated from consideration, regardless of its overall ranking.

Example

In the following example, municipality Anytown, California, is developing a Storm Water Management Program that includes an element for Residential/Commercial Activities. By following the steps below, the community uses Worksheet 1 to rank the BMPs according to their ability to meet the selection criteria. The worksheet shows the initial results of this hypothetical ranking.

1. The selection process involves consideration of following:
 - Table 2-18, Application of BMPs to SWMP Program Elements
 - Discussion of selection criteria
 - Worksheet 1
 - Source Control BMPs.

2. A review of Table 2-18 shows that for Residential/Commercial Activities, the storm water regulations require the SWMP to have an element addressing Roadway and Drainage Facility Maintenance. The program activity and element are listed at the top of Worksheet 1.
3. Looking across the Roadway and Drainage Facility Maintenance row in Table 2-18, two categories of source control BMPs apply, Material Use Control and Street/Storm Drain Maintenance.
4. The Material Use Control category includes two types of BMPs, Housekeeping Practices and Safer Alternative Products. These are listed on Worksheet 1.
5. Several BMPs are described within each fact sheet. These are also listed on Worksheet 1.
6. Using the discussion of selection criteria, the BMPs are ranked against the selection criteria using the scale of 1-5.
7. For the first BMP, Distribute Public Education Materials, the following scores are recorded:
Meets Regulatory Requirements = 3. Public education meets the intent of the storm water regulations.
Effectiveness of Pollutant Removal = 2. Effectiveness of source control is high; however, insufficient data exist to support this claim.
Public Acceptance = 5. Anytown believes that the public education materials are available from other municipalities and agencies to serve as models or to purchase for use as is.
Implementable = 5. The existing department and staff may be used, and public education materials are available from other municipalities and agencies to serve as models or to purchase for use as is.
Institutional Constraints = 4. To provide a consistent message to the public, Anytown must coordinate its public education program with the county, which already has in place a hazardous waste disposal program. The county has indicated that it will cooperate fully with Anytown to ensure that the public education material is consistent with the county's program.
Costs = 5. Given the availability of materials to serve as models or to use directly, production should be relatively inexpensive.
8. Addition of the criteria scores across each row produces a total score, which may be compared to the other totals.
9. The process is continued for each of the source control BMP categories checked in Table 2-18.

As a result of this evaluation, Anytown, California, implemented all the BMPs in the Housekeeping Practices and Safer Alternative Products categories, as well as the maintenance BMPs in the Street/Storm Drain Maintenance category. However, the scores for the other Street/Storm Drain Maintenance BMPs indicated that further study was necessary before their implementation could be proposed. Anytown, California, also found that storm drain flushing was not allowed by the local sewer agency, so this fatal flaw removed this BMP from further consideration.

A Few Points to Remember

- Have several people or one of the storm water committees conduct the selection independently to get a broad perspective on the relative merits of each BMP and to help reach a consensus.
- Keep the selection system as simple as possible and use best professional judgment to interpret and to conduct a reality check on the total scores.
- Remember that differences of a few points in the total score are probably not significant.
- Use the final rankings to plan and prioritize the SWMP. For example, those BMPs with the highest scores may be implemented in the first year of the NPDES permit, while low scoring BMPs may need more time to develop, relegating their implementation to the fifth year or to further study.
- Use the exercise of working through this selection to provide the necessary data to promote the program to other departments, political leaders, regulatory agencies, and the public.

WORKSHEET 1*							
SOURCE CONTROL BMP							
PROGRAM ACTIVITIES: Residential/Commercial							
PROGRAM ELEMENTS: Roadway and Drainable Facility Maintenance							
BMPs	Meets Regulatory Requirements (1 - 5)	Effectiveness of Pollutant Removal (1 - 5)	Public Acceptance (1 - 5)	Implementable (1 - 5)	Institutional Constraints (1 - 5)	Costs (1 - 5)	Total (30 MAX)
MATERIAL USE CONTROL:							
Housekeeping Practices							
• Distribute Public Education Material	3	2	5	5	4	5	24
• Train City Employees Regarding Chemical Use	3	3	5	4	4	5	24
Safer Alternative Products							
• Use Organic Soil Amendments	3	5	5	3	5	2	23
• Train City Employees Regarding IPM	3	3	5	4	4	5	24
• Substitute IPM for Pesticides	3	5	5	2	5	5	25
STREET/STORM DRAIN MAINTENANCE:							
Street Cleaning							
• Replace Mechanical Sweepers with Vacuum	3	3	5	3	3	1	18
• Increase Frequency Two Times a Week	3	2	5	3	4	2	19
• Maintain Equipment	3	2	5	5	5	4	24
• Maintain Operation Log	3	1	5	5	5	5	24
Storm Drain Flushing							
• Flushing	3	4	4	2	0	4	17*

*Taken verbatim from the *State of California Storm Water Best Management Practice Handbook*, Storm Water Quality Task Force, March 1993.

TABLE 2-18. APPLICATION OF BMPs TO SWMP PROGRAM ELEMENTS*

Required Elements of SWMP	Source Control BMPs Chapter 4							
	Planning Management	Material Use Control	Material Exposure Controls	Material Disposal & Recycling	Spill Prevention & Cleanup	Illegal Dumping Controls	Illicit Connection Controls	Street/Storm Drain Maintenance
FOR RESIDENTIAL/COMMERCIAL ACTIVITIES:								
Roadway and drainage facility maintenance		/						/
BMP planning for new development and redevelopment projects	/							/
Retrofitting existing or proposed floor control projects with BMPs	(See Page 3-9 Chapter 3)							
Municipal waste handling and disposal operations		/	/	/	/	/		
Pesticide, herbicide, and fertilizer use controls		/	/	/	/	/		
FOR IMPROPER DISCHARGE ACTIVITIES:								
Prevention, detection, and removal of illegal connection to storm drains							/	
Spill prevention, containment, and response		/	/	/	/	/		
Promote proper use and disposal of toxic materials		/	/	/	/	/		
Reduce storm water contamination by leaking/overflowing separate sanitary sewers					/	/		
FOR INDUSTRIAL ACTIVITIES:								
Inspection and control prioritization and procedures		/	/	/	/	/	/	/
Monitoring of significant industrial discharges						/	/	
FOR CONSTRUCTION AND LAND DEVELOPMENT ACTIVITIES:								
Water quality and BMP assessments during planning	/	/	/	/	/	/		/
Site inspection and enforcement procedures	/	/	/	/	/	/		/
Training for developers and contractors	/							

*Taken verbatim from the State of California Storm Water Best Management Practice Handbook (Municipal). Storm Water Quality Task Force

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION BMP SELECTION MATRIX

To address storm water and nonpoint source pollution control in areas of new development, the Maine Department of Environmental Protection (ME DEP) has developed a method to select BMPs. The method is based on the following information:

- Development land use type and size
- Receiving water type (e.g., estuary, wetland, river, or stream)
- Watershed priority (either priority or nonpriority)
- Erosion and sediment control target or "level to achieve"
- Storm water quality control target or "level to achieve"
- Erosion and sediment control options and "treatment level codes"
- Storm water quality control target or "treatment level codes."

To implement the BMP selection method, ME DEP has developed a series of eight matrices. There are two matrices for each receiving water type (estuary, wetland, river, and stream). One matrix is applied to development in designated priority watersheds, and the other is applied to development in nonpriority watersheds. A priority watershed list has been developed by ME DEP based on environmental sensitivity, local support for water quality, and importance of the watershed to the State. Example matrices for priority and nonpriority estuary watersheds are shown in Tables 2-19 and 2-20.

TABLE 2-19. PRIORITY ESTUARY STORM WATER CONTROL MATRIX*

Land Use Category	Erosion and Sediment Level to Achieve	Erosion and Sediment Controls	Water Quality Level to Achieve	Storm Water Controls
Low Density Residential >2 acres per lot	1	Erosion and Sediment 1	1	Buffer 1
High Density Residential <2 acres per lot	2	Erosion and Sediment 2	3	Buffer 1 or 2 Wet Pond 2 Infiltration 1 or 2 Created Wetland 2
Commercial <1 acre distributed	1	Erosion and Sediment 1	1	Buffer 1
Commercial 1-3 acres distributed	1	Erosion and Sediment 1	2	Buffer 1 or 2 Infiltration 1 Swale 1
Commercial >3 acres disturbed	2	Erosion and Sediment 2	4	Buffer 1 or 2 Infiltration 1 or 2 Created Wetland 2 Wet Pond 2 or 3 Fertilizer Control 1 Shallow Impoundment 1
Intensive Use Open Space (e.g., golf courses, nurseries)	2	Erosion and Sediment 2	5	Buffer 1 or 2 Fertilizer Control 1 Pesticide Control 1 Created Wetland 2 or 3 Wet Pond 2 or 3
Multi-housing Units	2	Erosion and Sediment 2	3	Buffer 1 or 2 Fertilizer Control 1 Pesticide Control 1 Created Wetland 2 Wet Pond 2 Infiltration 1 or 2
Industrial <1 acre disturbed	1	Erosion and Sediment 1	1	Buffer 1 Swale 1
Industrial 1-3 acres disturbed	1	Erosion and Sediment 1	2	Buffer 1 or 2 Swale 1
Industrial >3 acres disturbed	2	Erosion and Sediment 2	5	Buffer 1 or 2 Swale 1 Created Wetland 2 or 3 Wet Pond 2 or 3

*Taken verbatim from *Storm Water Best Management Practices—Second Draft*, prepared by the Maine Department of Environmental Protection (1990)

TABLE 2-20. NONPRIORITY ESTUARY STORM WATER CONTROL MATRIX*

Land Use Category	Erosion and Sediment Level to Achieve	Erosion and Sediment Controls	Water Quality Level to Achieve	Storm Water Controls
Low Density Residential >2 acres per lot	1	Erosion and Sediment 1	1	Buffer 1
High Density Residential <2 acres per lot	2	Erosion and Sediment 2	2	Buffer 1 or 2 Infiltration 1
Commercial <1 acre distributed	1	Erosion and Sediment 1	1	Buffer 1
Commercial 1-3 acres distributed	1	Erosion and Sediment 1	1	Buffer 1
Commercial >3 acres disturbed	2	Erosion and Sediment 2	2	Buffer 1 or 2 Infiltration 1 Swale 1 Shallow Impoundment 1
Intensive Use Open Space (e.g., golf courses, nurseries)	2	Erosion and Sediment 2	3	Buffer 1 or 2 Infiltration 1 or 2 Fertilizer Control 1 Created Wetland 2 Wet Pond 2
Multi-housing Units	2	Erosion and Sediment 2	2	Buffer 1 or 2 Infiltration 1
Industrial <1 acre disturbed	1	Erosion and Sediment 1	1	Buffer 1 Swale 1
Industrial 1-3 acres disturbed	1	Erosion and Sediment 1	2	Buffer 1 or 2 Swale 1
Industrial >3 acres disturbed	2	Erosion and Sediment 2	4	Buffer 1 or 2 Swale 1 or 2 Created Wetland 2 or 3 Wet Pond 2 or 3

- Taken verbatim from *Storm Water Best Management Practices—Second Draft*, prepared by the Maine Department of Environmental Protection (1990)

Each matrix has two major components, which are broken down by land use type. The first is an erosion and sediment control "level to achieve," and the second is a storm water quality "level to achieve." The "level to achieve" for a given combination of land use and receiving water category is a relative, qualitative measure of the impact of storm runoff pollution. It ranges from 1 to 5, with 1 being the lowest impact and 5 being the greatest impact. For example, a multi-housing development proposed for a priority estuary watershed is given an erosion and sediment "level to achieve" of 2 and a water quality "level to achieve" of 3. By comparison, a small residential development in the same priority watershed is given an erosion control "level to achieve" of 1 and a water quality "level to achieve" of 1. In all cases, the "levels to achieve" for priority watersheds are greater than or equal to those for nonpriority watersheds.

TABLE 2-21. BMPs AND TREATMENT LEVEL CODES*

BMPs	Level of Treatment
Erosion and Sediment Control	
• One line of erosion control	1
• Two lines of erosion control	2
Vegetative Buffers	
• 50 feet	1
• 125 feet	2
• 200 feet	3
Swales	1
Shallow Impoundments	1
Infiltration Systems	
• Single system	1
• Multiple systems	2
Wet Ponds	
• Single pond system holding 2.5 inches of runoff	2
• Double pond system each pond holding 2.5 inches of runoff	3
Created Wetlands	
• Single created wetland	2
• Two created wetlands	3
Street Cleaning	1
Fertilizer Application Control	1
Pesticide Use Control	1
Grass Patches with Level Spreaders	1
Converting impervious land to vegetative buffer (allowing land that is currently impervious to become a vegetative buffer)	1

*Taken verbatim from *Storm Water Best Management Practices—Second Draft*, prepared by the Maine Department of Environmental Protection (1990)

Each matrix also addresses the types of BMPs that can be implemented for pollution control. ME DEP selected a number of BMPs and assigned each a "treatment level code" based on the expected level of pollutant removal. The "treatment level code" is a relative, qualitative measure designed to indicate the relative pollutant removal expected from various BMPs. "Treatment level codes" range from 1 to 3, with 1 providing the lowest level of control and 3 providing the greatest level of control. The BMPs and their treatment level codes are shown in Table 2-21. As indicated, various designs for each BMP are given different treatment level codes. For example, a 50-foot buffer is given a treatment level code of 1, a 125-foot buffer is given a treatment level code of 2, and a 200-foot buffer is given a treatment level code of 3.

For a proposed development to be approved, the sum of treatment level codes for the proposed BMPs must be greater than or equal to the "level to achieve." For example, if a multi-housing unit development is proposed for a priority estuary

(erosion "level to achieve" of 2 and water quality "level to achieve" of 3, the developer could implement erosion and sediment controls (treatment level 2) and a combination of a swale (treatment level 1) and an infiltration system (treatment level 2). Additional combinations also could be implemented as long as the total "treatment level" provided is greater than or equal to the total "level to achieve." ME DEP has also recommended that at least one vegetative BMP be implemented unless the site is already 100 percent impervious. The specified vegetative BMPs are buffers, grassed swales with level spreaders, and swales.

This BMP selection system is in its early stages of implementation. Its success will depend on the ability to establish "levels to achieve" that will adequately protect the water bodies in new developments. It will also depend on the ability of treatment level codes to quantify the effectiveness of the identified control measures. Thus, the system is a technology-based approach for erosion and sediment control, as well as for storm water pollution control.

Currently, this method is outlined in a state-wide guidance document and is not a regulatory requirement. Municipal officials can incorporate this process at their discretion in subdivision regulations. This method of BMP selection requires extensive up-front work to develop the matrices and BMP levels of treatment. Once these are developed, however, this method provides a simple and direct technology-based approach to BMP selection. It has flexibility in terms of the range of BMPs that can be selected for given types of proposed development and given site constraints.

SANTA CLARA VALLEY, CALIFORNIA, NONPOINT SOURCE CONTROL PROGRAM BMP SCREENING AND SELECTION PROCEDURE

Background

In 1986, the San Francisco Regional Water Quality Control Board developed a Basin Plan for San Francisco Bay that involved regulatory activities to control point and nonpoint source discharges. This was the driving force behind initiating the Santa Clara Valley Nonpoint Source Control Program. This program involves a number of local governments and county agencies and is designed to address water quality problems in Lower South San Francisco Bay. In conducting this project, a process that closely follows the process outlined in this manual was used. The 12 steps are as follows:

- Develop Program
- Determine Existing Conditions
- Conduct Field Monitoring
- Define Program Objectives
- Develop Evaluation and Planning Criteria
- Prepare Inventory of Candidate Controls
- Apply Criteria to Screen Candidate Controls
- Apply Professional Judgment to Select a Practical set of Controls
- Estimate Overall Program Cost and Effectiveness
- Revise the Previously Defined Control Programs to Balance Cost, Effectiveness, and Other Factors
- Describe the Roles of Various Agencies
- Develop an Implementation Schedule.

Development of the Nonpoint Source Control Plan began in 1986 and has continued through various stages to initial implementation and preliminary assessment of effectiveness.

Watershed Description

Santa Clara County, which incorporates the entire study area, is located at the southern end of San Francisco Bay (see Figure 2-5). The watershed is approximately 690 square miles and consists primarily of the relatively flat Santa Clara Valley. Land use in the watershed is approximately 30 percent residential, 5 percent industrial (predominantly light industry associated with high technology manufacturing), and 62 percent open space. Large cities, San Jose, Sunnyvale, and Santa Clara, account for the majority of urban areas in the watershed.

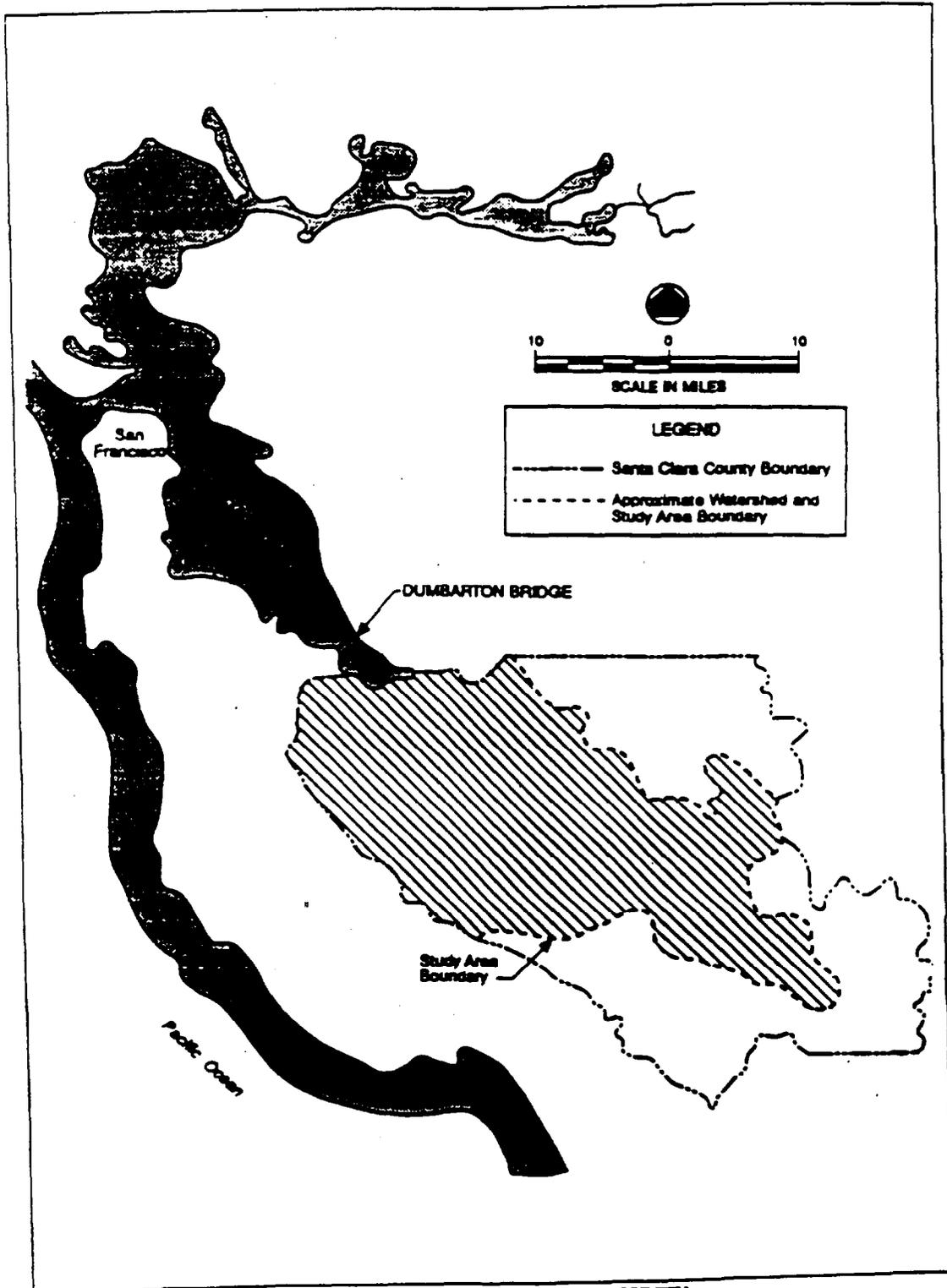


FIGURE 2-5. SANTA CLARA COUNTY

Overview of Water Quality

To characterize existing water quality in Lower South San Francisco Bay, a comprehensive monitoring program was undertaken. This program included hydrologic monitoring, wet and dry weather water quality monitoring, sediment monitoring, and biological monitoring. The monitoring was conducted primarily to determine the levels of toxic pollutants, such as heavy metals and pesticides, as well as nutrients and bacteria. Data obtained through this monitoring program were incorporated into data bases and used for developing computer models. Watershed loads were estimated using the Storm Water Management Model (SWMM), which was calibrated to the observed data gathered in the monitoring program. The data were also used to compare the relative contributions of point (e.g., waste water treatment plants) and nonpoint source pollution to the bay.

Water quality monitoring results indicated that heavy metal concentrations in receiving waters increase during wet weather due to contaminated runoff as well as resuspension of contaminated sediments. The metals primarily detected were cadmium, chromium, copper, lead, nickel, and zinc. However, copper was the primary metal regularly detected at levels greater than the EPA aquatic life toxic criterion during wet weather. The criteria were only occasionally exceeded for cadmium, lead, and zinc. Also, during wet weather, hydrocarbons and pesticides were detected in approximately 25 percent of the samples collected, while none was detected during dry weather. The limited bacteria data gathered indicated increased levels (by a factor of about 10) of fecal coliform bacteria during wet weather as compared to dry weather conditions.

Point and nonpoint source contributions to water quality problems in Lower South San Francisco Bay, the study showed that point sources account for approximately 98 percent of the nutrient load. However, nonpoint sources account for 60 to 80 percent of the load for metals and about 98 percent of the total suspended solids on a long-term basis.

Management Practice Screening

Because of the large size of the watershed and the variety of pollutants entering the Lower South San Francisco Bay, the emphasis of the nonpoint source pollution control program was on pollution prevention measures and nonstructural controls that could be implemented across municipal boundaries. Selection of appropriate pollution controls was accomplished through a process consisting of preliminary screening followed by final control measure selection (see Figure 2-6).

To screen the extensive list of potential pollution control practices, the program team first developed a list of important criteria for the selected control measures. The criteria developed for this project were:

- **Pollutants Controlled:** Emphasis is placed on controls for metals, pesticides, oil and grease, bacteria, and sediments.
- **Effectiveness:** Each control measure should contribute enough toward the overall program pollution control to warrant its inclusion.
- **Reliability/Sustain-ability:** Control measures should be effective over an extended period of time and be able to be properly implemented over time.
- **Implementation Cost:** Emphasis was placed on control measures with low planning, design, land acquisition, construction, and equipment acquisition costs.
- **Continuing Costs:** Emphasis was placed on control measures with low operation, maintenance, repair, support service, and equipment replacement costs.

- **Equitability:** Controls were evaluated regarding the degree to which costs and benefits would be considered to be equitably distributed.
- **Universality:** Controls were evaluated in terms of how universally they would have to be applied to be effective.
- **Public Acceptability:** Control measures were assessed on the expected response of agencies responsible for implementation.
- **Relationship to Regulatory Requirements:** Control measures were evaluated on their consistency with existing and anticipated regulatory requirements.
- **Risk/Liability:** Control measures were evaluated in terms of the risks or liabilities that may occur in implementation.
- **Environmental Implications:** Control measures were evaluated regarding the positive and negative environmental impacts resulting from their use.

Once the control measure criteria were listed and agreed upon, the project team developed a comprehensive list of potential control measures for implementation. The inventory of potential control measures was developed through a review of technical literature and other nonpoint source control programs. In addition, technical and managerial personnel from other State agencies, county agencies, and city public works and planning agencies were interviewed. This review resulted in a list of more than 120 separate control measures to be screened. This initial list was developed to be comprehensive, and no consideration was given to the applicability of the measures. However, once the list had been developed, obviously inappropriate control measures were eliminated. The control measures eliminated from the list at this step were primarily those designed to address specific situations that did not exist in the watershed. This initial screening reduced the list of potential pollution controls to 92.

This list of 92 control measures was then assessed qualitatively using the criteria developed earlier in the program. This was conducted by assigning each of the control measures a letter "grade" (A through F) for its ability to meet the criteria. Those measures receiving an "A" were viewed to meet all or a large number of the assessment criteria, while those receiving an "F" were viewed to meet none or very few of the assessment criteria. In this way, each of the potential control measures was assigned to a category. The control measures that fell into the category of "F" were immediately eliminated from further consideration in the Santa Clara Valley watershed.

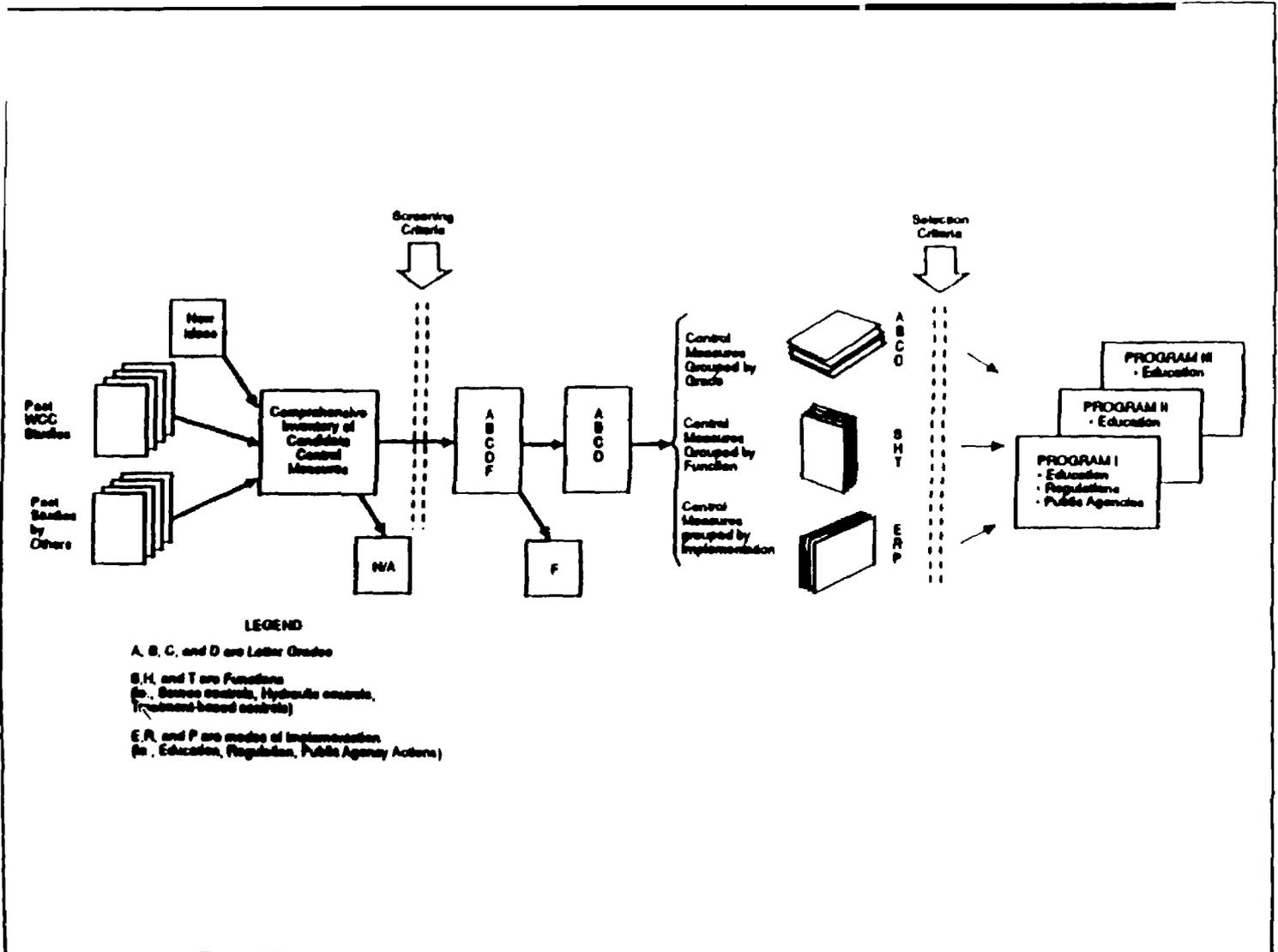


FIGURE 2-6. SELECTION OF APPROPRIATE POLLUTION CONTROLS

WAUKEGAN RIVER RESTORATION, LAKE COUNTY, ILLINOIS

The Waukegan River/Ravine system is the primary drainage for the urban areas of Waukegan. Significant point and nonpoint source discharges of storm water runoff create considerable water quality problems. Directly related to these water quality concerns are significant erosion and siltation problems occurring in various areas of the river/ravine system.

The Waukegan River/Ravine main channel and tributaries are approximately 12.5 miles. The watershed, primarily in Waukegan, is approximately 7,640 acres and receives storm water runoff from point and nonpoint discharges from an urban area with 80,000 residents. The river-ravine system has the highest population density (8.0 people per acre) of any river in Lake County. The Waukegan River discharges into Lake Michigan just east of the downtown area at a point 6,000 feet from the city's fresh water intake.

The water quality problems identified are siltation, suspended sediments, pesticides, petroleum products, and solid waste. In addition, unstable stream channels result in severe bank erosion, and damaged sewer lines along the stream channel. Stream channel instability has already broken up small sewer lines that enter the main sewer (buried in the floodplain along the stream).

In response to these problems, a number of implementation activities have occurred. The Lake County Storm Water Management Commission developed a model environmental storm water strategy and is implementing a nonpoint source pollution awareness project. This strategy is a watershed-based, multiobjective approach that considers all the environmental values associated with surface water. This comprehensive strategy includes a complete coordinated system addressing program operations, planning design, construction, finance, maintenance, and regulations. In addition, the strategy addresses prevention, remediation, and maintenance.

A specific program to restore this area includes the restoration of urban streambanks through the development of technical and legal procedures for urban stream management and training of local government employees in the bioengineering techniques of vegetative stream stabilization. Also, to improve water quality in the Waukegan River, an aerator was installed and an illicit connection program is proposed.

The purpose of the storm water pollution prevention awareness project is to increase the awareness of urban storm water pollution problems in Lake County, Illinois, through pollution prevention advertisements (e.g., messages, graphics, and photographs) on billboards, buses, and bus stops. The advertisements will address such urban runoff issues as gasoline spills on pavements, storm drains clogged by debris, sediment runoff from construction sites, erosion of urban stream banks, and runoff of phosphate detergents into storm drains. Preventive actions will include storm drain stenciling programs and recycling of motor oil.

An intensive 10-year monitoring and evaluation program has been implemented to demonstrate and evaluate the effectiveness of the storm water best management practices (BMPs) implemented in the Waukegan River watershed. This monitoring effort focuses on the impacts of the storm water pollution control program on urban fisheries and stream habitat.

LINCOLN CREEK SUBWATERSHED, MILWAUKEE, WISCONSIN

Identification of Water Quality Problems

Physical Setting

Lincoln Creek is a 9 mile high gradient warm water stream in the Milwaukee River South Watershed. The Milwaukee River drains into Lake Michigan. The creek's drainage area, the City of Milwaukee, is mostly urbanized.

Land Use

Lincoln Creek is the largest urban subwatershed in the Milwaukee River South Watershed, draining 12,600 acres. This subwatershed is entirely urban, although there are large areas of recreational and open space land, including a U.S. Army tract, the State's Havenwoods Forest Preserve and Nature Center, the Milwaukee County Lincoln Creek Parkway, and golf courses and municipal parks.

Residential lands dominate the subwatershed. High density residential areas cover 35 percent of the subwatershed and multifamily residential areas cover an additional 15 percent. Industrial areas cover 12 percent and commercial areas 7 percent of the subwatershed. Most of the subwatershed is contained within the city of Milwaukee. However, a small portion is contained within the city of Glendale and includes primarily industrial and multifamily land uses.

Project Area Size

The Lincoln Creek drainage area is about 20 square miles (12,600 acres), and the entire area is urbanized. The breakdown for some of the land uses is high density residential (35%), multifamily residential (15%), industrial (15%), and commercial (7%).

Critical Areas

Critical land uses were identified using the Source Loading and Management Model (SLAMM). Critical areas were those that had the highest annual loads of sediment and lead. Lead was considered an indicator for other toxic pollutants. High density residential, industrial, multifamily residential, and commercial land uses contributed most of the sediment and lead loads. The Lincoln Creek drainage area was the most important source of toxic pollutants in the Milwaukee South Watershed. There are 24,000 feet of eroding streambank, which produces about 430 tons of sediment each year. Construction sites are another critical source of sediments.

Water Resource Condition

The lower portion of Lincoln Creek has the potential to support a warm water sport fishery, while the upper portions have the potential to support a warm water forage fishery. All sections of the creek have the potential to support partial body contact water recreation.

However, none of the potential uses of the creek are being attained. Recent surveys of the creek have found it to be highly degraded. Only two fish species (fathead minnow and sunfish) were found in the middle portions of the creek in 1992 and both species are pollutant tolerant. Lincoln Creek should support a diverse fish community of at least 15 fish species.

Lincoln Creek is almost entirely channelized, with the channel alternating between concrete and earthen sections. Channel modifications and frequent high storm water flows contribute to the low biological activity observed in the creek.

Levels of petroleum aromatic hydrocarbons (PAHs), heavy metals, fecal coliform and suspended solids, and other pollutants increase significantly during runoff events. Some pollutants, like PAHs, reach levels high enough to exceed water quality standards. Based on EPA criteria, the bottom sediments are moderately or heavily polluted with heavy metals and PAHs.

Crayfish tissue is highly contaminated with PAHs. Mortality was observed in fathead minnows exposed to Lincoln Creek water for more than 15 days. Traditional acute and chronic bioassays did not indicate any toxicity.

Problems in the creek are caused by poor habitat, increased flows, and high levels of pollutant loading.

BMPs, such as wet detention basins, are proposed in the priority watershed plan to address these problems.

Storm water pollution control objectives for Lincoln Creek include:

1. Restore the forage and sport fish communities by improving the habitat and water quality.
2. Improve the recreational uses.
3. Reduce the loadings of pollutants to the Milwaukee River and Lake Michigan.

Watershed Plan

The implementation plan for Lincoln Creek is part of the Milwaukee River South Priority Watershed Plan, which was implemented in 1991.

One of the recommendations in the watershed plan has been implemented—the preparation of a storm water management plan. The storm water management plan provides detailed information about the management alternatives for Lincoln Creek. Critical land uses are identified by watershed instead of the whole drainage area. A major effort is put into determining the feasibility of installing the structural practices recommended in the watershed plan and locating sites for installing the wet detention basins.

Inventory Results

Existing urban land uses, future urban land use, construction sites, and eroding streambanks were the urban sources of pollutants evaluated during the preparation of the priority watershed plan. The inventory of the urban land uses was designed to quantify the acres and the development characteristics of each land use. Existing land use categories were delineated on 1" = 400' scale, aerial photographs were digitized, quantified, and mapped by the Southeastern Wisconsin Regional Planning Commission.

Annual pollutant loadings of sediment, phosphorus, and lead were calculated for existing and planned land uses by running SLAMM. Input parameters for SLAMM included the acres of each land use and the development characteristics, such as the percent connectedness. SLAMM was also used to evaluate the effectiveness of different BMPs on the existing and future urban areas.

Lincoln Creek receives an annual lead loading of about 8,000 pounds. Major land uses contributing to the elevated lead levels are: high density residential (33%), industrial (32%), multifamily residential (14%), and commercial (14%). Future development could increase lead loads by 21 percent. These same land uses also contribute relatively large amounts of other toxicants, such as PAHs and heavy metals.

Runoff from construction sites and streambank erosion annually contribute about 6,500 tons of sediment to the stream. Sediment loads are expected to decrease as the remaining planned areas are developed.

Storm water flows have adverse effects on the creek. High flows cause flooding, bottom scour, and streambank erosion. The Milwaukee Metropolitan Sewage District is evaluating alternative measures for reducing flows in the creek.

Pollutant Reduction Goals

Pollutant reduction goals were based on the needs of the stream. A different approach was taken to establish the reduction goals for each type of problem.

Sediment and Phosphorus

An overall 50 percent reduction in the existing sediment loading is needed to improve the habitat in the creek. Implementation of the storm water pollution control program should reduce the sediment load from construction sites by about 75 percent.

A high reduction of phosphorus (50% to 70%) is needed to reduce the excessive aquatic plant growth in the Milwaukee River and reduce the threat to Lake Michigan.

Storm Water Pollutants

Lead is being used as an indicator pollutant for the other toxic pollutants. Although the State of Wisconsin does not currently use numeric effluent limits to regulate storm water, the pollutant reduction goals for lead were based on meeting the chronic toxicity standards in the Wisconsin Administrative Code. The average annual concentration of total lead in the Milwaukee River exceeds the chronic toxicity standard by 50 percent for surface waters. The proposed pollutant load reduction goal for lead in Lincoln Creek is 50 percent.

By combining the output of SLAMM with a Probabilistic Dilution Model for the creek, the frequency with which the chronic toxicity standard for a number of pollutants is exceeded in Lincoln Creek. The models will assist in determining the amount of reduction needed to significantly lower the probability of exceeding the chronic toxicity standards. The Probabilistic Dilution Model was developed by the EPA and is a good technique for estimating the amount of pollutant reduction needed.

Stream Flow

Specific goals will be established by the Milwaukee Sewage District; however, there are three basic hydrologic goals that must be considered.

1. Maintain baseflow in the creek as much as possible.
2. Reduce stream flows to prevent streambank erosion and bottom scour.
3. Maintain peak flow discharge for 2-year 24-hour storm at predevelopment conditions.

Bottom Sediments

Bottom sediments are heavily polluted. Although a specific reduction goal has not been determined for the bottom sediments, the watershed project has a goal of reducing the levels of pollutant in the bottom sediments.

Management Practices

BMPs are those practices identified in the Wisconsin Administrative Code and are referenced in the Milwaukee River South Watershed Plan to be the most cost-effective controls for storm water pollutants. SLAMM was used to evaluate the effectiveness of wet detention basins, infiltration devices, street sweeping, and roof top disconnection for both existing and future urban areas. Pollution prevention measures were also suggested for controlling construction site erosion and streambank erosion.

Following is a list of BMPs proposed in the storm water management plan.

<u>Best Management Practice</u>	<u>State Cost-Share Rate</u>
Critical Area Stabilization	70%
Grade Stabilization Structure	70%
Shoreline and Streambank Stabilization	70%
Shoreline Buffers	70%
Wetland Restoration	70%
Structural Urban Practice	70%
Street Sweeping	50%

A high level of control is needed to achieve the pollutant reduction goal for lead. All of the critical land uses in established areas would have to be controlled with structural practices, such as wet detention basins or other structural practices.

About 90 one-acre wet detention basins will be needed to treat all the critical land uses in Lincoln Creek. Street sweeping could be used as an interim practice before all the structural practices are built. About 14,000 curb miles of streets would need accelerated sweeping schedules. Twelve one-acre ponds would be needed to treat all the land uses in the planned areas.

Using structural practices in the existing and planned areas would also achieve the pollutant reduction goal for sediment. However, the watershed plan also recommends the implementation of construction site erosion and streambank protection practices. These practices will provide greater than 50 percent reduction before the structural practices are completed.

The watershed plan assumes that an effective construction erosion program will be in place for the cities to obtain cost-share dollars. Erosion control practices standards and applicability criteria should be consistent with those set forth in the *Wisconsin Construction Site Best Management Practice Handbook* (DNR, 1989). Cities in the Lincoln Creek drainage area are required to effectively administer and enforce their existing ordinances.

Control of streambank erosion will require a combination of streambank protection practices. The Cities of Milwaukee and Glendale plan to control peak flows to help protect their streambanks. The Milwaukee Metropolitan Sewage District is preparing a comprehensive stream corridor management approach for Lincoln Creek. The approach will consider flow reduction, alternative approaches for stabilizing eroding streambanks, and rehabilitation of the concrete stream sections.

Construction on the stream corridor will have the most impact on the quality of Lincoln Creek in the near future. Monitoring the proposed project will document the effectiveness of improving the stream corridor. The changes should occur over the

next 3 years, while other practices will take longer to bring about significant changes in the water quality of the creek. Urban education is also a practice recommended in the watershed plan.

Institutional Roles and Responsibilities

Wisconsin Department of Natural Resources

The Wisconsin Department of Natural Resources (WDNR) will have both administrative and monitoring responsibilities for the Lincoln Creek Evaluation Monitoring Project. The administrative role is defined as part of the Department's role in the Wisconsin Water Pollution Abatement Program.

Administration

Administration of the project began by following a selection process. After the project was selected, WDNR worked with Wisconsin Department of Agriculture Trade and Consumer Protection, the cities, and counties to prepare a watershed plan. Implementation of the plan is based on the guidance in the plan.

The Department is working with the Cities of Milwaukee and Glendale to develop cost-share agreements for the practices recommended in the plan. Grant requests will be reviewed by the Department. Interpretation of the State statutes, administrative rules, and watershed plans is provided by the Department.

Financial Support

Financial support for implementation of watershed projects is provided by local assistance agreements and a nonpoint source grant agreement. The cost of implementing all rural and urban practices in the Milwaukee River South Watershed Project is between \$89,000,000 and \$159,000,000. The State share is about \$18,000,000. Installation of the structural practices in existing and future areas in Lincoln Creek will cost between \$36,000,000 and \$74,000,000. The State share of this cost is about \$5,000,000. Total cost of street sweeping each year would be about \$350,000. Development of storm water management plans for Lincoln Creek cost about \$1,000,000. Most of the cost for the implementation of the watershed plan is for the structural practices. State funds are available to cover the State's share of the cost.

Project Evaluation

Project evaluation will involve the collection, analysis, and reporting of information needed to track the progress of the project. The categories of evaluation include administrative accomplishments, pollutant reduction, and water quality improvements. The local units of government will report annually on the progress of core and segmented program activities. Information will also be provided on financial expenditures and time spent on project activities.

Technical Assistance

The Wisconsin Department of Natural Resources provide technical assistance to the local units of government on the design and application of BMPs.

Monitoring Responsibilities

Fish, habitat, and macroinvertebrate sampling will be the responsibility of the Department. Field work will be done by crews supervised by the Department's Bureau of Research.

Stakeholders**Local Units of Government**

Each local unit of government will have a number of responsibilities for the core and segmented programs.

University of Wisconsin Extension

Area extension agents will provide support in developing and conducting a public information and education program.

Milwaukee Metropolitan Sewage District

Sewage districts have all the privileges and responsibilities of cities, villages, and counties when participating in the program.

Landowners and Land Operators

In some situations, private landowners will install practices on their property.

United States Geological Survey

All of the chemical and physical monitoring will be the responsibility of the U.S. Geological Survey (USGS). Peter Hughes will be the project manager for the USGS.

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CHAPTER 3

GUIDANCE ON COMPLETING ADMINISTRATIVE REQUIREMENTS

INTRODUCTION

Chapters 1 and 2 summarized the municipal storm water management program regulatory requirements and guidance for municipal officials to rank storm water management activities for maximum cost effectiveness. This chapter discusses the administrative requirements of a municipal storm water management program. These requirements include public information and participation campaigns, fiscal resources, and annual assessment reports.

Public information and public participation programs are essential to the implementation of an effective municipal storm water management program. The key points to consider in developing this component of the program include creating appropriate goals and objectives, targeting the proper audience, explaining and selling the program to the audience, and having the necessary equipment and staff for proper program implementation. The availability of fiscal resources is another essential component of municipal storm water management programs. Several funding options are available to municipalities: local funding mechanisms, matching fund programs, and grant programs. In addition, to implement an effective program, an assessment of the program must be developed annually and submitted to the permitting authority. This assessment allows the permitting authority and municipality to critique the effectiveness of the program and to make any necessary changes.

PUBLIC INFORMATION CAMPAIGNS

Developing Goals and Objectives

The program's goals and objectives will form the framework for developing public information and participation efforts. Program goals are usually general and should include the essence of a program's purpose. They should also include some measure of the expected outcome. An example goal might be "to protect our watershed by linking and supporting citizens and organizations that are working locally for protection of wetlands and water quality."

Objectives are more specific and should identify actions or activities to be taken at the program-operations level. They focus the broad vision of the goal to something that can be accomplished through organizational resources. An example of an objective is "to publish and distribute four 12 to 16-page wetland journals by June 1, 1994."

To accomplish these goals and objectives, everyone involved in the program must be given the opportunity to participate and contribute and agree on the ideas. To ensure cooperation, the benefits should be explained. Otherwise, goals and objectives will not be important to the staff and will not be considered seriously when implementing the program. Also, because people may interpret goals differently, it is essential to develop the goals and objectives jointly

with the staff through a meeting or other forum that is appropriate in your organization and to make sure that everyone understands them.

Identifying the Target Audience

When developing a public education campaign, it is critical to identify the target audiences and develop materials accordingly. Target audiences are groups that have common characteristics, such as age, culture, socioeconomic background, language, and the educational level of the community or watershed. Learning more about the target audience will assist the staff in developing an effective outreach program. To reach the target audience, you must know specifically who it comprises and what common traits they share. This involves breaking groups down into subgroups that exhibit similar characteristics or traits. For example, construction contractors who are likely to have projects within your municipality or residents who change their own oil can be targeted. Some likely target audiences include:

- Members of industrial categories (e.g., landfills)
- Developers
- Construction contractors
 - Auto repair shop owners
 - Environmental groups (e.g., Adopt-a-Stream, local chapters of Sierra Club, Audubon Society)
- Community groups (e.g., churches, Boy and Girl Scouts, Jaycees)
- Non-English speaking residents
- Outdoor recreation groups (fishermen, garden clubs)
- Homeowners
- Students
- Legislators, other programs and agencies.

Identifying and learning about target audiences allows messages and programs to be developed in a way that will reach and influence these subgroups. The following contacts can provide more information about the target audiences in your community:

- Chamber of Commerce for information on the interests of local business people and what types of materials are most useful to them
- Other government agencies that interact with groups similar to those you will target (e.g., planning department for a list of construction contractors who have received building permits or an economic development department to learn about certain industries)
- Tax records or zoning records to find industrial and commercial facilities
- Wastewater treatment plants for a list of industry types, facility sizes, and potential pollutant sources
- Board of Education to identify ongoing school programs and methods for contributing to school programs and curricula
- Libraries to find local and State magazines and newsletters directed at specific audiences (e.g., environmental and outdoor recreation topics)

- Agency public information and professional associations.

"Selling" the Storm Water Program

Educating the public about a new regulatory program and getting them involved with its implementation are among the most important factors for ensuring program success. Issues such as regulatory deadlines and implementation procedures all depend on educating both the regulated community and the public at large. A key element of the municipal storm water management program is to help communities understand the importance of the storm water program and citizens' participation in improving water quality.

When creating public outreach materials, the storm water management program goals must be clearly communicated and the importance of accomplishing these goals explained. This is especially true in cases where municipalities intend to impose a utility fee for the storm water program. Municipalities may encounter opposition to a new fee if the benefits of the program are not understood. In such cases, it is important to obtain public and political support for the program through education.

One of the biggest political obstacles that municipalities face is that the impacts of polluted storm water runoff may not be obvious. For example, a water body that has been overloaded with sediment from an upstream construction activity may look fine to the casual observer when, in fact, the fish and plant life has been harmed significantly. Once an awareness of both the sources and impacts of water pollution is created, educational programs can be developed to motivate the public to effect positive changes in their daily activities, thereby reducing the addition of pollutants to receiving waters.

Information intended to educate the target audience should include solutions as well as explanations of the issues. Simply providing people with information may not make them change their attitudes and rarely makes them change their behavior. People need to know more about the solutions and action that they can take. Education efforts, therefore, should present the reasons why the program is important and focus on actions that citizens and businesses can take to prevent increases in pollution of storm water. Examples of successful outreach materials that provide information and solutions are included at the end of this chapter.

Developing Outreach Materials

Specific education activities can include disseminating information through flyers included in residential utility bills; interactive methods, such as workshops; open houses at industrial facilities; school curricula materials; or talks or slide shows for schools and community groups. Whichever activities you use, communication should strive to be interactive and allow for feedback to those implementing the program. For example, written materials become interactive when a telephone number to receive further information is provided. Keeping track of the number of callers and the questions they have also provides a way to judge the effectiveness of the materials. Some examples of communication methods that can be used to publicize public involvement are given in the following list:

- TV public service announcement
- TV news story
- Radio public service announcement
- "Freebies (i.e., bumper stickers, magnets)
- T-shirts, hats, etc.
- Workshops

- Radio news story
- Newspaper advertisement
- Newsletter
- Fact sheet
- Pamphlet
- Storm drain stencils (e.g., "Dump No Waste, Drains To Lake")
- Magazines
- Magazine advertisement
- Magazine article
- Billboard
- Community meetings
- Church meetings
- School meetings
- One-on-one personal contact
- "Event" days
- Opinion leaders (i.e., community leaders, parents, teachers)
- Fairs
- Libraries
- Books
- Transit cards (i.e., in buses)

Table 3-1 presents positive and negative characteristics of several outreach options.

Many outreach materials already exist that you may borrow ideas from or incorporate directly into your storm water management program. One particularly good source of public education materials is a guidance manual entitled, *Urban Runoff Management Information Education Products*, developed by EPA Region 5, Water Division, and EPA Office of Wastewater Enforcement and Compliance, February, 1993. This document describes specific materials (booklets, books, bumper stickers, catalogs, citizen action guides, computer software, fact sheets, handbooks, newsletters, pamphlets, posters, slide shows, student activities, and videos) and how to obtain them. It is available from the EPA Office of Water Resources Center, (202) 260-7186.

Outreach materials should use clear, concrete language and, where possible, incorporate graphics. The goal is to design effective materials that people pay attention to, remember, and use. Effective materials should persuade people to behave in a more environmentally friendly manner and to influence others to do the same. The ideas discussed below should help you create interesting materials that will attract public attention, encourage community action, and ultimately make a positive impact on environmental conditions in your area.

When crafting outreach materials, remember to use concrete language that helps people to understand, visualize, and remember information. Here are some tips:

- Do not use jargon or technical, scientific language.
- Use anecdotes and examples. Tell a story to draw your reader in and to add more "human interest."
- Use analogies.
- Use descriptive adjectives and adverbs.
- Use active verbs.

- Try to visualize what you are saying.
- Use graphics to illustrate and highlight what you are saying.
- Describe consequences of action (or no action) in terms of an individual, family, or business rather than using a broader term, such as "the public."

The format and layout of the materials will also influence the readers reaction to the information. Materials should be designed to help the reader find information quickly and easily. An audience that is confused or overwhelmed will be less likely to read and remember the message of the materials. Even though you may have many important points to make, try to avoid crowded pages with small type and little white space. Important information can be highlighted by using bullets, boxes, side-bars, or shading to highlight it. For example, side-bars with the following heads will capture the reader's attention: "Things You Can Do To Help" or "Where to Get More Information." An appealing layout and easy-to-read type will greatly increase the chances that your materials will be read. Special type fonts, bold, italics, or colors can be used for titles, headings, or, occasionally, extra emphasis. A medium-weight type that is large enough, usually 10 point and above, is more easily read. Selected examples of outreach materials that are easy to read are included at the end of this chapter.

Graphics can enhance the program materials by capturing attention and providing a simple visual picture of important information. A good rule of thumb is to keep graphics simple and portray images that the reader shall remember. For example, to influence people to dispose of hazardous waste properly, a person pouring oil down the storm sewer should

TABLE 3-1. CHARACTERISTICS OF SELECTED MEDIA

Media Format	Channel	Pros	Cons
Newsletters	Mail, handout	Can reach a large audience	Printing/mailing is costly
		Can be more technical	Staff time
			Passive, not participatory
Videotape	Workshops	Can reach a large audience	Relatively expensive
	Mail	Visually pleasing	Must be done well
	Cable TV	More participatory	
		Can show behavior	
Public Service Announcements	TV	Free	Sometimes aired at night
	Radio	Can reach a large audience	Competition for air time
		Can target audience	Very passive
			Difficult to evaluate
Mass Media	TV	Can reach a large audience	Constrained by time, space
	Radio	Good for raising awareness	Must be "newsworthy"
	Newspapers	Usually considered credible	Cannot explain complex issues
			Bad for persuasion
Presentations	Workshops	Can be participatory	Reach smaller audience
	Conferences	Good for persuasion	Staff time
	Group meetings	Can show behavior	Can be too technical
		More personal	People may not attend
Exhibits	Libraries	Can reach a large audience	Staff time
	Malls	Visually pleasing	Must be durable
	Fairs		
Freebies (i.e., bumper stickers, buttons, magnets, hats, etc.)	Fairs	Increases awareness	Very short message
	"Event" days	Inexpensive	Weak on persuasion
	Easy to produce		

not be used (even if the text is talking about the hazards of doing so). A picture of a person taking the waste to a proper collection site would be more effective. The following list provides further tips on using graphics effectively:

- Large illustrations are better than small ones.
- Photographs are more effective than sketches.
- If sketches are used, simple, clear, realistic ones are better than cartoons or more abstract drawings.
- A large photo at the beginning of an article draws the reader in.
- Bright colors are useful because they attract our attention.
- Pictures grouped together have greater interest than pictures scattered throughout an article. They can also be used to "tell a story."
- Graphics are especially useful for showing "how to" type information.

Meeting Staffing and Equipment Needs

Consider the resources allocated to your storm water management program. What kind of budget do you have to spend on production and distribution? How much time do you have? How many staff people are available and what are their skills and expertise? Is it possible to get help from citizen volunteers for development and distribution of materials? Producing your communication materials may be a major cost of your program. Make sure that you have enough resources to produce sufficient quantities of your material and to distribute them in your community.

Consider the number of people that need to be reached as a function of the amount of available money. A "cost-per-person" can be calculated by dividing the total cost of production by the number of people being targeted. This will allow comparison of different communication strategies on a cost basis.

PUBLIC PARTICIPATION PROGRAMS

Public education and participation efforts often go hand-in-hand, but public participation may require additional coordination efforts and can present unique challenges to those implementing the storm water management program. The benefits of involving the public in the implementation of the storm water program are many:

- If the public is encouraged to participate in the decisionmaking process of the program, their support for the program will likely increase.
- Large numbers of community members can watch over more of a watershed or municipality than a handful of regulators.
- The public is often the primary source of reports of illicit connections and illegal dumping to storm drains.

- Only the homeowners and residents can implement pollution prevention practices on their residential properties.
- Public volunteer efforts will save staff resources.

With proper training, citizens (e.g., community groups, local colleges, and high schools) can also be included in field screening and sampling portions of the storm water management program. This can possibly reduce the labor required to perform a large-scale dry-weather screening program or at least locate more discharges than could be done by staff alone. In addition, dischargers would be constantly reminded that the public is watching and has access to the system, thereby encouraging compliance with the municipality's management program. To take full advantage of the public participation watchfulness in dry-weather screening programs, municipalities can develop reporting criteria and procedures for the public to follow. The information needs to be clearly stated, public participation should be voluntary, and the city should not be liable if someone is injured in attempting to collect information. The reporting procedures can be similar to crime-watch or fraud-reporting programs and can even include a hotline for the public to report illegal dumping.

Coordination and Integration

Many water quality programs already exist at the local, State, and Federal levels. It is essential, therefore, that storm water management efforts be coordinated with these existing programs so that you are not repeating efforts. By coordinating with other agencies, non-profit groups, industry associations, chambers of commerce, and other citizen groups, you will not only save resources but will also build a coalition of supporters for the program. It may even be possible for your agency to take the lead in identifying all relevant programs and orchestrating them into an effective, comprehensive program with a focus on water quality improvement.

Resources and existing programs do not need to be strictly environmental in focus. For example, in Prince George's County, Maryland, the Police Community Relations Program will incorporate water pollution control information into their outreach program. In this way, the enforcement of water quality regulations will be enhanced through integration between police and water quality specialists.

Program Components

Public participation efforts contribute to the success of the storm water management program by educating other citizens and promoting responsibility for, and interest in, the preservation of water quality. This, in turn, will help generate public and political support for the storm water program. The municipality staff may save certain resources, but will have the added responsibility of communicating with other groups and programs, coordinating and training volunteers, and organizing public events. The following efforts, among others, have contributed to the success of various public participation programs:

- Partnerships with civic organizations, such as with the Boy Scouts and Girl Scouts to stencil storm drains
- Neighborhood representatives to educate their neighbors about the effects of household chemicals, such as fertilizers, herbicides, and cleaners, and alternatives homeowners can use and proper disposal methods
- Citizen watch and reporting programs

- Citizen advisory groups to help create and establish local ordinances
- Household hazardous waste collection days
- Stream and lake cleanup campaigns.

CASE STUDIES

The following pages present case studies of selected municipalities and their public information and public participation programs.

SANTA CLARA COUNTY, CALIFORNIA

The overall goal of Santa Clara County's public outreach efforts is to educate its target audiences about the significance of storm water pollution. The objectives of the program are to elicit public support through volunteer efforts, to encourage changes in everyday chemical usage and disposal habits, and to generate political support for the storm water management program in general. The target audiences include households, small businesses, large industries, educational institutions, private and public waste management programs and facilities, environmental groups, community-based groups, and local governmental offices. Specific education campaigns address:

- Proper disposal of pollutants that would otherwise enter storm drains and channels
- Control of leaks and spills from automobiles, trucks, and storage tanks
- The role of atmospheric emissions in generating nonpoint source pollution
- The need to promote better site runoff and sediment control.

Many of the objectives of the Santa Clara County public information and participation program will be achieved through a combination of activities that are designed to address various interest groups. A number of activities and programs have already been conducted, including the development of a public information participation committee, the development of a public information subcommittee, the development of program logo and stationery, and distribution of a four-color general awareness brochure. Santa Clara County has also developed a storm drain stencil with instructions, a slide show, and poster and convened focus groups to coordinate a nonpoint source educational effort with existing educational programs. Specific action items include:

- Distribution of a storm drain stencil and how-to pamphlet and slide show for use with volunteer groups and general audiences
- Coordination with the Santa Clara County Household Hazardous Waste Program to develop and distribute 1) two pollutant-specific brochures to commercial and industrial audiences and 2) information guidebook for use by the jurisdictions
- Distribution a "how-to manual" explaining storm water management requirements and pollution prevention opportunities at industrial facilities
- Development of educational curriculum to teach students about the impacts of urban runoff and ways to prevent pollution
- Development of media support and advertising to promote public awareness of municipal storm water pollution and for the Santa Clara County storm water management program.

CITY OF SEATTLE, WASHINGTON

The city of Seattle has implemented an education and outreach program designed for each watershed to inform and educate the general public, businesses, and students about the fate of pollutants discharged to the storm drain system and what individuals can do to reduce pollution. The following paragraphs briefly describe some of the major components of the education program.

Schools Education Program

Seattle's extensive school education program includes field trips to an aquarium and a trout farm, videos and films, guest speakers, teachers guides, aquarium displays, and training and equipment for raising salmon in classrooms and releasing the fish into local receiving waters. Development of the program was enhanced by obtaining input from both students and teachers about what kinds of materials would be most interesting and educational.

Consumer Education

The city of Seattle has recruited more than three dozen businesses in the Pipers Creek watershed to display information about caring for the watershed and the proper use and disposal of household, yard, and automotive products. Information is presented in a series of brochures that are displayed in a colorful holder depicting a typical house and its connections to the water through the storm drain and sanitary sewer systems. Each business or service that is hosting a display is given a plaque that they in turn can display to the public.

Clean Water Business Partners

Businesses are mailed invitations to become clean water business partners. To qualify, businesses must earn a certain number of points based on their commitment to clean water. Points are earned by following sound management practices to help protect clean water, hosting information displays, and promoting community activities related to water quality. Each qualified business is presented with a plaque suitable for display certifying that they are a Clean Water Business Partner and honoring their commitment to the environment. The city will bring attention to these businesses through other educational promotions.

Storm Drain Stenciling

Volunteer school and community groups have been recruited to paint a pollution prevention message on a number of Seattle's 30,000 storm drain inlets. The message reads "Dump No Waste - Drains to Stream" and other variations depending on where the storm drain discharges. The program has been expanded through incorporation into the school education program and will likely expand further into a new "Adopt-A-Street" program. To date, more than 5,000 storm drain inlets have been stenciled in Seattle.

Motor Oil Recycling

Motor Oil Recycling is a joint project of the Seattle Drainage and Wastewater Utility (DWU) and the Seattle Solid Waste Utility. Waste oil collection tanks have been placed at 12 auto supply stores located throughout Seattle. The program is publicized by the auto store (Shucks) and by the two utilities. Spin-off programs have been initiated by other auto supply establishments in response to this program.

Waterfront Awareness Campaign

Seattle's downtown waterfront is a major tourist and recreation destination. Litter is a major problem along the waterfront, especially within the water itself. An association of waterfront businesses has initiated a cleanup campaign aimed at improving the appearance of the waterfront. The DWU has joined this partnership and has expanded the message to include the impact of litter and pollution on water quality. DWU recruited youth from the recreation centers around Seattle to paint trash receptacles colorfully with clean water and anti-pollution messages. Signs have been designed by Seattle Aquarium artists and placed along the waterfront reminding people about the effect of their actions on aquatic habitat. Posters similar to the signs will be displayed in waterfront businesses.

Bill Inserts and Citywide Direct Mailings

Seattle utilities include education and public awareness information in their bimonthly billings, which are sent to 188,000 customers. DWU's bill is shared with the Seattle Water Department and the Seattle Solid Waste Utility. The information is distributed on a variety of water quality subjects, including household hazardous waste, protection of Elliott Bay and the Duwamish River, and the school education program. A brochure has been distributed to every customer describing the storm water protection program and the role of the drainage and wastewater utility.

Television Public Service Announcements

Seattle has also developed four television public service announcements (PSAs) for broadcast on local television as part of the education video project in the schools program. The PSAs address the importance of watersheds, the difference between storm drains and sanitary sewers, nonpoint pollution, and pet waste.

MITCHELL CREEK WATERSHED, GRAND TRAVERSE COUNTY, MICHIGAN

Grand Traverse County, Michigan, developed a storm water control ordinance in response to the increase in development the county was experiencing. The primary reason for creating a new ordinance, rather than relying on the old system of Drain Commissioner review of drainage programs, was to establish clear, written guidelines for developers to follow for storm water management.

In writing the ordinance, the Grand Traverse County Drain Commissioner formed the Storm Water Management Advisory Committee. The committee comprised of area engineers, concerned citizens, and officials from the township, county, and state. The committee was split into two subcommittees: a technical committee and a policy committee. The technical committee wrote the technical guidelines for the ordinance and then submitted them to the policy committee for approval. The policy committee made all the final decisions on the ordinance and were assisted by a county-funded environmental planner.

After the ordinance was approved by the committee, the Drain Commissioner took the ordinance to each Township Planning Commission and Town Board for comments and approval. The county then held public hearings, particularly to communicate with some community members who thought the ordinance was unnecessary. The public hearings allowed the county to hear these skeptic's concerns and, in turn, to educate them about the potential impacts to the lakes and streams from soil erosion and additional storm water runoff. The county is convinced that the majority of people now understand the need for this ordinance. After the public hearings, the County Board of Commissioners approved the ordinance and it went into effect January 1992.

The ordinance went into effect with no major problems and has become acceptable practice throughout the community. Many developers are glad that there are finally written guidelines, which make project planning easier. Neighboring counties have been interested in adopting similar ordinances in their communities.

Grand Traverse County also established a program to educate landowners about pollution control on their property and the availability of conservation easements and tax-deductible land gifts through the Grand Traverse Regional Land Conservancy. A citizen committee and the Conservancy assist landowners in permanently protecting the wetlands, streamside greenbelts, and ground water upland recharge areas on their property. The county programs to contact every land owner within the critical areas of the watershed to discuss the various land protection programs offered by the Conservancy. The Conservancy has put together a Mitchell Creek Watershed Landowner's Handbook which covers creek protection issues, watershed care, land protection regulations, and a Mitchell Creek Watershed Map. There will also be a series of workshops to give property owners the chance to learn best management techniques "hands-on."

The county has also targeted areas with streams running through the property, including an elementary school and two golf courses. The county has worked with the Michigan State University Extension Service to assist the landowners in creating buffer zones around the stream and to reduce the amount of fertilizers and pesticides used. At the elementary school, students will participate in planting a buffer zone along the edge of the creek. Where possible, financial assistance is also provided either through public or private grants to cover the cost of planting additional vegetation. These programs are intended to protect the quality of the streams but they also provide education about storm water runoff and watershed protection.

PRINCE GEORGE'S COUNTY, MARYLAND

The goal of the Prince George's County program is to educate the public about water quality, focusing on steps that people can take to improve water quality. The program will identify specific tasks for public participation in the management of water quality. Tailored to the specific community demographics and types of land use, the program may include an array of educational programs dealing with the following topics: lawn care (proper fertilizer and pesticide application), car care (car washing tips proper disposal of oil and antifreeze), recycling, composting of yard wastes, reporting of pollutant spills, landscaping to improve wildlife habitat and water quality, swimming pool care, septic system overflows, use/storage/disposal of household hazardous wastes and toxic material, and animal waste control.

The county has also proposed a number of public outreach programs to involve citizens and industries in watching over their local water resources. Along with public education programs, public outreach programs will be important in storm water pollution prevention efforts. To the extent possible, community groups will be identified to conduct and organize a number of volunteer activities, including tree planting, stream cleanups, road cleanups, biological monitoring, and environmental watch programs to report and stop illegal dumping activities. Environmental activists in communities, citizen groups and Citizen Advisory Committees, industrial coalitions, and schools will all be targeted for various programs, such as:

- Adopt-A-Stream and Adopt-A-Road projects
- Water Quality Hotline
- Pollution contests and projects at area schools
- Recreational opportunities
- Recycling
- Co-op for organic fertilizers
- Wildlife sanctuary delineations
- Wildlife corridors
- Tree planting
- Cleanups
- Award programs
- Household hazardous waste collection.

In addition, communities and public meetings will be held to encourage reporting of illegal dumping into storm drains. The public will also be instructed to watch for industries or other entities that may be contributing unpermitted, non-storm water discharges to the storm sewer. A Water Quality Hotline number is planned that will enable the public to talk to local officials about violations and other water quality problems. This information may then be used in conjunction with local and State investigation and enforcement programs to control illicit discharges to the county's waterways.

Prince George's County has also planned a Community Liaison Service to assist in implementing the storm water management program. The program stresses non-enforcement methods to solve water pollution problems by empowerment and cooperation. County officials will coordinate with various organizations, such as business groups, community associations, environmental groups, Citizen Advisory Groups, schools, to enlist their help in implementing the storm water management program. This coordination will entail notification of programs (stream surveys, watershed surveys, complaints), training of all people interested in any program, and recruitment of volunteers for baseline water quality sampling.

FISCAL RESOURCES

The part 2 municipal permit application requires municipal permittees to demonstrate sufficient financial resources to meet the costs of implementing conditions of the permit. This section provides guidance on some sources of revenue available to permittees.

Selection of one or more revenue sources to fund a storm water management program depends on three factors: (1) type of organization that is operating the storm water management program, (2) amount of money that may be raised by various revenue options, (3) political feasibility of the options, and (4) fiscal needs of the program.

The first consideration when choosing revenue options is to identify options that are legally authorized. This will depend on the type of local government organization used to implement the storm water program. Frequently, storm water programs are set up as storm water utilities and use a variety of revenue options. A storm water utility is a government entity established to design, construct, maintain, and operate a drainage system to control storm and surface water runoff. Utilities handle decisions concerning financing, personnel, and administration. These decisions are not delegated to another governmental department.

Once the legally authorized revenue options have been identified, the second consideration is the amount of money that may be raised and the activities that may be funded by each option. Each revenue source should be examined to determine if the funding is equitable to the consumers. It is critical that the revenue options chosen are able to finance all aspects of the program.

Third, the revenue options must be politically feasible. A successful capital improvement program will select the revenue option, or package of options, that raises the required funding and is most politically feasible.

Revenue may be generated from the sectors of society that will benefit most from the replacement and expansion of the storm water infrastructure. Local governments may levy impact fees on developments for expansion and on redevelopments for upgrading the existing system. Current users should not be responsible for funding the expansion and the replacement of facilities of an existing system. The revenue options chosen should be equitable in meeting the needs for replacement, upgrading, and expansion of the storm water system. Figure 3-1 illustrates the capital and financing process. The figure shows the process by which capital projects are financed in relation to the benefits derived from the projects.

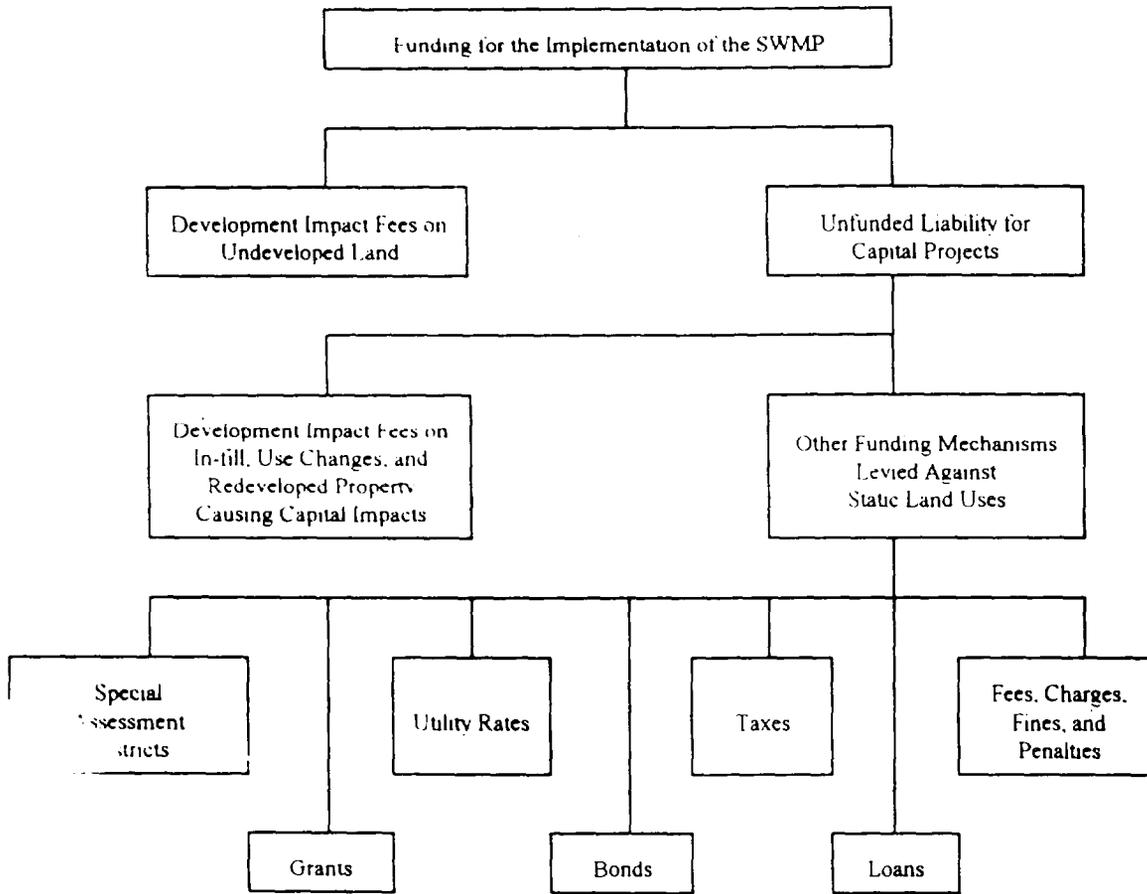


FIGURE 3-1. STORM WATER MANAGEMENT Program—FISCAL RESOURCES*

The following discussion provides an overview of the revenue options identified in Figure 3-1. In choosing a series of options to finance a storm water program, the first step is to determine whether funding is needed for replacing, upgrading, or expanding the system. If funds are needed to finance growth and expansion onto previously undeveloped land, then the authority should assess development impact fees. Development impact fees are assessed against private developers in compensation for the new capacity requirements their projects impose on public facilities.

Development Impact Fees on Undeveloped Land

A significant part of the SWMP is dictated by private development of previously undeveloped property. Additional homes and businesses require service that can only be supported by the construction of new infrastructure (including storm water BMPs). Local governments can levy development impact fees to defray the proportionate share of the infrastructure costs caused by and of benefit to the development. The capital improvement plan should contain sufficient detail to validate such fees.

Unfunded Liability for Capital Projects

Development impact fees will help finance the growth of storm water infrastructure in new developments; however, the upgrading and replacement of the system as it ages still needs to be financed. Local governments need a mechanism to finance the unfunded liabilities, other than continually drawing upon the historical funding sources. One way to help upgrade the storm water infrastructure is by including development impact fees on in-fill,¹ use changes, and property redevelopment. The funds collected can be used to help offset the cost of upgrading an existing system.

Development Impact Fees on Developed Land

Levying development impact fees on properties being redeveloped, in-fill developed, or under changed use must be determined to assure current ratepayers that they are not subsidizing development. When levying development impact fees, there should be a distinct division between replacement and expansion of the system. The component of a project apportioned to replacement should be quantified. The component required for system enhancement to service new customers should be attributed to development impact fees. If the division is not made, current customers may pay for both replacing and upgrading the storm water infrastructure.

Funding of Nondevelopment-Related Project Liabilities

Portions of projects that cannot be legally or accurately charged to development should be financed by revenues paid by existing users of the capital projects. These projects may include the replacement of existing facilities or portion of an upgrade or an expanded plant that cannot be properly be apportioned to development. For example, new

¹In-fill is the cumulative development of single lots scattered throughout the community or the redevelopment of property that results in higher densities or increased demand on public facilities. In terms of storm water management, it includes residential to commercial use changes and an increase in the amount of impervious surface area.

customers should not be expected to pay for replacing a down stream storm sewer line that has deteriorated as a result of age. However, they will be responsible for pipeline enlargement to handle newly increased flows. Methods appropriate for use in financing storm water capital expenditures include fees, charges, fines, and penalties; taxes; utility rates; special assessment districts; debt financing (i.e., bonds and loans); and grants.

Fees, Charges, Fines, and Penalties

Municipal storm sewer operators have discovered that greater revenues may be secured with fewer complaints by separating special services and charges from general services and billing full recovery costs separately for these special operations. In addition, fines and penalties may be used to modify behavior.

Fees

Permit fees may be used to fund the portion of a storm water program that regulates activities of construction and development. Construction permits generate revenue, and they can be used to standardize the construction of new facilities and promote the use of BMPs to limit construction site runoff.

Charges

Special services are those requested and received by a few ratepayers. Utility services for which special fees should be charged include initiation of service, restoration of discontinued service, detection and repair of household leaks, line location, and review of construction plans.

Fines and Penalties

Fines and penalties are an important part of any effective enforcement program. These revenue sources are better suited to modifying behavior than raising revenue. As enforcement improves and the number of violations decrease, revenue from fines and penalties will decline. This is a reflection of an effective program. In some cases, especially in the early years of the program, revenue from fines and penalties are sizeable and may help to finance information/education enforcement and related efforts.

Taxes

Local governments may levy a variety of taxes to fund their programs. The sales tax, property tax, business and occupation tax are the principal sources of revenue for most local governments. While all these tax sources have the potential for financing storm water management programs, in reality, few dollars are available for such programs for two primary reasons: (1) many local governments have utilized all available taxing authority provided by the State and (2) it is difficult to obtain political support to raise taxes in jurisdictions that have not exercised all of their legally authorized taxing power.

Many local governments have used all of their taxing authority and still have difficulty financing their basic programs. In these cases, it is unlikely that local governments will be able to make tax dollars available to fund storm water management programs. In jurisdictions where voters have a strong preference for minimizing local taxes, raising taxes is politically difficult. Thus, while taxing authority may be available, raising taxes to fund storm water management programs may not be a viable alternative.

If taxes are involved, then a tax analysis of the community's ability-to-pay should be performed. In such cases, the jurisdiction that has the power to levy taxes must have a clear understanding of its current and future tax sources. This will help quantify the need in terms of operational, subsidy, fixed-asset replacement, or capital project purposes. With such information, specific tax sources may be identified to finance capital projects, relate benefits to payments, and indicate ability-to-pay.

Utility Rates

Municipalities may choose to form a storm water utility that is funded based upon values of fees charged to users of the storm sewer system. A storm water utility's rate structure should finance the portions of the capital improvement plan that are not the responsibility of new or in-fill development. The portions of utility rates that will fund capital improvements are determined through detailed rate studies. Such studies are conducted to assess the proper payment level for operations and maintenance, fixed asset replacement, and system capital needs that cannot be attributed to development.

Rates are an appropriate mechanism for raising revenue for programs where there is a defined population being serviced. There are two types of rates: (1) unit charges and (2) service charges.

Unit Charges

Unit charges, the traditional types of rates, are calculated monthly and based on the quantity of a product consumed. For example, water and electricity rates are unit rates based on consumption. Utilities have traditionally levied rates in this form. Because it is difficult to measure the amount of storm water discharged by each user, however, storm water management programs do not lend themselves to levying rates based on unit charges. Increasingly, local governments turn to service charges to finance such programs.

Service Charges

Service charges are attractive when users cannot be charged according to their level of use, and services are difficult to price on a unit basis. Most service charges are structured to minimize administrative costs and to ensure that payments approximate the distribution of benefits received. As such, they are viewed as an equitable way to pay for services. Revenue from service charges is predictable and may be substantial.

The storm water service charge is determined through three commonly used methods, each based on the disruption of the natural drainage system. The first is an approximation of the percent impervious surface. Percent impervious surface is a measure of the property that does not allow water to penetrate the ground. This includes roofs, parking lots, and sidewalks. A second method is a flat rate based on the number of residents in a community. The third method assesses a service charge through a combination of percent impervious surface, type of business (SIC classification), and size of the property. Each business type is assigned a runoff factor that reflects the potential discharge of pollutants from the property and a development factor that reflects the percent impervious surface. The product of these two factors is then multiplied by the size of the property in 500 square foot increments. Once the rate is calculated, a fixed fee is added to cover administration costs. A municipality may use a combination of these methods or develop an entirely different method that better suits the characteristics of the community served.

An analysis of the service charge should be conducted annually to update needs, assure continued internal equity, and update cash flows and reserve projections. Computer models may be developed to provide annual rate updates. This

type of operating system deflates potential political and financial problems by small annual rate increases instead of less frequent and more dramatic rate increases.

Special Assessment Districts

For services that cannot be categorized within a utility or fee schedules, a city, county, or utility district with the legal authority may create a special assessment district. Special assessments are levied for infrastructure installation or operations and maintenance. Normally, bonds are issued to finance capital construction that is backed by special assessments levied on district members.

Debt Financing

Financing of capital projects through public utility debt has three major advantages: (1) once the money is borrowed or a bond issued, a fixed interest rate and repayment schedule are established, and the debt is repaid over the years with dollars that are cumulatively deflating in value; (2) individuals who require and will use the facilities being built with the borrowed funds will benefit from the facilities as they use them throughout debt repayment; and (3) debt financing provides large sums of money up front to finance the capital expenditures.

Bond issues and loans are the two primary methods to acquire capital through debt financing. It is important to note that because borrowed funds must be repaid, the ultimate source for repayment of bonds and loans is either taxes or rate revenue. Bonds are not suited to fund ongoing routine expenses, such as the operation of a storm water management program.

Bonds

The two types of bonds commonly used to finance capital acquisitions are general obligation and revenue bonds. General obligation bonds are backed by the full faith, credit, and taxing power of the local government issuing the bond. While a particular revenue source may be earmarked for their repayment, guarantee for repayment of the bonds is provided by the entire stream of tax revenues paid to the local government. For this reason, general obligation bonds may be considered stronger guarantees of repayment than revenue bonds.

Revenue bonds are backed by revenue from a dedicated source as a rate revenue. Because revenue bonds have far fewer statutory constraints, they have replaced general obligation bonds as the primary form of municipal financing. In theory, because this form of debt has its own guarantee (the project revenues, if any), it should not affect a locality's credit rating. In practice, however, revenue debt represents an indirect obligation of the issuing government. Because the lender has only the project revenues to depend on for repayment, interest rates are generally higher for revenue bonds than general obligation bonds.

In most cases, established utilities issuing bonds will issue revenue bonds. New utilities may not have enough history to issue revenue bonds. In these cases, general obligation bonds are issued or, alternatively, double-barreled bonds may be issued. These bonds are backed by both a dedicated revenue source and the full faith and credit of the local government.

Many small communities are unable to enter the national bond market because of poor credit ratings, little financial expertise, and relatively small capital needs. When access to the national bond market is available, small communities usually pay very high interest rates. Some States have created bond banks that enable small communities to issue bonds

through the bank. This provides the small communities access to the municipal bond market at lower interest rates and with lower issuance costs.

Loans

A common loan program available within most States is the State Revolving Fund (SRF) for water pollution control planning. SRFs are intended to create a perpetual source of low cost financing. The funds invested in the capitalization of SRFs assist communities in meeting their needs by providing one-time loans or grants. Below market interest rates are the single most important advantage to some communities. This reduced capital cost decreased the level of user fees required to repay the project debt. The CWA requires recipients of SRF assistance to provide a dedicated source of revenue to cover loan payments. However, SRF assistance to storm water management programs is limited more by state laws than federal restriction. To address this concern, EPA has developed a case study guidebook that presents examples of how expanded use activities can be funded under the SRF program. For more information on expanded uses, refer to EPA, Office of Water, *Funding of Expanded Use Activities by State Revolving Fund Programs: Examples and Program Recommendations*, August 1990, (EPA 43/09-90-006).

Most States have issued SRF loans at interest rates of 2 to 5½ percent below market rates. With the current interest rate being relatively low, the difference between State SRF loans and the market rate may be minimal and, therefore, not as attractive to communities. Similar to the construction grants, some States may require communities to provide a "match" prior to granting the loan. However, economically distressed communities have indicated that they would be unable to pay back a loan even at a zero percent interest rate and must rely on grants for funding.

Grants and Matching Programs

In addition to all the financial methods mentioned previously, States provide grants to communities for their wastewater quality needs. Grants can be in many forms, with or without community matches or use restrictions. Some States, for example, may provide grants to communities to be used as the prerequisite SRF match. Grants are neither a constant or consistent revenue source and should not be seen as an integral part of financing the daily operations of the storm water program. Grants are more likely to be issued for large one-time capital expenditures to assist in reducing the financial burden on the local community.

Table 3-2 lists selected Federal grant programs that can assist in the financing of storm water management needs. The list does not include grant programs available at the State level. The *Catalog of Federal Domestic* (GSA, 1991) contains a comprehensive list of Federal assistance programs.

TABLE 3-2. SELECTED FEDERAL GRANT PROGRAMS

Program Name	Economic Development—Grants for Public Works and Development Facilities
1992 Catalog of Federal Domestic Assistance Number	11 300
Administering Office or Agency	Economic Development Administration, U.S. Department of Commerce
Legislative Authority	Public Works and Economic Development Act of 1965, as amended
Objectives	To promote long-term economic development and assist in the construction of public works and development facilities needed to initiate and encourage the creation or retention of permanent jobs in the private sector in areas experiencing severe economic distress.
Types of Assistance	The basic grant rate may be up to 50 percent of the project cost. Severely depressed areas may receive supplementary grants to bring the Federal contribution up to 80 percent of the project cost; designated Native American Reservations may be eligible for up to 100-percent assistance. Additionally, redevelopment areas located within designated Economic Development Districts may, subject to the 80-percent maximum Federal grant limit, be eligible for a 10-percent bonus on grants for public works projects. On average, EDA grants cover 50 percent of project costs.
Uses and Use Restrictions	Grants can be used for public facilities, such as water and sewer systems, and infrastructure improvements. Qualified projects must fulfill a pressing need for the area and must (1) tend to improve the opportunities for the successful establishment or expansion of industrial or commercial plants or facilities, (2) assist in the creation of additional long-term employment opportunities, or (3) benefit the long-term unemployed and members of low-income families. In addition, proposed projects must be consistent with the currently approved Overall Economic Development Program for the area and for the Economic Development District, if any, in which it will be located and must have adequate local share of funds with evidence of firm commitment and availability.
Eligible Applicants	States, cities, counties, and other political subdivisions and private or public nonprofit organizations or associations representing a redevelopment area or a designated Economic Development Center are eligible to receive grants.
Information Contacts	Director, Public Works Division, Economic Development Administration, Room H7236, Herbert C. Hoover Building, Department of Commerce, Washington, DC 20230.

TABLE 3-2. SELECTED FEDERAL GRANT PROGRAMS (Continued)

Program Name	Economic Development—Support for Planning Organizations
1992 Catalog of Federal Domestic Assistance Number	11.302
Administering Office or Agency	Economic Development Administration, U.S. Department of Commerce
Legislative Authority	Public Works and Economic Development Act of 1965, as amended
Objectives	To assist in providing administrative aid to multi-county districts and redevelopment areas economic development planning and implementation capability and thereby promote effective utilization of resources in the creation of full-time permanent jobs for the unemployed and underemployed in high distress redevelopment areas.
Types of Assistance	A minimum of 25 percent must be obtained from nonfederal sources, except for grants to Native American Tribes. This may be in the form of cash and in-kind contributions. The Secretary is authorized to fund up to 100 percent planning support grants to Native American Tribes.
Uses and Use Restrictions	Grants are used to staff salaries and other planning and administrative expenses of the economic development organization.
Eligible Applicants	(1) Public bodies and other nonprofit organizations representing groups of State-delineated adjoining counties, which include at least one area designated as a redevelopment area by the Secretary of Commerce and one or more centers of growth not over 250,000 population. (2) Native American Tribes, and (3) counties designated as redevelopment areas or nonprofit organizations representing redevelopment areas or nonprofit organizations.
Information Contacts	Director, Planning Division, Economic Development Administration, Room H7023, Herbert C. Hoover Building, Department of Commerce, Washington, DC 20230.

TABLE 3-2. SELECTED FEDERAL GRANT PROGRAMS (Continued)

Program Name	Economic Development—Public Works Impact Projects
1992 Catalog of Federal Domestic Assistance Number	11.304
Administering Office or Agency	Economic Development Administration, U.S. Department of Commerce
Legislative Authority	Public Works and Economic Development Act of 1965, as amended
Objectives	To promote long-term economic development and assist in providing immediate useful work (i.e., construction jobs) to unemployed and underemployed in designated project areas.
Types of Assistance	The basic grant rate for Public Works Impact Program areas is 50 percent, except for Native American areas, where the rate can be 100 percent. Severely distressed areas may receive supplementary grant assistance to bring the Federal contribution up to 80 percent. Local matching share may be waived if appropriate entity can demonstrate that it has exhausted its effective taxing and/or borrowing capacity. On average, EDA grants more than 50 percent of project costs.
Uses and Use Restrictions	Renovation or construction of public works and development facilities to provide immediate jobs to the unemployed and underemployed in project areas.
Eligible Applicants	Eligibility is based on designation of the county or city as a redevelopment area according to the criteria under Section 401(a)(6) of the Public Works and Economic Development Act of 1965 (Public Law 89-136).
Information Contact	Director, Public Works Division, Economic Development Administration, Room H7236, Herbert C. Hoover Building, Department of Commerce, Washington, DC 20230.

TABLE 3-2. SELECTED FEDERAL GRANT PROGRAMS (Continued)

Program Name	Water Quality Management Planning 205(j)
1992 Catalog of Federal Domestic Assistance Number	66.454
Administering Office or Agency	Office of Water, U.S. Environmental Protection Agency
Legislative Authority	Clean Water Act, Section 205(j), as amended
Objectives	To assist States (including territories and the District of Columbia), Regional Public Comprehensive Planning Organizations, and Interstate Organizations in carrying out water quality management planning.
Types of Assistance	Formula Grants. Each fiscal year, the Administrator shall reserve under Section 205(j)(1) an amount not to exceed 1 percent of the amount allotted and available for obligation or \$100,000, whichever is greater, for the purposes of making grants to the States to carry out water quality management planning. Forty percent of the State's annual award must be allocated to Regional Public Comprehensive Planning Organizations and Interstate Organizations, unless EPA approves a lesser amount.
Uses and Use Restrictions	Section 205(j)(1) and Section 604(b) funds are awarded under Section 205(j)(2), to the State water quality management agencies to carry out water quality management planning. States are required to allocate 40 percent of the State's annual award to Regional Public Comprehensive Planning Organizations and Interstate Organizations. EPA may approve a State's request to pass through less than 40 percent if, after consultation with its Regional Public Comprehensive Planning Organizations and Interstate Organizations, the Governor determines that pass through of at least 40 percent will not (1) result in significant participation by Regional Public Comprehensive Planning Organizations and Interstate Organizations unless in water quality management and (2) significantly assist in development and implementation of the State's water quality management plan.
Eligible Applicants	State water quality management agencies.
Information Contacts	Contact the appropriate EPA Regional Office.

ANNUAL REPORTS: ASSESSING THE EFFECTIVENESS OF THE STORM WATER PROGRAM**Purpose of Annual Reports**

On the annual anniversary of permit issuance, the municipality is required to submit an annual report discussing the progress made toward achieving the specified storm water management program goals. As stated in Section 122.42(c) of the regulation:

40 CFR Part 122.42(c)(1)-(7)

The report shall include -

- (1) Status of implementing components of storm water management program that are established as permit conditions.
- (2) Proposed changes to storm water management programs that are established as a permit condition. Such changes shall be consistent with §122.26(d)(2)(iii) of this part; and
- (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under §122.26(d)(2)(iv) and (d)(2)(v) of this part.
- (4) Summary of data that is accumulated throughout the reporting year.
- (5) Annual expenditures and budget for the year following each annual report.
- (6) A summary describing the number and nature of enforcement actions, inspections and public education programs.
- (7) Identification of water quality improvements or degradation.

In developing their Part 2 municipal permit applications, applicants should have considered their strategy for preparing annual reports. While each municipality will take a different approach, in general, strategies will include identification of measures to track the long-term progress of their storm water management program goals, discussion of the role of monitoring data in assessing program effectiveness, and discussion of how the municipality plans to provide for future adjustment to this reporting strategy.

The annual report will be used by the municipality to provide an assessment of the program performance, and guidance in establishing longer term assessment strategies.

The annual report will be used by the permitting authority to monitor program compliance, and determine if the program is achieving the goal of improved storm water quality.

Benefits for Municipality

Completing annual reports is an invaluable exercise for municipalities because it allows them to gather all relevant information from the past year's storm water management activities and to assess the effectiveness of the program to date. If program goals are being met (or are in the process of being met), then the municipality can feel confident that its storm water management program has been designed and implemented in a relatively effective manner. If program goals are not being met, however, the municipality can reassess current program measures and make alterations if necessary. This annual evaluation should help permittees gauge tangible and intangible measures of progress (e.g. pollutant loadings or public awareness).

Benefits for State

Many municipalities are still in the early stages of developing storm water management programs suitable for controlling pollutants in discharges under an NPDES permit; others have relatively sophisticated programs in place. By reviewing the annual report, the State can determine whether various municipalities are developing their programs in a timely manner and can use information gathered in these reports to assess aquatic conditions on the State level.

While the annual report may be used by the States to evaluate municipal compliance with permit conditions, it also may indicate to the permitting authority where permit conditions need to be modified to address specific problems. Access to monitoring data identifying water quality improvements or degradation is important to the State for several reasons. First, it can be used to evaluate the success or failure of a management program in reducing pollutants. Second, it provides the State with information to use in a watershed data base. Third, the State can use the data to meet the informational requirements of various Federal programs. Data drawn from the annual reports will be especially useful for programs such as the Coastal Nonpoint Source Pollution Control Program (CZARA), the Safe Drinking Water Act Program, the Clean Lakes Program (CWA 314), and among others, which are identified in Section 1.3 of this document.

Required Elements

The annual report contains several requirements aimed at evaluating the accomplishments of the past year. This information can be used to evaluate the relative effectiveness of the storm water management program and to determine which elements should be continued or dropped from the program. In some cases, the review will indicate that new methods or measures should be tried. The next several sections appear in the same order as in the permit; however, evaluating them in a slightly different order may be more productive.

Status of Implementing Components of Storm Water Management Program

This section addresses the relative degree to which storm water management program elements have been completed. Numerous approaches can be taken to accomplish this. You may want to begin by providing an overview of the program approach and history. Then, using your permit requirements as a guide, look at each component and decide whether it can be evaluated directly (e.g., pollutant removal) or indirectly (e.g., the success of a public outreach program). To complete this section, you can refer to various documents, including ordinances proposed or enacted, documentation for design or completion of structural controls, inspection reports, site assessments, and progress reports on cleanups. For components that can be directly measured, an effective way to present the information is in a matrix format, as shown in Figure 3-2.

Control Measure Description	FISCAL YEAR									
	July 80	Jan 91	July 91	Jan 92	July 92	Jan 93	July 93	Jan 94	July 94	Jan 95
	1990-91		1991-92		1992-93		1993-94		1994-95	
P-4 Develop and implement an aggressive field program to search for, detect, and control illicit connections with storm drains of sewers which carry sanitary and/or commercial/ industrial wastewater. Planning Preparation Pilot Scale Implementation Full Scale Implementation Evaluation/Documentation										
P-3 Develop and implement an aggressive field program to search for, detect, and prevent dumping or routinely discharging pollutants into storm sewers and drainage channels Planning Preparation Pilot Scale Implementation Full Scale Implementation Evaluation/Documentation										

- Submittal of annual report to RWQCB

NOTE: Schedules for tasks beyond the 1991 - 1992 fiscal year at projected only and will be re-evaluated and revised annually as part of the Annual Reporting Provision in the Permit. Implementation of control measures is contingent with results of planning, preparation, and pilot testing phases. Schedules for specific tasks may vary among the participants according to different conditions and considerations.

FIGURE 3-2. IMPLEMENTATION SCHEDULE FOR PROGRAM ELEMENT IV—ILLCIT CONNECTION ELIMINATION AND ILLEGAL DUMPING ELIMINATION

Figure 3-2 shows activity goals versus activities accomplished. If the component you are addressing is not directly measurable, a narrative description can be given to convey its status. For example, you might describe the effectiveness of a public education program by discussing the number of meetings held to generate community awareness, the results of a post-meeting survey, any followup inquiries or letters from the meetings, or by discussing the increase in the number of citizens reporting violations.

Once you have addressed the circumstances of each program component, the status of the SWMP as a whole should be summarized.

Proposed Changes to SWMP Established in Permit Conditions

After reviewing the effectiveness of your program components over the last year, you can determine which components require adjustments in order to meet long-term goals of water quality improvement. Among the reasons for proposing a change are:

- The existing component is not cost-effective
- The existing component has not performed as anticipated
- Physical circumstances have changed (e.g., the addition of an outfall or consolidation of existing ones)
- New technologies are available that produce better results.

When municipalities make programmatic changes, the background information used to formulate original decisions should be consulted. For example, you should be aware of the initial strategy used to develop the component, such as cost or time constraints. Consider how the initial strategy may have influenced component performance (e.g., lack of funding may have curtailed an activity before the end of the period). The next step is to explain the reason for requesting the change. A detailed description of the proposed component in terms of its impact on budget, schedule, and previously stated program goals should also be provided. For example, Santa Clara Valley's annual report included sections that described successes and shortfalls and future changes as a result of these two areas. All changes must be consistent with regulatory requirements in Section 122.26(d)(2)(iii). Requests for significant revisions to the storm water management program may require municipalities to partially resubmit their storm water permit application, as noted in Section 122.26(d)(2)(iv) and (d)(2)(v).

Revisions to the "Assessment of Controls/Fiscal Analysis" Sections of SWMP

Assessment of Controls

As part of the Storm Water Management Program, municipalities are required to provide an annual "assessment of controls," as well as a "fiscal analysis." This section should be completed only after you have reviewed and summarized the data gathered throughout the year. The municipality will compare the collected data and documented achievements of the program to the estimated data (e.g., reductions in pollutant loading and other site-specific measurements included in Parts 1 and 2 of the permit). Program components will not always meet the anticipated return value and others may exceed expectations. The effectiveness of controls should be modified based on the actual values from data gathered throughout the past year.

A number of control measures cannot be evaluated in terms of direct measures, such as pollutants removed, but instead must be evaluated in terms of indirect measures. Indirect measures can often be very effective when direct measures are not appropriate or when they do not tell the whole story. For example, public education campaigns generally cannot be assessed in terms of pollutant reduction. An increase in the number of citizens participating in a cleanup program, however, would be a good indirect indicator of program effectiveness. Similarly, an increase in the rate of volunteerism within the community could indicate the relative success of a particular program. Another indirect measure might be an increase in the volume of recycling materials collected. An indirect measure of success in lowering pollutant loads would be a lowering in the number of beach closings or fishing restrictions. Be aware of the possibility of these indirect indicators as you review your records.

Table 3-3 contains control activities and possible ways to indirectly measure their effectiveness. Some of these activities may be appropriate for your situation.

TABLE 3-3. SWMP COMPONENTS AND SELECTED MEASURES

SWMP Component	Indirect Measure
Classes/art or writing contests for school aged children	Attendance records, entries received
Public hearings/discussions/seminars	Attendance records
Community cleanup programs or adopt-a-highway campaigns	Number of volunteers or truckloads of trash collected
Public education/outreach programs (e.g., print, video, audio)	Number of handouts distributed, media spots, or citizen response (e.g., phone calls or letters)
Violations reported by citizens	Number and type of violation
Public awareness	Letters, reported violations, court records indicating citizen suits against specific facilities, or a rise in recycling program participation
Household hazardous waste/used oil collection program	Number of gallons of hazardous waste or used oil collected
Industry outreach programs	Increase in the number of permit applications or articles in industry/local publications

Fiscal Analysis

The fiscal analysis section will also be updated based on actual figures for the year past. The information to be updated will include the existing budget, estimated operation costs necessary for the storm water management program during the term of the permit, capital available to meet these costs, and the list of available sources of funding and legal restrictions on these sources. Information for this section and the section on assessment of controls can be presented in a number of ways, including graphs, pie charts, and matrices. When the projected and actual figures differ, the permittee should also include a narrative explanation. For example, if the monitoring program exceeded its budget in a particular area, the permittee may indicate in the narrative that this was caused by the addition of several outfalls that were not included in the original list.

Summary of Data Gathered Throughout the Year

This section of your annual report is used to present an overview of the data gathered during the past year and is an important step in evaluating the effectiveness of your program to date (e.g., data may indicate that efforts to reduce a particular pollutant have been successful). This section should address, at a minimum, the results of the storm water monitoring program and the seasonal pollutant load estimates for each major outfall identified in the application.

Your municipality was required to include, in the Part 2 permit application, a proposed monitoring program for data collection from the separate storm sewer system. The permit issued to your municipality should specify the required monitoring for the permit term. The amount, type, and schedule for monitoring data collection will vary, depending on the proposed program and on the permitting authorities need to characterize the discharge from the separate storm sewer system. The annual report should summarize the monitoring activities for the previous year indicating, at a minimum, the number of outfalls or screening points sampled, the number of times each outfall was sampled, and the location of the outfalls sampled. The annual report should also summarize the data collected in the monitoring program. The monitoring data should be organized by watershed. For example, the results of all monitoring activities for discharges to Smith Creek should be listed together in the same table. The report should include the following information for each outfall sampled:

- The location of the outfall
- The date and time of the sample(s) collected
- The duration and intensity of the storm event that generated the discharge
- The form of precipitation (rainfall or snow melt)
- The type of sample collected (grab, flow weighted composite, or time weighted composite)
- The results of the analysis performed on the samples (e.g., the concentrations of the pollutants).

Monitoring data are best presented in a table or matrix format. Monitoring data can also be given in line graphs, bar charts, pie charts, or other easily understood formats.

Municipalities are also required to submit in their Part 2 applications a schedule for providing estimates of the seasonal pollutant loads and event mean concentration of any parameter detected in any sample collected for the Part 2 application requirements. The proposed schedule will be reviewed by the permitting authority and should be included in the permit conditions. The annual report should present the estimates of pollutant loads and event mean concentrations in the years specified in the permit schedule. The following information should be provided:

- Location of the major outfall
- Estimates for four seasonal pollutant loads for each parameter
- Brief description of method used to estimate the pollutant load
- Estimate of the event mean concentration of each parameter for a representative event
- Brief description of the method used to estimate the event mean concentration.

The estimates of pollutant loads and event mean concentrations should be presented in tabular format by watershed. The description of the calculation methods should indicate the extent to which the monitoring data were used. You may also include a written evaluation addressing the results.

For instance, Santa Clara Valley has a 5-year monitoring program. This program contains 10 monitoring sites, including 5 new sites—an industrial site, two transportation corridors, and two outfalls at a detention basin. The objectives of the program are to:

- Gather data to determine long-term water quality trends
- Assess impacts of toxicity in storm water runoff and determine the pollutants causing the toxicity
- Evaluate the appropriateness of the WQOs in protection aquatic life
- Determine the treatment effectiveness of an existing detention basin under different hydrologic conditions
- Assess the role of stream sediments as pollutant sinks or sources
- Describe the management implications of the findings.

Annual Expenditures and Budget for the Upcoming Year

This section addresses the coming year's proposed budget and the previous year's expenditures. An analysis of last year's budget and actual expenditures is used to determine if targeted amounts in the new budget will be adequate. Note which of your program elements will be continued, which will be dropped, and whether any new ones are to be added. Compare this list of proposed program changes to your available budget to ensure adequate funding. Once you have listed the projected cost for each item, note the source of funding and its approval status. Tracking approval status of funding for planned activities is important because the program may not be able to achieve its goals or permit compliance without funding approval. For example, the Santa Clara Valley Water District (SCVWD) is the managing agency for the municipality's budget. A management committee is appointed to decide on budget matters. The committee is chaired by the SCVWD Manager of Operations and Water Quality and includes representatives from each of the 15 co-permittee municipalities. The nonpoint source division's program manager is responsible for the administration and management of the budget program.

Summary Describing the Number and Nature of Enforcement Actions, Inspections, and Public Education Programs

This section should describe each enforcement action, educational program, or inspection conducted during the past year. This may include actions initiated by citizens, private industry, or the municipality. Refer to legal notices, court records, and newspaper articles for this information. Permittees should note the number and type of each action and, where appropriate, the number of participants or the number of materials distributed (as in the case of educational programs). When addressing enforcement actions, it may be useful to indicate the types of outcome (e.g., the names of offenders published in the local newspapers, the number of fines levied and the amounts, or the number of closures or stop work orders issued). The total number of inspections, the types of facilities inspected, and the number of

violations cited due to these should also be indicated. It may be helpful to note the number of in-house training programs held for inspectors and the number of attendees. Public education programs may be assessed by noting the number of meetings or classes, subject matter, attendance figures, the number and type of media spots, printed materials distributed, etc. In evaluating program success, it may also be helpful to use some indirect measures, such as a decrease in illegal storm drain dumping, which may be attributable to storm drain stenciling. The key to Santa Clara Valley's enforcement program, for example, is the ordinance regulating industrial or other polluting activities within the municipality. The ordinance to be developed by Santa Clara Valley will include language addressing the following activities: controlling non-storm water discharges to storm drains, watercourse protection, regulation of outdoor material storage, control of improper grease disposal, and storm water management requirements for new development and redevelopment. For more specific information on how the ordinance will affect these areas, various subcommittees will develop guidance manuals on storm water controls.

Identification of Water Quality Improvements and Degradation

An important measure of the program effectiveness is the extent to which water quality has improved during the past year. In particular, municipalities should examine the water quality of the receiving waters to which the system discharges. This section should include such changes in receiving water quality and cite the reasons for them.

Municipalities were required to provide information on receiving waters and watersheds in Part 1 of the permit application. This information included a discussion of water bodies cited in State reports required by CWA Sections 305(b), 304(1), and 314(a), the State Nonpoint Source Report, and other reports identifying sensitive watersheds. To complete this section, you will need to review information gathered for these State and Federal programs during the past year and data from the required monitoring program. The municipality may have also gathered receiving water data as part of its strategy for continuing program assessment. In addition, information may be available from other Federal programs, as noted in Chapter 1. Be aware that numerical data are not the only way to determine water quality. One criterion you may use when judging water quality is how well the body of water meets its designated uses (e.g., recreational or industrial uses).

Once water quality improvement has been noted, the next step is to determine the cause for these changes. For instance, if the annual monitoring data indicate that discharge water quality and receiving water quality have improved proportionally, it may be attributable to the successful implementing of the SWMP. If monitoring data indicate an improvement in discharge quality yet receiving water quality has degraded over the past year, you must try to find the reasons (e.g., unforeseen weather conditions, such as flooding or drought, or sources upstream). Available computer water quality modeling programs may be helpful in completing this section.

Sample Annual Reports

An excerpt from an annual report on the Santa Clara County program is given after the summary.

SUMMARY

This chapter discussed the procedures on implementing the specific administrative requirements, which include public participation and public information programs, fiscal analysis, and annual reports. Each of these components is essential to the successful implementation of a municipal storm water management program. Public participation and

public information programs solicit public support by informing individuals of the importance of good storm water management and its effect on water quality. By conducting a thorough fiscal analysis program, a municipality examines all of the available sources of funding and selects the funding option(s) according to its specific needs. The annual report assesses the effectiveness of the management program and allows the municipality to revise the program based on the results of the assessment. The next chapter provides procedures for implementing an effective illicit connections detection program as a key element in the municipal storm water management program and provides examples of programs from different municipalities.

SANTA CLARA COUNTY STORM WATER MANAGEMENT Program

Public Information/Participation Program

Provision 4b of Santa Clara County's NPDES permit requires the individual co-permittees to implement educational control measures to inform the public of and encourage participation in nonpoint source pollution control activities. Educational control measures are being implemented through a Public Information and Participation (PI/P) program.

Overview and Objectives

The main objective of the PI/P element is to implement educational control measures that provide information to the public and increase understanding of and participation in controlling nonpoint source pollution. The overall goals for FY 91-92 were to generate awareness of the program by defining the problem, inform individuals on ways to participate in solutions to the problem, and provide the means for participation. Specific industries were targeted for development of Best Management Practices (BMP) manuals, brochures, and posters. To aid in the development, publication, storage, and distribution of educational materials, the program established a PI/P Subcommittee in FY 90-91 to have primary responsibility for the implementation of this PI/P element.

Program Activities Completed and In Progress

The subcommittee produced nine types of educational material during FY 91-92. This included development and distribution of an Automotive Industry BMP manual and poster, a construction BMP poster, a "Recycle Your Used Motor Oil" poster, brochures describing how to decrease the use of toxic chemicals in the home, guidebooks, and stencils. The storm drain stencils developed in FY 90-91 were made available to co-permittees and volunteer groups to use during FY 91-92, and the remaining brochures developed in FY 90-91 were distributed to the co-permittees as needed. The co-permittees distribute them to the public through presentations, events, direct mailing, and billing inserts. In addition, the subcommittee distributes the materials to the public through presentations and events and to schools, teacher organizations, and specific businesses.

FY 92-93 Program Activities

The subcommittee will continue to be primarily responsible for implementation of this PI/P element, and to act as the central development and distribution point for all materials. The subcommittee will also be evaluating the effectiveness of the PI/P element activities of the past 2 fiscal years and developing recommendations for increasing the outreach effort. Activities planned for FY 92-93 include development of a program newsletter for nontechnical audiences with periodic distribution and development of a brochure for homeowners to use when dealing with contractors who offer potentially hazardous services (e.g., carpet cleaning, pest control). Other activities planned for FY 92-93 are creation and implementation of a distribution plan for program educational materials, translation of one brochure into Spanish, reprinting of existing materials to keep distribution points supplied, provision of funds to support other programs and for the purchase of educational materials produced by other programs in the Nation, development of a strategy for a recognition program for industry compliance efforts, and funding of the San Francisco Bay National Wildlife Refuge's Alviso Environmental Education Center.

Co-Permittee Activities Completed and in Progress

The activities conducted by the subcommittee and the co-permittees for the PI/P element are summarized below. The detailed reports submitted by the subcommittee and the co-permittees are presented in the "Public Information/Participation" Program Element Report.

Infrastructure

The funding, staffing, and organizational/institutional infrastructures established by the co-permittees are summarized in Table 3-4. Of the 15 co-permittees, 6 relied wholly or partially on their general fund for funding of PI/P element activities in FY 91-92, and 10 acquired funding through related program funds, fees, or utilities. Funding for the program element was sufficient for 14 co-permittees in FY 91-92, and 1 reported that the budget was constrained. Staffing for the PI/P element was sufficient in FY 91-92 for nine co-permittees and insufficient, overextended, or limited for six co-permittees. A total of five of the six co-permittees reporting insufficient or limited staff proposed changes to resolve the problem; one indicated no changes would be made due to a hiring freeze. The 4 co-permittees who reported organizational limitations to implementation of the PI/P element identified the problems as establishment of effective communication among departments and difficulties in analysis of activities; 11 co-permittees reported that there were no organizational limitations.

Public Information and Participation Activities

The activities conducted by the co-permittees to meet the objectives of the PI/P element included storm drain stenciling; publication of articles in newspapers, community reports and newsletters, preparation of advertisements for radio and TV; direct mailing of brochures, and distribution of billing inserts (Table 3-5). Brochures and posters were distributed at presentations and special events and were made available at community centers and public office buildings. Some co-permittees provide telephone and mail service to distribute materials on request. In FY 91-92, more than 21,000 storm drains were stenciled, 76 articles and advertisements were published, 238 presentations and events were presented or attended, and more than 77,000 brochures and posters and over 82,000 billing inserts were distributed. The city of San Jose took the lead in producing bookmarks for the co-permittees to distribute to libraries for summer reading programs. Copies of San Jose's co-permittee PI/P activities are attached.

E 3-4. P/P PROGRAM ELEMENT INFRASTRUCTURE

Co-Permittee	Source	ling	Staffing		Organizational Limitations
		Amount	Current	Proposed	
Campbell	General Fund	Sufficient	Overextended	Recruit volunteers	None
Cupertino	Environmental Bill	Sufficient	Sufficient	No changes	None
Los Altos	Sewer Enterprise Fund	Sufficient	Sufficient	No changes	None
Los Altos Hills	General Fund	Constrained	Limited	Hire 1 staff	None
Los Gatos	General Fund	Sufficient	Insufficient	Contract with WVSD	Reorganization of departments
Milpitas	Capital Improvement Program	Sufficient	Sufficient	No changes	None
Monte Sereno	General Fund	Sufficient	Limited	Recruit volunteers for stenciling	None
Mountain View	Wastewater Enterprise Fund	Sufficient	Limited	No changes due to hiring freeze	Coordination between divisions
Palo Alto	Storm Drain Utility	Sufficient	Sufficient	No changes	None
San Jose	Storm Drain User Fee	Sufficient	Sufficient	No changes	None
Santa Clara	Capital Improvement Program	Sufficient	Limited	Hire labor as needed	None
Santa Clara Co.	Existing Programs	Sufficient	Sufficient	No changes	Activity analysis difficult
SCVWD	Water Utility/Flood Control	Sufficient	Sufficient	No changes	Coordination due to physical separation of departments

TABLE 3-5. P/P PROGRAM ELEMENT ACTIVITY SUMMARY

Co-Permittee/Activity	Goals FY 91/92	Accomplished	Goals FY 92/93	Reasons Goals Not Met
CAMPBELL				
Storm drain stencils	200	200	600	Goal met
Newsletter articles	2	2	2	Goal met
Special events	No goals established	2	No goals established	Not applicable
Brochures/poster distribution	1,115	1,120	1,210	Goals met
CUPERTINO				
Storm drain stencil	All catch basins	Complete	Target businesses	Goal met
TV programs	2	2	1	Goals met
Articles in newsletters, newspapers, billings	5	7	2	Goals met
Adopt-a-creek program	Implement program	No	Implement program in 1992	Required additional research
Brochure/posters distribution	No goals established	As needed	Ongoing	Not applicable
Special programs/events	4	4	3	Goals met
LOS ALTOS				
Storm drain stencils	Ongoing (900 total)	200	Ongoing	Not reported
CATV announcements	10	6	12	Display period too long
Advertisements in newsletters, newspapers, billings	12	17	16	Goals met
New programs	1	1	1	Goals met
Brochures/poster distribution	No goals established	4,313	Ongoing	No goals established
Telephone service	500	32	Ongoing	No goals established
LOS ALTOS HILLS				
Storm drain stencils	Access activity	0	Implement alternatives	Aesthetics
Brochure mailing	8,000	8,000	800	Goal met
Brochure distribution	8,000	8,000	Ongoing	Goal met
Advertisement in newspaper	1	1	1	Goal met

Source: Santa Clara Valley Part II Municipal Permit Application

TABLE 3-5. P/P PROGRAM ELEMENT ACTIVITY SUMMARY (Continued)

Co-Permittee/Activity	Goals FY 91/92	Accomplished	Goals FY 92/93	Reasons Goals Not Met
LOS GATOS				
Storm drain stencils	Not reported	Not reported	Not reported	Activity under consideration
News releases	6	Not reported	1+ article	Not reported
Brochure distribution	Not reported	90	0	Not reported
Brochure mailing	Not reported	Not reported	Not reported	Not reported
Brochure availability	Not reported	Not reported	Not reported	Not reported
MILPITAS				
Storm drain stencils	1,500	2,700	3,047	Goal met
Mailings	12,000	0	12,000	Scheduled for 11/92
CATV advertisement	3	3	3	Goal met
Brochure/poster distribution	No goal established	Ongoing	No goal established	Not applicable
Events/presentations	No goal established	0	3	Not applicable
MONTE SERENO				
Storm drain stencils	100%	0	100%	Volunteer program unsuccessful
Presentations	25%	0	25%	Not reported
Video presentation CATV	100%	0	100%	Program did not develop video
Article in newsletter	100%	100%	100%	Goal met
MOUNTAIN VIEW				
Storm drain stencils	1,555	1,127	600	Slowed to involve volunteer community group
Advertisements in newsletters, newspapers	7	5	6	Short reporting period
Brochure distribution	300	2,600	1,000	Goals met

TABLE 3-5. P/P PROGRAM ELEMENT ACTIVITY SUMMARY (Continued)

Co-Permittee/Activity	Goals FY 91/92	Accomplished	Goals FY 92/93	Reasons Goals Not Met
PALO ALTO				
Storm drain stencils	100	750	2,000	Goal met
Brochures/poster distribution	4,400	4,600	6,240	Goals met
Billing inserts	27,000	54,000	54,000	Goals met
Community report	1	0	1	Report space restriction
Advertisements in newspaper, TV	3	2	5	Insufficient staff time to coordinate
Presentations/events	4	6	13	One event canceled due to budget cuts
SAN JOSE				
Storm drain stencils	19,345	15,537	3,808	Not reported
Phone/mail service	1,000	1,200	1,000	Goals met
Brochures/poster distribution	8,100	11,880	6,000	Goals met
Advertisements in radio, TV, newspaper, newsletters, transit	22	22	As needed	Goals met
Special events	14	14	As needed	Goal met
SANTA CLARA				
Storm drain stencils	100% industrial areas 100% other	70% industrial 20% other	30% industrial 80% other	No reported
Advertisements in TV, newspapers, newsletters	5	7	6	Goals met
Phone service	50	50	50% as needed	Goals met
Presentations/events	7	7	As available	Goals met
Brochures/poser distribution	No goal established	As needed	Ongoing	Not applicable

TABLE 3-5. PIP PROGRAM ELEMENT ACTIVITY SUMMARY (Continued)

Co-Permittee/Activity	Goals FY 91/92	Accomplished	Goals FY 92/93	Reasons Goals Not Met
SANTA CLARA COUNTY				
Storm drain stencils	Conducted pilot program	50%	100%	Goal met
Presentations/events	No goals established	5	As needed	Not applicable
Brochures/poster distribution	As needed	4,975+	Ongoing	Not applicable
Advertisements in newspapers, newsletters	As needed	4	As needed	Not applicable
IIFW pilot program	Complete pilot program	8,800 door hangers	Expand program	Goal met
Mailings	No goals established	Not applicable	Develop industry mailing list	Not applicable
SCVWD				
Storm drain stencils	All at district headquarters	All inlets	No goal established	Goal met
Advertisement in newsletters	No goals established	3	4	Not applicable
Presentations/events	No goals established	187	As needed	Not applicable
Calendar distribution	No goals established	1,000	1,000	Not applicable
SARATOGA				
Storm drain stencils	25	240	240	Goal met
Brochures/poster distribution	28,000	30,000	Ongoing	Goals met
Presentation/display/events	No goals established	4	As needed	Not applicable
Advertisements in TV	3	3	3	Goals met
Storm drain stencils	1,000	1,129	1,000	Goal met
Brochures/poster distribution	No goal established	5,865	1,700	Not applicable
Presentations/events	12	9	6	Events rescheduled
Mailings/billing inserts	38,400	38,400	38,400	Goals met
Newsletters, quarterly reports	No goals established	1 report	1 report/as needed	Not applicable

TABLE 3-5. PUBLIC AGENCY CONTROL MEASURES ACTIVITY SUMMARY—PART A

Co-Permittee/Activity	Goals FY 91/92	Accomplished	Goals FY 92/93	Reasons Goals Not Met
CITY OF CAMPBELL				
Street sweeping	5 events/259 miles per month	5 events/261 miles per month	13 events/326 miles per month	Goals met
Catch basin cleaning	As needed	Not reported	284	Not applicable
Conveyance cleaning	As needed	Not reported	12.5 miles	Not applicable
CITY OF CUPERTINO				
Street sweeping	6 events/628 miles per month	6 events/628 miles per month	8 events/628 miles per month	Goals met
Catch basin cleaning	1,420	2,840	2,840	Goals met
Conveyance cleaning	As needed	30 incidents	As needed	Not applicable
CITY OF LOS ALTOS				
Street sweeping	5 events/291 miles per month	7 events/332.5 miles per month	7 events/332.5 miles per month	Goals met
Catch basin cleaning	900	900	900	Goals met
Conveyance cleaning	As needed	None	As needed	Not applicable
TOWN OF LOS ALTOS HILLS				
Street sweeping	As needed	Not reported	No goals established	Not applicable
Catch basin cleaning	250	250	250	Goals met
Conveyance cleaning	5 miles	5 miles	5 miles	Goals met
TOWN OF LOS GATOS				
Street sweeping	23 days/700 miles per month	23 days/700 miles per month	23 days/700 miles per month	Goals met
Catch basin cleaning	500	325	600	Limited staff
Conveyance cleaning	20	20	20	Goals met
CITY OF MILPITAS				
Street sweeping	20 events/390 miles per month	18 events/390 miles per month	16 events/390 miles per month	Goals met
Catch basin cleaning	3000	2172	3000	Limited staff
Conveyance cleaning	85 miles	1.25 miles	4.5 miles	Limited staff

SAMPLE PUBLIC OUTREACH MATERIALS

The following pamphlets and booklets are examples of public education materials that attract attention, are easy to read, and provide steps that the public can take to help improve water quality.

PET WASTE and WATER QUALITY

PUBLISHED FOR THE WISCONSIN PRIORITY WATERSHEDS PROGRAM

Pet-Owners, Take Heed. When you clean up after your pet, do you dump the waste in the street or storm sewer? Do you leave it to decay on the sidewalk or on the grass near the street? If so, you may be causing pollution or health problems.

Are You Polluting Our Lakes and Streams?

Pollutants from improperly disposed pet waste may be washed into storm sewers by rain or melting snow. Storm sewers usually do not go to a sewage treatment plant. Instead, most storm sewers drain *directly* into our lakes and streams, carrying many pollutants along with the water.

Pollutants commonly found in urban lakes, streams and ponds include:

- Sediment
- Pesticides and fertilizers
- Oil and antifreeze
- Toxic chemicals
- Pet waste

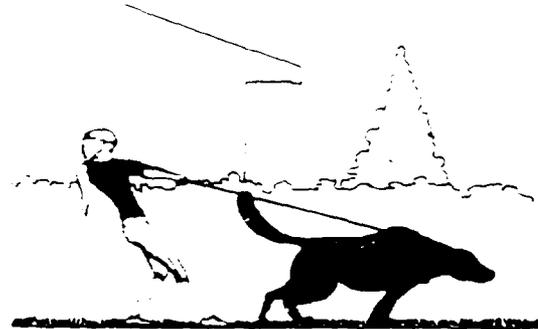
When pet waste is washed into lakes or streams, the waste decays, using up oxygen and sometimes releasing ammonia. Low oxygen levels and ammonia combined with warm temperatures can kill fish.

Pet waste also contains nutrients that encourage weed and algae growth. Overly fertile water becomes cloudy and green—unattractive for swimming, boating and fishing.

Perhaps most importantly, pet waste carries diseases which make water unsafe for swimming or drinking.



About 90% of storm water samples collected recently in Wisconsin creeks had very high levels of bacteria which violated water quality standards for recreational use. Common sources of bacteria include sanitary sewer overflows, pet, and urban wildlife.



Are You Risking Your Health?

When pet waste is disposed of improperly, not only water quality suffers—your health may be at risk, too. Pets, children who play outside, and adults who garden are most at risk for infection from some of the bacteria and parasites found in pet waste. Flies may also spread diseases from animal waste. Diseases that can be transmitted from pet waste to humans include:

Campylobacteriosis—A bacterial infection carried by dogs and cats that frequently causes diarrhea in humans.

Salmonellosis—The most common bacterial infection transmitted to humans by other animals. Symptoms include fever, muscle aches, headache, vomiting, and diarrhea.

Toxocarosis—Roundworms usually transmitted from dogs to humans, often without noticeable symptoms, but may cause vision loss, a rash, fever, or cough.

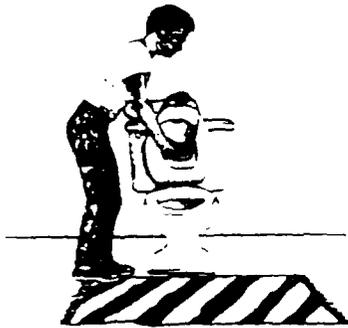
Toxoplasmosis—A protozoan parasite carried by cats that can cause birth defects such as mental retardation and blindness if a woman becomes infected during pregnancy; also a problem for people with depressed immune systems. Symptoms include headache, muscle aches, lymph node enlargement.

Pet waste may not be the largest or most toxic pollutant in urban waterways, but it is one of the many little sources of pollution that add up to a big problem for water quality. Fortunately, there are some simple things we can all do to help keep our water clean. See the other side for ways to keep pet waste out of local waterways.

You Can Make A Difference

Cleaning up after your pet can be as simple as taking a plastic bag or pooper scooper along on your next walk. What should you do with the waste you pick up? No solution is perfect, but here are the choices:

❶ Flush it down the toilet . . .



The water from your toilet goes to a septic system or sewage treatment plant that removes most pollutants before the water reaches a lake or stream.

To prevent plumbing problems, don't try to flush debris such as rocks, sticks, or cat litter. Cat feces may be scooped out and flushed down the toilet, but used litter should be put in a securely closed bag in the trash.

❷ Bury it in the yard . . .



Dig a hole or trench that is:

- About 5 inches deep;
- Away from vegetable gardens;
- Away from any lake, stream, ditch, or well.

Microorganisms in the top layer of soil will break down the waste and release nutrients to fertilize nearby plants.

Be cautious. Keep pet waste away from vegetable gardens and water supplies to prevent disease. Don't add pet waste to your compost pile. The pile won't get hot enough to kill disease organisms in pet waste.

❸ Put it in the trash . . .



This may be easy, but it is not the best solution. Waste taken to a landfill or incinerator can still cause pollution problems.

Check local ordinances. Putting pet waste in the trash is against the law in some communities.

Another option is to install an underground pet waste digester that works like a small septic tank. Before buying one from a pet store, check local laws that may restrict their use, design or location.

A Few Words of Caution

Around Your Home—If you leave pet waste to decay in your yard, be sure it does not become a problem. To prevent water pollution, clean up areas near wells, sewer inlets, ditches, and waterways. Always remove waste from areas where children play. They are the most frequent victims of diseases from pet waste. Of course, the best protection for children and adults is washing hands with soap and water.

In Your Community—Many communities have "pooper scooper" laws that govern pet waste cleanup. Some of these laws specifically require anyone who takes an animal off their property to carry a bag, shovel, or pooper scooper. Any waste left by the animal must be cleaned up immediately. Call your city or village clerk to find out more about local pet waste laws.

A publication of the University of Wisconsin-Extension, in cooperation with the Wisconsin Department of Natural Resources under funding from the Wisconsin Nonpoint Source Water Pollution Abatement Program. Jennifer A. Hill, Intern and Carolyn D. Johnson, Urban Water Quality Educator, UWEX Southeast Area.

University of Wisconsin-Extension is an EEO/Affirmative Action employer and provides equal opportunities in employment and programming, including Title IX requirements.

GW0006 Pet Waste and Water Quality

This publication is available from your Wisconsin county Extension office or from Cooperative Extension Publications, Room 245, 30 N. Murray Street, Madison, Wisconsin 53715. Phone 608/262-3348.



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YARD CARE AND THE ENVIRONMENT



Practical Tips for Home and Yard

A SERIES OF WATER QUALITY FACT SHEETS FOR RESIDENTIAL AREAS

It's an unfortunate fact of urban life—many of our streams and lakes have been polluted. It may be a surprise, however, to learn that water pollution often starts right where you live.

In the community, Urban water pollution begins when development alters natural processes. Removing vegetation and replacing it with streets, rooftops and driveways greatly decreases the amount of water soaking into the soil. As a consequence, the amount of water running off to streams and lakes increases dramatically.

How does the water get from street to stream? Nearly every city street has storm sewer inlets, which open into a network of underground pipes. Leaves, litter, pet wastes, and other materials dumped or washed into storm sewer inlets *do not* go to a sewage treatment plant but flow *directly* to streams and lakes. Also, most storm sewer systems are designed to remove water from developed areas quickly during a storm. This allows pollutants to reach streams and lakes at a "rapid transit" pace.



Looks can be deceiving. Fertilizing the lawn, working on the car, walking the dog and other home activities might seem far removed from water quality. But with gutters and storm sewers, it's as if we all live on a streambank.

Around the home, Our actions around home can either help or harm water quality. For example, rain can wash improperly applied lawn fertilizer and pesticides into lakes and streams. On the other hand, careful landscaping and sound lawn care practices can reduce the need for chemicals and protect water quality.

Similarly, good auto maintenance pays in the long run, but poor auto maintenance can seriously harm our waters. Anything that drips from a motor vehicle—oil, gas, antifreeze—can wash into storm sewers. These materials are toxic to aquatic life. Dumping them into a storm sewer has almost unthinkable consequences. Just five quarts of oil in a stream or lake can create a slick as large as two football fields.

Clearly, there is a need to rethink what we're doing at home if urban waters are to be clean and usable. Fortunately, by following the tips inside, we can all contribute to cleaner water while making our homes and communities more attractive and liveable.



It all adds up. Pollutants washed into storm sewers from dozens of streets and hundreds of homes can become major problems for streams and lakes in a community.

SIMPLE TIPS FOR CLEANER WATER

It really doesn't matter whether you live in the city or the country . . . whether your home is large or small . . . whether you have a lot of time and money to invest in your yard or just a little. There is something you can do to improve water quality. The following suggestions are ways that you can make a contribution to clean water and a healthy environment.

Around your home

- Mow often enough to leave grass clippings on the lawn. Alternatively, use clippings as a mulch or compost them along with leaves that might otherwise "fertilize" local waters.
- Keep fallen leaves out of the streetside gutter or ditch, using them around the yard as practical. Properly place the remainder near the curb (not in the street) just before municipal collection.
- Plant an extra tree for multiple environmental benefits, especially where it becomes part of a planting bed or "naturalized" landscape area that recycles leaves, twigs, and other yard "wastes."
- Seed bare soil and cover it with a mulch as soon as possible to minimize erosion. Disturb no more ground than necessary for a project, while preserving existing vegetation.
- Direct roof downspouts away from foundations and driveways to planting beds or lawns where water can safely soak into the ground. Consider using a rain barrel if practical.
- Use lawn and garden chemicals carefully and sparingly. Pesticides, including weed killers, should be considered a last resort—other controls come first.
- Limit the use of toxic or hazardous products in general. Keep them away from storm sewers, lakes, and streams.
- Collect oil and other automotive products preferably for recycling, or tightly seal and wrap them for proper disposal.
- Wash cars on the lawn, where soapy water can't quickly run toward the nearest storm sewer, picking up other pollutants as it goes.
- Keep cars tuned up and in good operating condition. Check especially for drips and repair leaks immediately to keep nuisance oils off pavement. Better yet, walk, bike or take the bus.
- For waterfront property, grow a "buffer strip" of dense, natural vegetation along the water's edge to filter pollutants and stabilize the shoreline.
- If using a septic tank system, maintain it properly through regular inspections and licensed pumping every two to three years.
- Monitor fuel use from any underground gas and oil tanks to make sure they are not leaking.



- Plan your landscape with environmental health in mind, reducing the area that is heavily maintained.
- Clean up pet wastes, from which nutrients and bacteria could be washed toward lakes and streams.
- Conservatively use salt in winter. Use sand or chip the ice off pavement when possible.

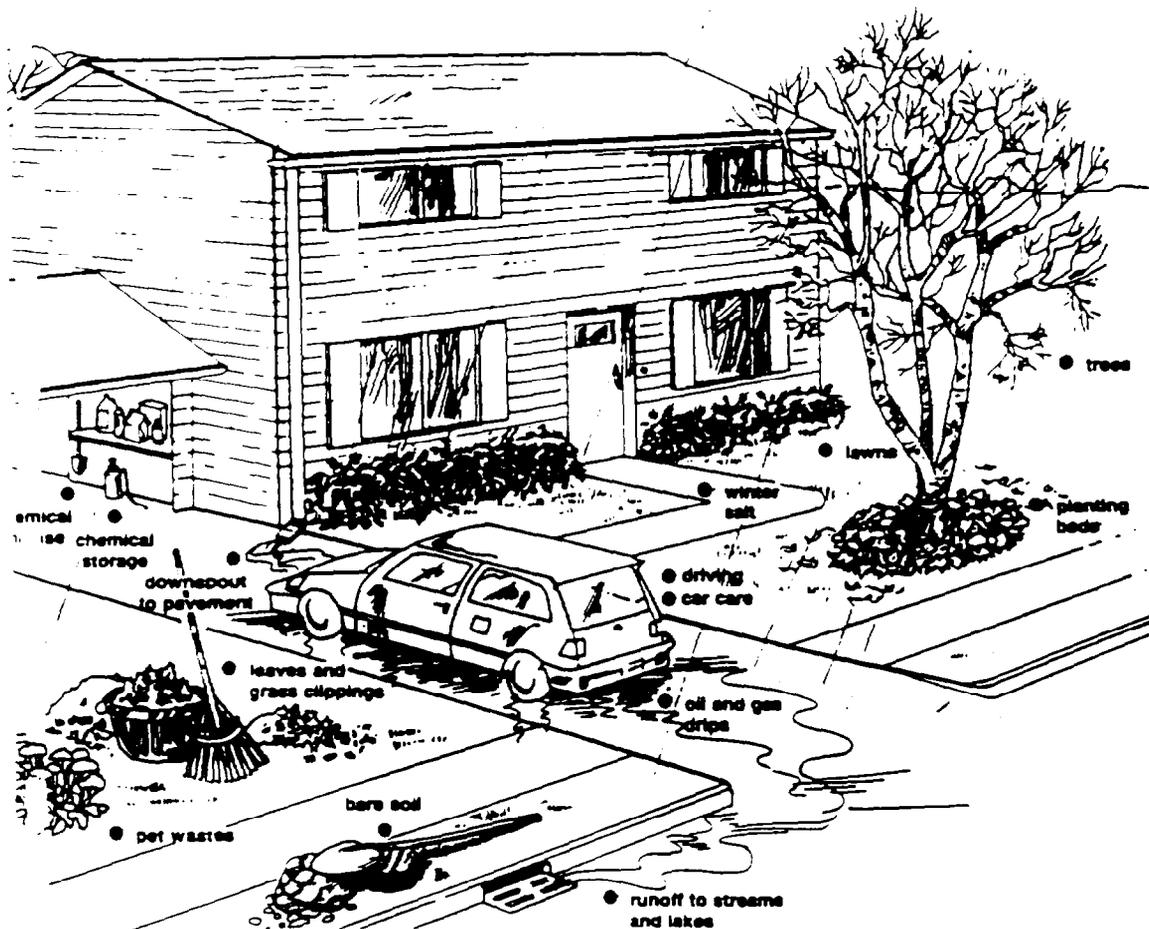
In your community

- Support and follow ordinances that limit soil erosion from construction sites.
- Encourage stormwater management practices that reduce runoff pollution by temporarily holding water in ponds or letting it soak into the ground.
- Encourage the safe but conservative use of salt on roads and limit application to crucial areas.
- Tell public officials about your interest in cleaning up local waters and about their value to recreation and the economy.
- Support the preservation of wetlands as natural filters that protect water quality, prevent flooding, and provide vital open space.
- Promote "environmental or parkway corridors" adjacent to streams and waterways for water quality, wildlife, and multiple-use benefits alike.
- Participate in groups, projects, and events that promote conservation, waterfront recreation, or shoreline clean-ups.

Home Hot Spots for Water Quality

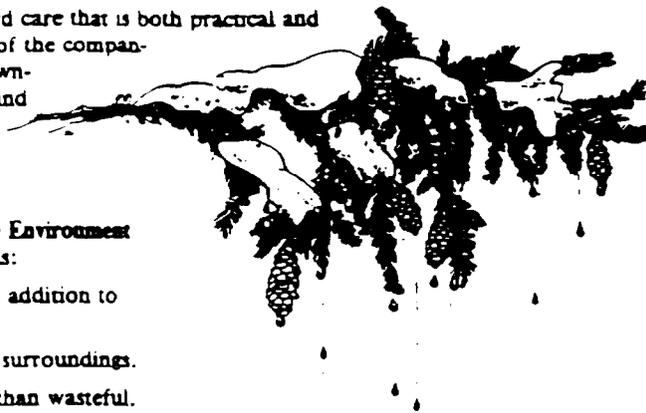
Around every yard are spots where your activities affect water quality. The illustration shows a few of them. Take a look around your own home with an eye toward water quality.

- Good for water quality
- Bad for water quality
- Could be good or bad, depending on your actions



PRINCIPLES OF ENVIRONMENTALLY SOUND YARD CARE

This publication describes an approach to yard care that is both practical and environmentally sound. As a shorter version of the companion piece, *Rethinking Yard Care*, it offers down-to-earth tips for protecting water quality around your home and in your community. Look inside for information on home "hot spots" for water quality.



As stressed throughout the *Yard Care and the Environment* series, environmentally sound yard care means:

- Thinking of environmental consequences in addition to conveniences.
- Planning for greater harmony with natural surroundings.
- Being conservative and resourceful, rather than wasteful.
- Believing that small changes collectively make a big difference.
- Capitalizing on the time and cost-savings that rethinking yard care can bring.

Fact sheets in the *Yard Care and the Environment* series are designed to illustrate principles of environmentally sound yard care. They provide specific information about pesticides, fertilizers, landscaping, watering and related topics. These and other publications can be obtained from your local UW-Extension office, usually located in the county courthouse or another public building. Help is also available there regarding soil testing, pest identification, plant selection and other important items related to yard care and water quality.

A publication of the University of Wisconsin-Extension, in cooperation with the Wisconsin Department of Natural Resources under funding from the Wisconsin Nonpoint Source Water Pollution Abatement Program. Gary K. Korb, Water Quality Education Coordinator, Southeast Area UWEX. Editorial and design assistance from Bruce Webendorfer, Environmental Resources Center, UWEX. Illustrations by Carol Weston.

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GWQ007 Practical Tips for Home and Yard

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LEXINGTON COUNTY

Clemson Extension Service
219 East Main Street
Lexington, SC 29072
159 4265

U.S. Soil Conservation Service
219 East Main Street
Lexington, SC 29072
159 4165

U.S. Agricultural Stabilization and Conservation Service
219 East Main Street
Lexington, SC 29072
159 4205

S.C. Forestry Commission
219 East Main Street
Lexington, SC 29072
159 2415

OTHER OFFICES

S.C. Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
734 5228

S.C. Land Resources Conservation Commission
2221 Devine St., Suite 222
Columbia, SC 29205
734 9100

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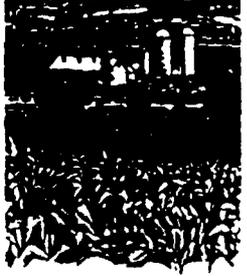
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Agriculture and Home Economics, Act of May 8 and June 30, 1914

Clean Water:

**A
Clear
Choice for
Bush River
and
Camping
Creek**




FOR MORE INFORMATION:

Please call or visit any of these offices:

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Clemson Extension Service
219 Laurens Street
Laurens, SC 29060
984 2514

U.S. Soil Conservation Service
P.O. Box 118
Laurens, SC 29060
984 6921

U.S. Agricultural Stabilization and Conservation Service
221A West Laurens Street
Laurens, SC 29060
984 2741

S.C. Forestry Commission
West Main Street
Laurens, SC 29060
984 7511

NEWBERRY COUNTY

Clemson Extension Service
P.O. Box 160
Newberry, SC 29108
276 1094

U.S. Soil Conservation Service
P.O. Box 434
Newberry, SC 29108
276 0032

U.S. Agricultural Stabilization and Conservation Service
P.O. Box 618
Newberry, SC 29108
276 0000

S.C. Forestry Commission
P.O. Box 129
Newberry, SC 29108
276 1824

(List continued on back panel)

10 WAYS YOU CAN HELP KEEP YOUR LAKE CLEAN.

1. Get Involved Each of us pollutes ground and surface water. Each of us can help save it. Our contributions may seem small, but they join with those of others on the lake. There are nine more ways you can help keep the lake clean.

2. Save Water Saving water will help water quality by reducing the volume of water going through septic tanks. A dripping faucet wastes 20 gallons of water a day and a leaking toilet wastes 200 gallons. Use water sparingly while brushing your teeth, washing dishes, or shaving. Install a water conservation shower head and take short showers instead of baths. A bath uses 40-50 gallons of water, a short shower only 10.

3. Soil Test for Fertilizer Application. Many farmers apply the same fertilizer at the same rate every year. Excessive amounts of nitrogen, phosphorus, or potassium that are not used by the crop leach through the soil and contaminate groundwater. Soil testing allows farmers to determine the exact needs of their fields. This insures optimum yields, a clean groundwater supply, and helps farmers save money by using less fertilizer.

4. Control Soil Erosion. Utilize conservation practices such as conservation tillage and strip cropping to reduce soil erosion. Nutrients and pesticides bond with soil particles. When these particles are eroded into streams and rivers the chemicals are carried with them. Use filter strips near surface water areas and drainage ditches to help prevent water contamination.

5. Practice Sensible Pest and Weed

Control. Apply pesticides and herbicides at the labelled rate. Excessive amounts will leach through the soil and can cause damage to crops and beneficial insects. Make sure pesticide is labelled for the specific weed or insect and the crop to be treated. Do not apply in windy conditions, when rain is forecast, or to other areas as a "precaution."

6. Dispose of Pesticide Containers

Properly. All pesticide containers have a residue of the chemical stored in them. Triple rinsing the containers will remove over 99% of the residue. Use this rinseate in your applicator and be sure to puncture all old containers to prevent re-use. Take the rinsed containers to an approved landfill for disposal. NEVER pour rinseate on the ground!



7. Protect Your Wellhead Area.

Many farmers mix chemicals at or near a wellhead. Any spills near a well can easily contaminate the well water by flowing down against the well casing to the water. Always mix chemicals at least 100 feet from the well. In hilly areas make sure the mixing site is below the wellhead. A concrete pad with low curbs to catch any spills is an excellent mixing site.

8. Manage and Utilize Animal Wastes

Properly. Concentrated animal wastes can chemically and biologically impair water supplies. Maintain lagoons and manure storage areas properly. Apply animal wastes to land to build up soil organics and lower commercial fertilizer costs. Incorporate applied wastes into the soil as soon as possible.

To obtain the greatest nutrient benefit. Do not apply wastes to stream banks or flooding areas.

9. Use Equipment Service Products Wisely

Petroleum products, antifreeze, and battery acid contaminate water supplies just as easily as pesticides and wastes. Capture all used motor oil for disposal or re-use in lubricating chains or blades. Dispose of motor oil and antifreeze at recycling centers. Do not use gasoline as a parts cleaner or weed killer. Never pour oil or gasoline on the ground!

10. Dispose of Household Products

Carefully. Many products under your kitchen sink or in the garbage can harm the water quality. Never pour paints, preservatives, brush cleaners, and solvents down a drain. Sewers or septic tanks do not treat these materials, and they can enter the groundwater untreated. Buy the product with the least amount of toxic material. Used turpentine and brush cleaners can be filtered and reused. Stunt paint cans and other chemical containers with no warning labels are especially dangerous before discarding.



The Lake Haven HVA Project is a group effort of local, state, and federal agencies. The USDA Soil Conservation Service (SCS) is assigned the overall leadership responsibility and also provides technical assistance to landowners. Financial cost sharing funds are provided by the USDA, Agricultural Stabilization and Conservation Service (ASCS), and information and education assistance are coordinated by Clemson University Cooperative Extension Service.

Household alternatives for source control of heavy metals.

Often it is impossible to tell whether a product contains metals or not. Product ingredient lists are incomplete for one reason or another. Gradually this will change as the public demands "green" or environmentally sensitive products and more complete labelling information. In the meantime, research into the contents of household products is continuing, locally and nationally.

Testing conducted by the Washington Toxics Coalition of Seattle and other organizations has shown that certain products contain lower levels of metals than others. The information in this brochure is only a partial listing of products and alternatives, and will be updated and expanded from time to time. And choices don't have to be all or nothing.

Say for example that you have a favorite detergent that contains heavy metals. Try a substitute every second or fourth washload. You'll still be reducing the amount of metals by 25 to 50%—and eventually you may choose to make the substitution completely.

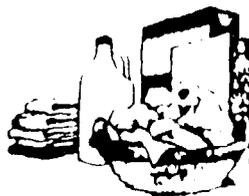
Garden:

Product	Alternative
Root Killer	Crystals that are flushed down the toilet to control the growth of roots in sewer lines may contain copper. Mechanical removal may be an alternative.
Pesticides	May contain copper. Try attracting birds or introducing lady bugs or praying mantis to your garden. For small infestations, wipe leaves or use a high-pressure water sprayer and plain soap.
Weed control	Pull by hand or cover area with mulch, fabric, or plastic.
Fertilizers	Start a backyard compost bin, or use organic soil additives such as peat moss.



Laundry:

Product	Alternative
Detergents	In general, phosphate-free liquid laundry detergents contain lower levels of metals than do powdered varieties. Cheer liquid, Life Tree, Shaklee Liquid 1, and White King Soap contain the lowest metals levels of products tested.
Bleach	Non-chlorine liquid bleaches are lowest in metals. Avoid bleaches containing phosphates. Try less bleach per load, with baking soda added, or presoak heavily-soiled items for 30 minutes in warm water with a half-cup washing soda.
Fabric softeners	Sheets have lower metals levels than liquids. Or add one cup vinegar or a quarter cup baking soda during final rinse.



Dishwashing Detergents	No difference between powder and liquid. An alternative is sodium hexametaphosphate, in same quantity as detergent. Hand-washing detergents have less metals than machine detergents, but do not use them as an alternative in the machines.
------------------------	---

Household Cleaners:

Product	Alternative
Scouring Powder	Dissolve baking soda in water, or sprinkle on surface to be cleaned or on a sponge. Shaklee at Ease liquid and Soft Scrub have lowest metals levels of products tested.
General Purpose	Liquids are generally lower in metals.



Paints & Preservatives:

Product	Alternative
Paints	Avoid oil based paints. Buy latex or water based type. Estimate quantity carefully.
Paint removers	To remove paint from hands, massage with margarine or a few drops of baby oil. Wipe dry and then wash with soap. To strip paint, use a hook scraper, a abrasive block or sandpaper. Clean brushes right after use. Never use gasoline. Soften hard paint brushes in hot vinegar and wash with soap and water.
Preservatives	Avoid products with copper, arsenic creosote. Use decay resistant wood products such as redwood and cedar.
Stains	Use finishes derived from natural sources, such as shellac, tung oil, and linseed oil.



Automotive:

Product	Alternative
Used motor oil	May contain metals; never pour on land or down a sewer drain. San Jose and other cities have curbside recycling pick up; or check with service stations/autocenters. Also, try to buy recycled oil even for high performance autos.
Fluids	Spent antifreeze and brake fluid should be stored properly until they can be disposed of at a hazardous waste collection event.





Cultivate Clean Water!

Fertilizer runoff, eroded sediments, septic wastes and pesticide residues are leading causes of water pollution.

- ★ Have your soil tested; use the right fertilizer at the right time, and don't use more than is needed.
- ★ Use pesticides only when other methods have failed—follow the manufacturer's instructions for use, storage and disposal. Buy only as much as you can use this season.
- ★ Help prevent erosion by planting slopes and resodding bare spots.
- ★ Keep your septic system running properly; keep the tank and leachfield areas clear.
- ★ Don't dispose of trash, lawn clippings, leaves or brush in drainage ditches or on flood control lands.

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CHAPTER 4

PROCEDURES FOR IMPLEMENTING A PROGRAM TO IDENTIFY AND REMOVE ILLICIT DISCHARGES FROM STORM SEWER SYSTEMS

INTRODUCTION

The previous chapters presented information on municipal storm water management program regulatory requirements, guidance for municipal officials to rank storm water management activities for maximum cost effectiveness, and detailed procedures on how to implement specific administrative requirements. This chapter describes the procedures for identifying illicit discharges and implementing illicit discharge programs. Specifically, it discusses the components of an effective illicit discharge detection program, EPA's method for identifying illicit discharges, and examples of illicit discharge programs that have been or will be implemented in different municipalities.

Current interest in illicit connections to storm drainage systems is an outgrowth of investigations into the larger problem of determining the role of urban storm water runoff as a contributor to receiving water quality problems. Water discharge from storm water drainage systems often includes waters from many non-storm water sources. A 1987 study in Sacramento, California, found that almost half the water discharged from the storm water drainage system was not directly attributable to runoff. Illicit entries to the storm drainage system are likely sources of this discharge and can account for a significant amount of the pollutants discharged from storm drainage systems.

Common sources of non-storm water entries include sanitary wastewater, automobile maintenance and operation waste products, laundry washwater, household toxic substances, accident and spill waste streams, runoff from excess irrigation, and industrial sources of cooling waters, rinse water, and other process wastewater. Although these sources can enter the storm drainage system various ways, they generally result from either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the storm drain system or spills collected by drain inlets). Sources can be further divided into those discharging continuously and those discharging intermittently. Table 4-1, presented in *Investigation of Illicit Pollutant Entries Into Storm Drainage Systems* (EPA 1993), gives a simple overview of typical pollutant sources and their most likely characteristics. The table lists the potential sources for illicit pollutant entries into the storm sewer system from residential, commercial, and industrial areas.

TABLE 4-1. POTENTIAL ILLICIT ENTRIES INTO STORM DRAINAGE SYSTEMS

Potential Source	Storm Drain Entry		Flow Characteristics		Contamination Category		
	Direct	Indirect	Continuous	Intermittent	Pathogenic/ Toxic	Nuisance	Clear
Residential Areas							
Sanitary wastewater	X	x	X	x	X	x	
Septic tank effluent		X	X	x	X	x	
Household chemicals	x	X		X	X		
Laundry wastewater	X			X		X	
Excess landscaping watering		X		X	x	x	X
Leaking potable water pipes		X	X				X
Commercial Areas							
Gasoline filling station	X	x		X	X		
Vehicle maintenance/repair	X	x		X	X		
Laundry wastewater	X		X	x	x	X	
Construction site de-watering		X	X	x		X	
Sanitary wastewater	X	x	X		X		
Industrial Areas							
Leaking tanks and pipes	x	X	X	x	X		
Miscellaneous process waters	X	x	X	x	X	x	x

Note: X: most likely condition
 x: may occur
 blank: not very likely

REQUIRED COMPONENTS OF AN ILLICIT DISCHARGE DETECTION AND REMOVAL PROGRAM

The regulations under 40 CFR 122.27 require that the Storm Water Management Programs include "a description of a program . . . to detect and remove . . . illicit discharge into the storm sewer." The regulations further require the following components be included in the program:

- Prohibition of illicit discharges
- Field screening of outfalls within the drainage area
- Investigation of potential illicit discharges

- Spill response and prevention
- Public awareness and reporting program
- Control of infiltration of seepage from sanitary sewers to municipal separate storm sewer systems (MS4s).

Prohibition of Illicit Discharges

Applicants must develop and implement an effective program to prohibit illicit discharges from entering MS4s. This is accomplished through the implementation of inspection procedures, local ordinances, and other legal authorities. In addition to adopting prohibition procedures, a schedule of the implementation process should be developed, and sufficient staff and resources should be allocated. The prohibition of illicit discharges should be linked to legal authority to ensure proper enforcement.

Field Screening

Applicants must propose procedures for a continued outfall field screening program. They can use the procedures from their Part 1 applications or use alternative methods. The field screening procedures in the Part 2 application should identify target areas to be examined for continued field screening and the reasons for selecting these areas. Also, any additional major outfalls recently identified should be included in the Part 2 field screening process. Of particular concern are areas of older development, areas with automobile-related industries, and areas with high concentrations of industrial facilities, among others.

This section should provide a detailed summary of the departmental responsibility for field activities, frequency of inspections, inspection procedures, inspection equipment, and documentation procedures for field activities.

Investigation of Potential Illicit Discharges

Applicants should propose criteria to identify the parts of the MS4 that need investigation. Procedures for investigating likely locations for illicit discharge connections include an MS4 inspection, use of remote control cameras, onsite facility inspections and dye-testing, and additional monitoring to pinpoint pollutant sources. To adequately address these procedures, a checklist should be developed to ensure a comprehensive evaluation of the problem. The checklist should emphasize the use of the easiest, least expensive, and most effective methods for detecting illicit discharges. EPA suggests that a map be developed to supplement the investigation by identifying the illicit discharge locations.

Spill Response and Prevention

The purpose of spill response programs is to reduce the risk of spills to the public. These programs usually require coordination among fire, police, health, and public works departments. The municipal departments responsible for implementing the program should be identified and should address topics such as employee training, reporting procedures, spill containment, storage and disposal activities, documentation, and followup procedures. For each of these elements, particular attention should be given to good housekeeping and materials management practices.

Procedures can be implemented through modification of the land use planning process and ordinance enforcement or through coordination with existing spill prevention or spill containment programs.

Public Awareness and Reporting Program

Applicants should promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges from MS4s. The public awareness program should stress that the public is the beneficiary of this program. Typical public awareness and reporting programs may include developing a hotline number, educating school students, using inserts in utility bills, and media announcements. Effectively implementing these programs should lead to a reduction in the residential discharges noted in Table 4-1.

Proper Management of Used Oil and Toxic Materials

This program component should facilitate the proper disposal of used oil and toxic materials from households, industrial, and commercial users by establishing municipal collection sites or identifying private collection sites. This program should also include any outreach programs for handlers of used oil, as well as the general public.

Control of Infiltration of Seepage

This program component should describe procedures that would control infiltration of seepage from sanitary sewers to MS4s. Some controls to consider for limiting seepage include inspection programs, preventive maintenance surveys, and ongoing infiltration and inflow programs for locating seepage sites. Seepage from malfunctioning septic systems should also be controlled.

EPA'S SUGGESTED METHOD FOR DETECTING ILLICIT CONNECTIONS

EPA's suggested method for detecting illicit discharge connections, developed by the Office of Research and Development, is described in *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems* (user's guide EPA 1993), which is available from the Center for Environmental Research Information, (513) 569-7562. This method focuses on data collection and quantitative analysis to implement a proper illicit discharge connection program.

The user's guide may be used as part of a comprehensive storm water management program that addresses all sources of storm water pollution. Correcting only the most obvious pollutant entries is unlikely to significantly improve the quality of storm water discharges or receiving waters.

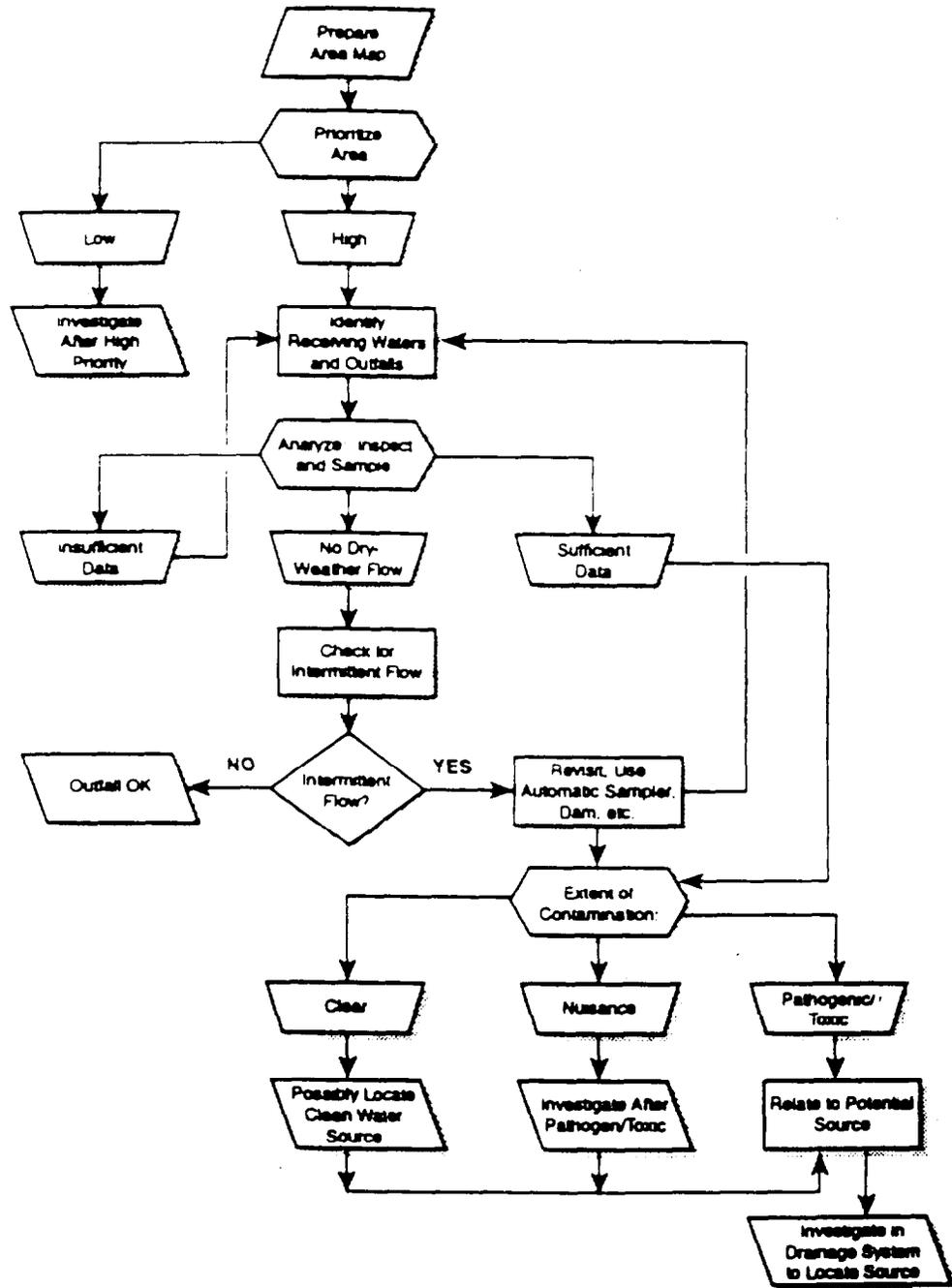
A municipality planning to investigate illicit entries to its storm drainage system needs to base this on local conditions. This user's guide describes the issues and provides examples to facilitate the design of a local investigation.

All the applicable procedures described in the user's guide may be used to successfully identify pollutant sources. For example, attempting to reduce costs by only examining a certain class of outfalls or using illicit testing procedures will significantly reduce the utility of the testing program and result in inaccurate data. cursory data analyses are also likely to result in inaccurate conclusions.

The methodology (appropriately modified) can also be applied to other types of sewerage systems, such as combined and separate sanitary sewerage, to locate illicit entries (e.g., untreated or toxic industrial wastewater/wastes and infiltration/inflow) into sanitary systems

Figure 4-1 presents a flow chart for the methodology for detecting illicit discharge connections.

FIGURE 4-1. SIMPLIFIED FLOW CHART SHOWING THE DETAILED METHODOLOGY CONTAINED IN THE USER'S GUIDE



The initial phase of the investigative protocol includes initial mapping and surveys. These activities require minimal effort and result in little chance of missing a seriously contaminated outfall. More detailed watershed surveys are then performed to locate and correct the sources of the contamination in the identified problem areas. After corrective action has been taken, repeated outfall field surveys are required to ensure that the outfalls remain uncontaminated. Receiving water monitoring should also be conducted to analyze water quality improvements. If expected improvements are not noted, then additional contaminant sources are likely present, and additional outfall and watershed surveys are needed.

The user's guide is designed to provide information and guidance to agencies planning or implementing an investigation of illicit entries to a storm water or wastewater drainage system. This is achieved by:

- Providing a methodology to identify and describe potential sources of non-storm water pollutant entries into the storm drainage system
- Describing an investigative procedure that will allow a user first to determine whether significant non-storm water entries are present in a storm drain and then to identify the potential type of industrial, residential, or commercial sources responsible, as an aid to determining the ultimate location of the source.

Procedure

The user's guide describes the following investigation steps:

- Drainage area mapping
- Tracer identification
- Field survey and data collection
- Analyses of data collected
- Categorization of outfalls
- Investigation and remediation
- Pollution prevention program.

Mapping

The mapping exercise is carried out as both a desktop operation by using existing information and with field visits to collect further data and to confirm existing information. The maps should provide complete descriptions of the drainage areas, including outfall locations, watershed boundaries for each outfall, critical land use areas (mostly commercial and industrial areas), permitted discharges to the storm drainage system, city limits, major streets, and streams. The user's guide discusses critical land use areas and lists major industries and their potential to be non-storm water entry sources.

The drainage areas are ranked in the order of their potential to cause problems. This allows priorities to be set for field investigation of the outfalls. Note that all outfalls will eventually require investigations, and the mapping stage is important because the entire investigation is based on it.

GIS are computer-based tools that can be used to store, display, and analyze geographical information; GIS can be used by municipalities when mapping their storm sewer systems for the purpose of documenting illicit discharge connections. The GIS also serve as a data base to store information about the illicit discharge connections, such as field screening and enforcement activities. If GIS are not being used or are not available to a municipality, then zoning maps, marked with important features (e.g., identification of potential discharge points) can also be used to target potential discharges for identification and further action, as necessary.

Tracer Identification

To detect and identify non-storm water entries, dry-weather outfall discharges are analyzed for selected tracers (e.g., ammonia, surfactant), which are found in the potential contaminating sources. Ideally, the selected tracers should be unique for each potential non-storm water contaminating source and should exhibit the following properties:

- Significant difference in concentrations between possible pollutant sources
- Small variations in concentrations within each likely pollutant source category
- A conservative behavior (i.e., no significant concentration change due to physical, chemical, or biological processes)
- Ease of measurement with adequate detection limits, good sensitivity, and repeatability.

The user's guide suggests tracers for common pollutant sources (e.g., sanitary wastewater, septic tank effluent, laundry wastewater, and vehicle washwater, as well as potable water and "natural waters"). A non-storm water entry investigation may need to select additional tracers specific to potential pollutant sources, especially industries, in the study area (e.g., major ions, specific heavy metals). For each selected tracer, the concentration means and standard deviations in all the potential source flows in the drainage area are needed (use of data from other drainage area investigations is not recommended).

Local data collected on tracers will be essential to identify the contamination sources in the outfall discharge. It is important that the tracer data be accurate. Guidance is provided in the user's guide on representative sampling and on the number of samples required for valid data.

Field Survey and Data Collection

Field investigations are used to locate and record all outfalls, including outfalls not previously identified from the mapping exercise. During field investigations, outfalls are physically inspected and samples are taken of any dry-weather flow for analyses. The field survey should, at a minimum, include:

- Accurately locating outfalls and assigning ID numbers
- Photographing outfalls
- Estimating outfall discharge flow rate (or identifying likely intermittent discharge)

- Physically inspecting and recording outfall characteristics, including discharge odor, color, turbidity, floatable matter (e.g., solids, oil sheen), temperature, deposits, stains, vegetation affected by pollutants, and damage to outfall structure
- Collecting dry-weather discharge samples for tracer analyses of specific conductivity (can be field measured with temperature), fluorides, hardness, ammonia, potassium, surfactants, fluorescence, and pH, as well as other samples, depending on industrial activities.

Intermittent flows will be more difficult to confirm and sample. Additional field visits, use of automatic samplers, and flow damming techniques may prove successful for obtaining samples of intermittent flows.

Analyses of Data Collected

Simple testing procedures are suggested for analyzing the tracer parameters. Except for temperature and specific conductivity measurements, the analyses should be carried out in a laboratory and not in the field to ensure consistent results. The laboratory need not be sophisticated; it can be a room or a trailer set up on a temporary basis.

The recommended analytical procedures for each tracer parameter are based on the following criteria:

- Appropriate detection limits
- Appropriate precisions
- Appropriate resolution
- Low cost, good equipment durability
- Reasonable operator training requirements.

The user's guide also includes guidance on appropriate levels of analytical detection and precision (repeatability) needed to achieve acceptable results.

Categorization of Outfalls

Three levels of outfall discharges are defined: (1) pathogenic or toxic substance pollution, (2) pollution that is a nuisance or threatens aquatic life, and (3) unpolluted.

Pathogenic and toxic pollutants can cause illness upon water contact or consumption. They can cause significant water treatment problems for downstream consumers, especially if the pollutants are soluble metal and organic toxicants. These pollutants may originate from sanitary, commercial, or industrial wastewater non-storm water entries; household toxicant disposal; automobile engine degreasing; and excessive use of fertilizers and pesticides.

Nuisance and aquatic-life-threatening pollutants include laundry wastewaters, lawn irrigation runoff, vehicle washwaters, construction site dewatering, and washing of concrete ready-mix trucks. These pollutants can cause excessive algal growths, tastes, and odors in downstream water supplies, offensive coarse solids and floatables, and noticeably colored, turbid or odorous waters.

Clean water discharged through storm water outfalls can originate from natural springs feeding urban creeks that have been converted to storm drains, infiltrating ground water, infiltrating domestic water from watering leaks, etc.

Outfalls can be classified by comparing the collected dry-weather outfall discharge data with potential sources flow data. At the very least, outfalls with major pollutant sources should be identified for immediate remediation.

Investigation and Remediation

Drainage area investigations to locate the source(s) of non-storm water entries can take a number of forms:

- In-depth watershed evaluation (e.g., evaluate whether sources are likely to be an individual industry or an areawide problem, such as general failure of sanitary wastewater sewers)
- Drainage system upstream surveys (e.g., tracer analyses, visual inspections, smoke and dye tests, and TV surveys to trace the individual sources of the pollutant)
- Industrial and commercial site studies (e.g., identify materials/chemicals used and/or produced and whether the sites discharge to a storm drainage system).

Pollution Prevention Program

The goal of eliminating all non-storm water entries will probably not be achieved completely; however, any action that prevents future entries should be promoted. Typical actions include educating the public (industrial, commercial, residential, and governmental) and developing zoning and ordinances.

Discussion

In addition to these steps, the user's guide provides background information in the form of discussions, tables, and checklists to assist the user in identifying contaminated outfall discharges and potential sources and in using the tracer data to estimate the proportion of each contaminating source flow in the outfall flow.

SUMMARY

This chapter discussed the components of an effective illicit discharge detection program. The presence of illicit discharge connections within a storm sewer system can adversely affect water quality. By implementing an effective illicit discharge detection program, a municipality can identify the source(s) of illicit discharges and take the action necessary to eliminate the discharges. Before the development of an adequate illicit discharge detection program, however, municipalities must identify the available fiscal resources, assess the public's knowledge of water quality issues, and develop an SWMP that will successfully complement the illicit discharge program. This chapter presented the components of an effective program, EPA's method of detecting illicit discharges, and detailed examples of programs from various municipalities. The components of an effective program include a mechanism for prohibiting illicit discharges, field screening, investigation of potential illicit discharges, spill response and prevention procedures, public awareness and reporting program, used oil/toxic materials

management and disposal procedures, and methods to control infiltration from sanitary sewers to storm sewers. Within these components, the use of GIS for mapping illicit discharge connections and for maintaining a data base of information on illicit discharges throughout the municipality is essential. EPA's method for detecting illicit discharge connections is discussed within the user's guide. This method relies on the quantitative analysis of dry weather flows to identify the pollutants within illicit discharges. This information is then used to locate the potential source(s) of the discharges.

CASE STUDIES

The following case studies provide information on the various ways illicit discharge programs can be developed and implemented. These municipalities have incorporated the components of an effective program in ways that are most effective to their specific needs.

FORT WORTH, TEXAS

In 1985, the Fort Worth Public Health Department (Health Department) developed and implemented a unique program for detecting illicit discharge connections to its MS4s. The program, known as the Drainage Water Pollution Control Program, focuses on empowering people to take action against illicit dischargers and places less emphasis on excessive data collection. As a result, Fort Worth's program is cost efficient and ensures corrective compliance. The four components of Fort Worth's program are:

- Problem detection
- Source investigation
- Correction of problems
- Prevention of problems

Problem Detection

The Health Department identified three means of detecting surface water contamination: (1) a drainage water quality assessment and monitoring program, (2) a biotoxicity testing method, and (3) a program for determining the concentrations of six metals in drainage sediments.

Assessment and Monitoring

The drainage water quality assessment and monitoring program examines the types of discharges entering a receiving water body (Trinity River). To properly assess the affect these discharges have on the water body, the Health Department thinks it is essential to monitor the discharges over an extended period of time. The monitoring technique used, however, is not one of quantitative analysis but relies mostly on visual observation of the outfalls or drainage ways. From its observations, the Health Department concluded that the presence or absence of persistent features (e.g., vegetation, animal life) at an outfall are directly related to water quality. Even though persistent features are a direct indication of water quality, one has to know which features are associated with good water quality and vice versa. One indication of a healthy waterway is the presence of a variety of plant and animal life; unhealthy waterways have little or no plant and animal life.

The assessment and monitoring phase of this program is based on detecting subtle changes in the waterways from frequent observations and by the use of modified versions of conventional chemical tests. The Health Department's methodology does not readily utilize consulting firms or laboratories to determine if a problem exists; however, if exact determinations are required, then the services of the aforementioned are solicited.

The Health Department chose 24 drainage outfalls and one control site for monthly water quality monitoring to assess the presence or absence of the undesirable features in the outfalls. Undesirable features include filamentous sewage bacteria, mosquito larvae, fish kills, water color, water odor, water clarity, water pH, oil sheen, floatable solids, and positive water tests to Nessler reagent. The information gathered from the monthly monitoring is recorded on data sheets. The data are compiled from all of the sites and displayed on a table with a 45-month profile. The occurrence and persistence of undesirable features indicate the impact that outfall drainage has on the Trinity River and the effectiveness of correction and prevention measures within the program.

Biotoxicity Testing

The 24 drainage outfalls are then subjected to biotoxicity testing. The purpose of the testing is to determine the presence of toxins in the waterway, the hazard level created by the toxins, and the source of the toxins. The object of the test is not to define the properties of toxic substances. Instead of a laboratory biotoxicity test, the Health Department conducts in-situ toxicity tests. Native aquatic species are used to assess the environmental affects of the toxins on the waterway habitat. The use of native species is key because they are accustomed to the environmental characteristics of the ecological region. To test these species, the Health Department used homemade minnow buckets which are floating, ventilated, transparent combiners used to hold test organisms. The test is also used to examine the water contamination.

Metal Testing

In addition to biotoxicity, the 24 sampling sites are analyzed for 6 metals. Water and sediment samples are collected for the following metals: cadmium, chromium, copper, lead, nickel, and zinc. To establish a basis for comparison, three nonpolluted background sampling sites were chosen to reflect the natural occurrence of these six metals within the waterway. The samples are analyzed according to the protocol within Standard Methods for the Examination of Water and Wastewater.

Source Investigation

After the detection of a drainage source of pollution, an investigation follows to determine whether the source of the problem is known or unknown. If the source is known, then the responsible party is connected, and action is taken to stop the discharge as soon as possible. The notification is done by a pollution control officer or other designated official. Unknown sources are traced back from the detection point to the source. The Health Department has a specially trained Storm Tunnel Investigation Team to trace illicit discharges through the sewer system to the source. The Health Department uses the following tools for source investigation: Storm Tunnel Investigation Team; a safety equipment Step Van; biotoxicity testing devices; fluorescent dyes and smoke generators for obscure tunnels and leaks; water evaluation equipment; Federal, State, and local regulations; and drainage maps.

All investigative activities are documented with photographs, reports, and samples. Required sampling is done according to Standard Methods and is handled through the chain of custody procedures specified by the legal authority. Other important information recorded during the investigation include time and date of the violation and investigation, location of the violation, location of the responsible party, name and telephone number of the responsible party and witnesses, description and results of any tests conducted during the investigation, and the name(s) of the investigator(s). All of this information is recorded on a Discharge Report Form.

Correction of Problems

The Health Department's approach is to correct the problem at the source, instead of the typical "end-of-the-pipe" treatment. Correcting problems at the source is essential because the drainage way below the outfall improves and the responsibility is placed on the pollution generator and not the municipality. Fort Worth notifies the responsible party, explains the violation(s) and the need to make corrections, issues time-dated notices on when to make corrections, and checks the violator's progress. If the pollution generator refuses to make corrections, then legal enforcement agencies (e.g., EPA) are notified.

Prevention of Problems

In addition, the Health Department uses a strategy of "concentric containment." Concentric confinement includes the recognition, containment, and resolution of existing illicit discharge connections to prevent their spread to other areas of the city. To achieve this, the Health Department conducts weekly "roving patrols" of various city sectors and critiques the development programs of new industries and businesses. Public education programs (e.g., videotapes, workshops) are also available to community groups, schools, and other regulatory organizations.

To receive more information about Fort Worth's program, contact Gene Rattan at (817) 871-5463.

CHARLOTTE, NORTH CAROLINA

In Charlotte, North Carolina, controlling illicit discharges is an important issue. In conjunction with Mecklenburg County, Charlotte is in the process of developing an extensive program for detecting and removing sources of illicit discharges. A discussion of the components of Charlotte's illicit discharge connections program follows.

Ordinances

Presently, Charlotte does not have an ordinance prohibiting illicit discharges into storm sewers or surface waters. However, the city is proposing an ordinance that will prohibit plumbed-in connection, intermittent discharges, and the dumping of trash and wastes (hazardous and nonhazardous) into surface waters. Other aspects of the ordinance will define non-storm water discharges and address the enforcement process, penalties for violation, and due process for appeals of violations. The development effort will be coordinated with Mecklenburg County's ordinance and will occur during the first year of the permit. The cost is estimated to be about \$11,300.

Field Screen

Charlotte's proposed field screening program will result in a one-time visual field screen of every outfall in the city. The program will specifically address improving the efficiency of field screening methodology; a one-time visual screen of all outfalls; field screening of problem area outfalls; continuation, support, and expansion of Mecklenburg County's Stream Walk program; and maintenance of a GIS storm water data base.

Field Screening Methodology

To improve the efficiency of the field screening methodology, Charlotte takes a two-phased approach. Phase one will utilize the observation protocol used in the Part 1 application process. Observations will be made for the presence of dry weather flow, color, turbidity, and oil sheen. Phase two will identify sources of the illicit discharges and ensure compliance with the illicit discharge ordinance. The cost of this program is \$10,000.

One-Time Visual Field Screen

Charlotte is in the process of developing a storm water utility, which includes a preventive maintenance program for the storm water collection infrastructure. The storm drainage system is currently being inventoried. As part of this effort, Charlotte has initiated a 2-year, one-time visual field screen for dry weather flow of all outfalls. The cost of the program is \$8,000 per year.

Problem Area Outfalls

As part of field screening the problem areas, Charlotte and Mecklenburg County investigated known water quality problems throughout the municipality. The city was broken down into polygons, which represented

neighborhoods, land uses, and stream segments. These polygons were then prioritized on the types and magnitudes of the problems. To address the problems identified in the investigation, the city will be divided into zones and each zone will be assigned a zone team. This will be implemented in the second year of the permit and costs \$130,000.

Mecklenburg County Stream Walk Program

The Mecklenburg County Department of Environmental Protection (MCDEP) sponsors a Stream Walk program. The participants in the program are volunteers from the county, Charlotte, and other surrounding counties. The volunteers are split into teams and assigned a resource person from the MCDEP staff. They walk streams that are affected by point and nonpoint source pollution and are responsible for investigating and determining the pollutant source(s). The weaknesses of the program, to be addressed by Charlotte and MCDEP, are available personnel, volunteer motivation, volunteer training, and public education. The program will cost approximately \$36,000.

GIS Data Base Maintenance Program

A GIS data base will be used to track all field screening activities. The results of initial and follow-up field screening will be entered into the data base and used to identify the problem areas. The program is currently in use and the estimated cost is high.

Follow-up Investigation

The program tries to identify and remove all sources of illicit discharges by enhancing MCDEP's current program. The only two possible improvements to the program are to add more staff and to computerize it. Charlotte will be:

- Developing follow-up program procedures
- Developing and implementing a training program
- Implementing the follow-up procedures
- Maintaining a GIS data base.

Follow-up Procedures Development

The follow-up procedures will respond to the problems identified by the visual field screenings, MCDEP's Stream Walk, MCDEP's monitoring programs, problem area investigations, and citizen complaints. The areas to be addressed will be prioritized based on the urgency and magnitude of the problem. Teams will be assigned to the problem areas and are responsible for the determination and elimination of pollutant sources. To accomplish this task, the teams have to review existing data on the area, perform field reconnaissance, locate and identify problem sources, perform source identification methods (e.g., video, smoke, and dye testing), distribute violation notices, perform other enforcement actions, and notify higher authorities when appropriate. The program will be implemented during the first year and will cost \$22,200.

Training Program

The training program for the follow-up investigations team will be developed with the training programs for industrial and related facilities. Charlotte will also coordinate the development of this training with supervisors of MCDEP's Stream Walk and Charlotte Mecklenburg Utility Department (CMUD). The training will address the reconnaissance follow-up methods (e.g., observation techniques, chemical screening), detailed follow-up methods (e.g., closed circuit television, dye and smoke testing), and enforcement methods. Training should begin in the middle of the first year and is estimated to cost \$23,100 over the 5-year period.

Follow-up Procedures Implementation

During field investigations, the follow-up teams will identify sources of illicit discharge connections using the prioritization system and the follow-up procedures. This will begin in the second half of the first year and will cost \$50,000 annually.

GIS Data Base Maintenance

All of the information, including information on violations, received during the follow-up investigations will be entered into a GIS data base. This data base will be used to track repeat offenders and to produce annual reports to be presented to the State. The data base will cost approximately \$14,000 per year.

Spill Response Program

The objective of the spill response program is to prevent and respond to spills. The existing program is well developed; therefore, Charlotte will only enhance the public education and awareness aspect of the program. In Charlotte, the Fire Department is responsible for the spill response program and maintains a Hazardous Materials (HAZMAT) team. The city will review the types of spills and their causes in order to minimize the risk to storm systems and surface waters. The public education and awareness component will educate people on the illicit discharge connections ordinance and encourage public reporting of spills. This program, which has an estimated cost of \$30,000, will begin immediately.

Public Reporting Program

The objective of this program is to increase and improve public reporting of spills and improper disposal. The program will focus on public education and information to inform the public of the importance of reporting spills and illicit discharges. This program will be coordinated with other public education programs and will include information on:

- Charlotte's overall storm water management program
- The importance of the illicit discharge connections component

- Charlotte's illicit discharge connections ordinance
- Proper disposal and recycling programs
- The purpose of stenciling catch basins.

In addition, the program will:

- Publicize Charlotte's storm water hotline
- Encourage the public to readily report signs of illicit discharges
- Urge the public to participate in MCDEP's Stream Walk.

Information will be disseminated through public speaking, distribution of written materials at civic functions, participation of neighborhood groups and associations, and local media announcements. This program will begin immediately with an estimated cost of more than \$70,000.

Used Oil/Household Hazardous Waste Program

The objective of this program is to properly dispose of and manage used oil and household hazardous waste. Charlotte will address this problem with public education and changes to existing programs. The program will include used oil recycling, permanent household hazardous waste program, and a review of the current small quantity generators.

Used Oil Recycling Program

The used oil program is currently based on extensive public education. The components to revise/expand this program include:

- Review of the public and private facilities that accept used oil and a determination of *additional facility* locations
- Review of the existing Mecklenburg County program to determine the feasibility of expanding the program to include recycling other automotive parts
- Review of the possibility of providing curb-side pick-up of nonhazardous materials
- Inventory of used oil recycling facilities and implementation of a regular inspection program to prevent storm water pollution.

Household Hazardous Waste Program

The used oil public education program will provide information to the public and private sectors and will be coordinated with the household hazardous waste program. It will include education on:

- Illicit discharge connections ordinance
- Negative impacts of dumping used oil into storm sewers
- Stenciling of catch basins
- Misconception that dumping in sanitary sewer is an alternative to the storm sewer
- Education of operators of recycling facilities the proper handling procedures of materials
- Economic incentives for private companies to encourage participation in used oil program.

The development of this program will begin immediately but will not be implemented until the third year. The estimated cost is \$30,000 per year.

Charlotte, in conjunction with Mecklenburg County, will develop a permanent household hazardous waste turn-in program. The proposed methods of disposing of the wastes will include:

- Modular Structures (Bare Bones): This is a continuous service program in which the public would bring their household hazardous wastes to a permanent site for temporary storage to be removed later by a licensed contractor. There is a minimum allocation for storage space.
- Modular Structures: This is the same program as above but it allows for more storage space.
- Fixed Structure: A continuous service program that will operate similarly to the modular structure except that it would be in a fixed place and allow for maximum storage.
- Independent Fixed Structure: This is the same as the fixed structure but would be located at a site different than the fixed location.
- Mobile Unit: This is a continuous service program in which the public would bring their household hazardous waste to a mobile unit that would move from one place to another.

Mecklenburg County currently has an educational program which utilizes videos and brochures. This program will be expanded by the use of utility bill inserts and media announcements. The planning of the household hazardous waste program is in progress and will be implemented in the second year. The costs for the city and county are estimated to be high.

Review of Small Quantity Generators

The purpose of the small quantity generators review is to determine what is required of the participants and how they impact storm water runoff. The data base of small quantity generators will be reviewed with HAZMAT and MCDEP to decide if any spill-related problems or contaminated site runoff have occurred in the past. As a result

of this review, these facilities may be included in Charlotte's inspection program for industrial facilities. The review program will begin immediately with an estimated cost of \$15,000.

Infiltration and Seepage Program

Sanitary Sewer Program

The object of this program is to reduce and eliminate sanitary sewer seepage into the storm sewer system. This program should also increase city/county coordination in dealing with problems related to infiltration and seepage from sanitary sewers and septic systems to storm sewers and surface waters. Charlotte currently has city codes in place that require new and replacement sanitary and onsite waste disposal systems to be built to lessen or eliminate leakage and infiltration of floodwaters into the system and discharge from the system into floodwaters. There is also a code that allows the city to fix inoperative sanitary sewer lines on private property and requires payment from the property owner.

MCDEP responds to sanitary flow issues on a complaint basis. CMUD has a cross connection program for the sanitary sewer that requires periodic inspection for leakage and overflows. The Mecklenburg County Health Department issues septic tank permits for the inspection of new and failed septic systems within Charlotte. The Health Department also requires remediation of failed septic systems, which are usually reported by citizen complaint, an MCDEP stream walker, or government inspector.

CMUD is currently developing a dynamic sanitary system model, along with a monitoring program for sanitary system flows and rainfall. Charlotte's role in the development of this program includes:

- Coordinating the preparation of ordinances to enforce the programs
- Ascertaining whether storm water detention facilities should continue to be built over sanitary sewer lines
- Ensuring that illicit disconnections from the storm sewer will not increase connections to sanitary sewer
- Implementing a source control program that will limit the dumping of materials into the sanitary sewer that are not treatable
- Developing public education and awareness programs.

The review and coordination of the infiltration and cross connection program with CMUD will begin immediately with an estimated cost of \$15,000.

Septic Tank Program

Charlotte, in conjunction with the Mecklenburg County Health Department, will review and revise the current septic tank program. The weaknesses they will address include:

- Notification/inspection procedure
- Lack of contractor supervision
- Abandoned septic tanks not required to be sealed
- Allowable construction of septic tanks in sensitive areas.

The septic tank program will also include a public education component and a data base of septic tank failures. The review and revisions will begin immediately with an estimated cost of \$15,000.

SEATTLE, WASHINGTON

The city of Seattle realizes the negative impacts of illicit discharges and currently operates a program that detects and eliminates such discharges. Public education and awareness is an important component of this program, but emphasis is also placed on enforcement.

Ordinances

Seattle's key ordinance to prevent illicit discharges is the Storm Water, Grading and Drainage Code. Other ordinances, with pollution prevention components, include the Side Sewer Ordinance, the Street Use Ordinance, and the Solid Waste Ordinance. The Storm Water, Grading and Drainage Code prohibits certain discharges into the storm drainage system, requires existing dischargers and land users to implement pollution prevention practices to minimize the pollutants entering storm water discharges, requires the city to review programs for drainage control and grading activity, regulates sediment and erosion controls for construction sites, designates responsibility for maintenance of drainage control facilities and erosion practices, and establishes enforcement procedures. The Storm Water, Grading and Drainage Control Code is enforced by the Department of Construction and Land Use (DCLU), the Department of Engineering - Street Use Section, and the Department of Engineering Drainage and Wastewater Utility (DWU).

Metro's Key Manhole Monitoring Program

The Municipality of Metropolitan Seattle (Metro) uses a manhole monitoring program to ascertain whether or not illicit discharge connections are present and, if so, to identify the sources. After the sources are identified, companies are brought into compliance with Metro's discharge limits and pretreatment standards. This program also requires inspections of facilities that violate the permit requirements.

Field Screening

Seattle DWU's field screening program consists of responding to citizen complaints, responding to city employees or other agency calls, and implementing source control programs and long-term monitoring of surface waters. Seattle will rely on its ordinances, the erosion control program, citizen response, and field personnel to control future illicit discharge connections problems.

Follow-up Investigation Program

The objectives of Seattle's Source Control Program are to eliminate cross connections, reduce spill-related risks, promote better waste disposal, promote good housekeeping practices, provide educational materials on water quality, and require routine maintenance of storm water control facilities where new storm drains will be constructed to reduce combined sewer overflows. This program is implemented on a watershed basis and responds to the unique characteristics of that watershed. The Source Control Program is first implemented in watersheds identified by the Department of Ecology as having surface waters of concern. These are areas of concern because they are used for recreation or as a fisheries resource. The Source Control Program contains the following steps:

- **Data Gathering:** All the water and sediment quality data from the storm drainage system and all the basin information (e.g., size, topography, industry type) are compiled. Drainage maps and side sewer cards identify outfalls and sewer lines.
- **Initial Investigation:** Drainage basins are field checked. The side sewer cards are examined, industrial sites are inspected, historical information from the owner is obtained, dye testing is performed to prove connections, and a television inspection is done when necessary. Seattle's storm drain lines and catch basin maintenance schedule is evaluated and when necessary revised to improve water quality.
- **Business Inspection and Education Program:** Businesses with a high potential to pollute storm water discharges are visited by Source Control Water Quality Investigators. During the visit, the operator will receive a copy of the written inspection procedures. If necessary, follow-up visits are conducted to guarantee compliance. The operators are encouraged to implement new BMPs or improve old ones to ensure compliance. The facilities are also given information on current programs, including enforcement information. Repeat offenders are referred to the appropriate agency for enforcement action.
- **Education and Outreach:** Educational materials describing the negative impacts illicit discharges have on the storm sewers and surface waters are distributed within watersheds to the public and to industrial facilities. An incentive program is provided for businesses to encourage participation.

The Source Control Program approach by watershed allows for onsite visits and for pipes to be checked for illicit discharge connections and has been very effective. Seattle also works with Metro's Industrial Waste Staff because of their authority to enforce pretreatment limits on discharges from industries.

Spill Prevention Program

As required by the Source Control Program, site inspections are performed at industries identified as significant polluters. The inspectors ensure that each facility has a spill prevention program, including the materials to respond to a spill. The Seattle Municipal Code requires all industrial facilities to develop and implement spill prevention programs.

Seattle Fire Department - Hazardous Materials Unit

Within Seattle, the Fire Department is the main responder to spills within the city, as well as those to surface waters. The Fire Department enforces sections of the Uniform Building Code that address buildings used for storing, handling, or using hazardous wastes. Each industry that uses or stores certain amounts of hazardous wastes is required to obtain a permit from the Fire Department. Facilities are inspected when they apply for the permit and are inspected each year after permit issuance.

Seattle Police Department - Harbor Patrol Unit

The Seattle Harbor Patrol is responsible for the enforcement of oil spill regulations within the Seattle Harbor Code. The patrol investigates complaints received from a 24-hour hotline and reports from the Department of Ecology and the U.S. Coast Guard. If a pollution problem exists, the source is traced and enforcement actions taken.

Trouble Call Network

Metro runs a Trouble Call Network for public use for handling potential water quality problems, including spills. Seattle works with Metro on this project.

Public Reporting Program

DWU published literature with telephone numbers for citizen use when reporting water quality problems or for requesting information on disposal of hazardous materials.

DWU recognizes the importance of public education in relation to protecting water quality and has taken an approach that combines the following three components: public involvement, in-school education, and general public outreach.

Public Involvement

Citizen involvement was important in developing Seattle's storm water program, and DWU involves citizens at various levels of the decision making process. The public involvement programs include the following:

- Comprehensive Drainage Program Citizens Advisory Committee: Citizens were key in developing the DWU. The DWU is charged with developing a Comprehensive Drainage Program to determine which areas would benefit the most from the new fees. A Citizens Advisory Committee (CAC) was created to represent the community interests. The Comprehensive Drainage Program is the foundation of Seattle's water quality projects and will be updated in 5 years with public involvement.
- Drainage and Wastewater Utility Citizens Advisory Committee: The CAC is now the advisory committee for the ongoing activity of the DWU. The Drainage and Wastewater-Utility Citizens Advisory Committee (DWUCAC) has expanded its membership to include minority communities and industrial interests that are concerned about water quality and utility services.
- Capital Project Development: When programs for new capital facilities are developed, DWU involves the public. The public interest usually focuses on the impacts of construction but may expand to include water quality and environmental improvement.
- Watershed Planning: The Puget Sound Water Quality Authority and the Department of Ecology administer a program that addresses planning for the control of nonpoint source pollution within watersheds. The watershed programs are developed by a Watershed Management Committee (WMC),

which comprises members from community and business organizations and government agencies that are interested in the watershed.

Schools Education Programs

These educational programs emphasize respect for water resources and encourage responsible behavior. DWU's schools program builds on existing environmental education and has reached 80 Seattle schools. The following list describes several of these programs:

- **Salmon in the Classroom:** DWU has provided the training and equipment for teachers in schools to raise salmon from egg to fry and then release the fry into local receiving waters. The salmon are raised in aquariums that simulate spawning stream conditions. DWU trains the teachers participating in the project and provides a manual for additional training and lesson planning. DWU also sponsors two field trips: one to obtain the eggs and the other to release the fry.
- **Seattle Aquarium Field Trip:** DWU sponsors a field trip every year for fourth or fifth grade students to the Seattle Aquarium to learn about aquatic species, their habitat, and the impacts of human activity on their habitat. DWU also sponsors a fishing field-trip to a trout farm. Students receive a tour and learn about the impacts of nonpoint source pollution.
- **Middle School Water Quality Education Video Program:** "Water You Doing?" is a 35-minute educational video produced by DWU with a grant from the Department of Ecology. The video's audience is middle school students and includes a teacher's manual and field trip guide. Five video segments address five different water quality issues. The manual describes lesson planning, is a resource guide, and contains a field trip directory. DWU has given workshops on how to use the video and has distributed it to every public middle school in Seattle.
- **Speakers Bureau:** DWU employees who work on water quality issues, community volunteers, and others are part of DWU's speakers bureau. The speakers give classroom presentations on water quality education activities sponsored by the DWU.
- **Puget Sound on Wheels:** DWU is sponsoring the development of a mobile educational display by the Seattle Aquarium. The display will include a truck outfitted with a walk-through exhibit describing the Puget Sound water resource, habitat, and pollution issues. The exhibit will be shown at schools and community fairs.
- **Education Coordination:** Other educational efforts sponsored by DWU include a teachers advisory committee that evaluates the water quality classroom and field trip activities to help DWU enhance its programs; DWU participation on Seattle's Environmental Education Committee and promotion of its programs, as well as work with other organizations; and membership in the Washington Environmental Education Committee sponsored by the State Superintendent for Public Instruction.

General Public Education Program

Many residents have an out-of-sight, out-of-mind attitude about their behaviors concerning water quality. General public education should change the negative everyday activities people perform on a regular basis. The following DWU programs encourage appropriate behavior and community initiative to protect water quality:

- Source Control Education: With a grant from the Department of Ecology, DWU has implemented a program to control nonpoint source pollution at the source. DWU accomplishes this through a three-pronged approach: Consumer Education, Clean Water Business Partners, and Targeted Education Campaigns.
- Watershed Education: DWU currently sponsors two watershed action programs in Seattle. The WMC responsible for developing the programs concluded that the people living and working within the watersheds must be educated on water quality in order to prevent further degradation of the watersheds.
- Storm Drain Stenciling: DWU uses volunteer school and community groups to paint a message on Seattle's storm drain inlets. With this program, DWU hopes to rid Seattle of the out-of-sight, out-of-mind attitude.
- Motor Oil Recycling: DWU and the Seattle Solid Waste Utility coordinate a used oil recycling program. Waste oil collection tanks are located at the 12 locations of an auto supply store in Seattle. The supply store, along with the utilities, publicizes the program.
- Waterfront Awareness Company: DWU and an association of waterfront businesses have initiated a cleanup campaign for the waterfront. DWU has also added a pollution prevention message to the effort and has recruited children to paint pollution prevention messages on trash cans.
- Seattle Aquarium Intertidal Exhibit: DWU has contributed to a new aquarium exhibit displaying an intertidal ecosystem and explaining the potential negative impacts of human activity on the ecosystem.
- Bill Inserts and Citywide Direct Mailings: DWU includes education and public awareness materials in its bimonthly billings. Customers are also mailed brochures about water quality protection and storm water management.
- Outreach to Non-English Speaking Communities: DWU is developing water quality messages in different languages for publication in community newspapers.
- Television Public Service Announcements: DWU has developed four public service announcements for broadcast on local television. The announcements address the importance of watersheds, the difference between sanitary and storm sewers, nonpoint source pollution, and pet waste.
- Seattle Public Libraries: DWU is currently working to distribute copies of the educational videos to all branches of the public library. The video has also been made available for broadcast on the public access cable station. DWU will develop educational displays for all of the libraries.

Local Hazardous Waste Management Program for Seattle-King County

Seattle is part of the local hazardous waste management program and is currently developing and implementing programs for small businesses. The components of the program are to provide free onsite consultations to small businesses; organize seminars, workshops, and classes for business persons; create brochures, booklets, and other materials; create a resource library on hazardous waste issues; provide response to complaint calls and agency referrals; conduct onsite surveys of business practices; and research new treatment methods. Participating agencies include the Seattle-King County Health Department, King County, Seattle, Metro, and 29 suburban cities.

Solid Waste Utility Household Hazardous Waste Program

The Seattle Solid Waste Utility operates one permanent household hazardous waste collection site and sponsors a used motor oil collection system. The household hazardous waste component also provides educational materials to the public on alternative products, collection services, and the proper use and disposal of products.

Metro's Small Quantity Generator Program

This program provides small businesses with information and assistance on the proper use and disposal of hazardous wastes and on ways to minimize the pollutants entering storm drains and surface waters. The Waste Information Network was developed through this program and consists of private businesses, public agencies, and other groups that try to resolve waste management concerns.

Seattle-King County Department of Public Health Environmental Services Program

The health department operates a telephone information line that provides information on waste reduction and the proper storage and disposal of household hazardous wastes. The health department also operates a materials exchange, known as "Industrial Materials Exchange" (IMEX). IMEX oversees the transfer of hazardous materials from the generator to a party that can use them.

Infiltration Control Program

If infiltration from the sanitary sewer to the storm sewer occurs, the city's maintenance crew will conduct a television or walk-through inspection to locate the leak and make the necessary repairs. Storm drain maintenance activities include upgrading surface drainage facilities (e.g., inlets, catch basins, junction boxes, ditches) and removing debris from detention facilities. Sewer maintenance includes inspection, routine cleaning, and system repairs.

VIRGINIA BEACH, VIRGINIA

Virginia Beach presently facilitates or participates in existing programs that address illicit discharges and other forms of pollution. The illicit discharge program described below will supplement the current programs for detecting and eliminating sources of illicit discharges.

Ordinances

The city of Virginia Beach has developed the Storm Sewer Discharge Ordinance, which authorizes the city to regulate non-storm water discharges to storm sewers and surface waters. This ordinance will supplement other codes currently in effect, specifically the building code, which requires sanitary and storm sewers of a building to be kept separate. The Department of Public Works will be responsible for implementing and enforcing the ordinance. The Storm Sewer Discharge Ordinance also grants inspection and monitoring authority, as necessary, for administration and enforcement to the Department of Public Works. An existing program conducted by Public Works through the Department of Permits and Inspections inspects construction sites for illicit discharges. Other city agencies that perform inspections are to report violations to the Department of Public Works.

Ongoing Field Screening Program

The purpose of this program is to test field screening points throughout the term of the permit for dry weather flows and other indications of possible illicit discharges. The program will screen points identified in the city's Part 1 application and screen new points.

Part 1 Sites

Out of the 112 field screening points with dry weather flow identified in Part 1, 30 sites were chosen for continued dry weather monitoring. The sampling results are compiled and added to the existing GIS data base. If dry weather flow continues at these sites, the possible source(s) will be investigated.

New Sites

New field screening sites will be chosen from areas with high concentrations of commercial, industrial, and older residential areas and from major highways and roads that have automotive and commercial service areas. The final selection of the new screening points will be determined by field inspection. The chosen outfalls are examined for dry weather flow. If flow is present, then a sample is taken. Twenty-five new field screening points will be evaluated during each year of the permit. The sampling data for each site will be compiled and entered into the GIS data base. If dry weather flow continues at these sites, the possible source(s) will be investigated.

Investigation of the Storm Sewer System

To locate the sources of illicit discharges, sections of the storm sewer will have to be investigated. Investigations will be conducted based on analysis of the data received from field screening activities and any other information the city receives concerning illicit discharge connections. This program will emphasize public reporting to aid investigations. Investigations will occur at the problem areas and will involve mapping and evaluation, field surveys, and source identification.

Mapping and Evaluation

Each area to be investigated will be highlighted on the storm sewer map, and the drainage area will be defined. The types of land uses will also be evaluated to determine the types of residential, commercial, and industrial areas that may be potential polluters. Other areas that will receive special attention include sanitary, septic tanks, and vehicle maintenance activity sources.

Field Surveys

The city will utilize the strategy of "halving-intervals" to locate the area of the source. This method will be applied to the main trunk of the sewer system and branch lines as necessary. Investigations will occur halfway between the field screening points and the upper most headwater locations. These investigations will use the same criteria as the field screening, except only one site visit will be conducted. The Department of Public Works will perform the field surveys.

Source Identification

After the area and the probable activity have been identified, field visits will be conducted to identify the source(s). Five actions are taken to eliminate a source once it is identified: sending a letter with a questionnaire; site visit and interview; dye tests or smoke tests, if needed; noncompliance notification; and follow-up inspections.

- **Letter with Questionnaire:** The Department of Public Works will send a letter to the owner/operator of the suspected source to advise the owner/operator of the problem and to request that the owner/operator complete the attached questionnaire. The completed questionnaire should describe the industrial activities and indicate the possible sources of non-storm water discharges.
- **Site Visit and Interview:** After the questionnaire is received, a staff person from the Department of Public Works will conduct a site visit and interview to further pinpoint the source.
- **Dye Tests and Smoke Tests:** If the questionnaire, site visit, and interview do not support the field screening data, then it is necessary to perform fluorometric dye tests of plumbing fixtures and floor drains. If several sources are suspected, a smoke test may be needed to limit the number of possible sources and to allow for a more detailed analysis. These tests will be performed by the Department of Public Works.
- **Notification of Noncompliance:** Once the suspected source is confirmed, the owner/operator will be issued a notification of noncompliance with the Storm Sewer Discharge Ordinance and will be subject to the penalties in the ordinance.

- **Follow-up Inspection** The Public Works staff will conduct follow-up inspections to ensure that corrective action was taken and the illicit discharge has been eliminated. If the negligent violation continues, the Virginia Water Control Board (VWCB) and/or the news media will be notified.

Spills Program

The spills program in Virginia Beach has two components: hazardous material spill response and inspection of sites for proper compliance with State and Federal regulations for gas, oil, and hazardous chemicals.

Spill Response Program

The city will continue to implement its Hazardous Materials Emergency Response Program through the Virginia Beach Fire Department. The program is structured to comply with SARA Title III, Emergency Planning and Community Right-to-Know legislation. The response program details the proper procedures to be followed in the event of a hazardous materials spill, which could affect persons, property, or the environment. The program also describes the roles and responsibilities of local government and private agencies when responding to hazardous materials emergencies.

The Fire Department is responsible for the command and control of activities during a spill event. The Fire Department provides initial containment, fire suppression, rescue operations, and evacuation procedures. However, cleanup is the responsibility of the spiller, or owner/operator of the facility, with monitoring from the Fire Department. When necessary, the Fire Department contacts local, State, and Federal government offices. The Department of Public Works will be notified if any spills enter or have the potential to enter the storm sewer or surface waters. Public Works will then assist the Fire Department with material and equipment to prevent the spill from entering the storm sewer and/or to remove an existing spill from within the storm sewer.

Inspection Program

The VWCB is responsible for regulating waste materials for wastewater and petroleum products, and the Virginia Department of Waste Management regulates solid and hazardous wastes. Under the Hazardous Waste Management Regulations, the Virginia Department of Waste Management requires facilities that generate more than 1,000 kilograms per month of hazardous waste to develop a contingency program and emergency procedures. The Federal Government requires a spill prevention and containment countermeasures (SPCC) program for facilities that have the potential to discharge oil in reportable quantities to surface waters. VWCB requires facilities covered under an SPCC to develop an oil discharge contingency program for bulk storage of 25,000 gallons or more.

- The city has an inspection program that delineates the proper methods for the storage and handling of hazardous wastes to prevent spills from entering the storm sewer or surface waters. The Fire Marshal's office inspects all commercial properties for compliance. Inspection frequency is based on the nature of the perceived hazard. New buildings and construction sites are inspected by the Permits and Inspections Division of the Department of Public Works to ensure compliance with State and Federal regulations for gas, oil, and hazardous chemicals.

Reporting of Illicit Discharges and Water Quality Impacts

Virginia Beach has implemented various programs to address water quality issues. Public education programs in relation to storm water are coordinated through the Public Information Office at Public Works. The city's local cable television channel has shown videos on water quality, litter control, sediment and erosion control, and storm water management. The city has also distributed literature in the form of leaflets and brochures on similar topics. On a regional level, storm water public information programs are developed through the Hampton Roads Municipal Communicators (HRMC). HRMC's membership includes the cities/counties of Virginia Beach, Norfolk, Hampton, Chesapeake, James City, Newport News, Portsmouth, Suffolk, and York. Upcoming projects include stenciling storm drains and developing public service announcements for media broadcast.

Awareness and Reporting

The current programs increase public awareness of water quality issues and of potential impacts of illicit discharges. The city would like the public to increase reporting of illicit discharges. The Department of Planning within the Division of Environmental Management, along with other departments, takes reports of odor, color, turbidity, and the presence of trash in storm sewers and waterways. The following information programs will continue to increase public awareness and encourage the public to report signs of illicit discharges. These information programs include a brochure, Cityline message, and a slide show:

- **Brochure**: The brochure will address "what to look for" and "who to report to." The public will receive discharges. The brochure will present the options of a hotline and a mailing address for reporting. The Public Information Office will develop and distribute the brochure with funding from Public Works. The brochure will be mailed with the water/sewer bill every 2 years and be distributed to schools and community groups.
- **Cityline Message**: Virginia Beach has a public information service line called Cityline. A taped message concerning illicit discharges will be developed for Cityline and will include information similar to that in the brochure.
- **Slide Show**: A slide show with accompanying text will be developed by the Public Information Office. The target audience will be children and community groups. The slide show will be presented once a year at elementary, middle, and high schools. A copy of the slide show will also be given to the Virginia Marine Science Museum.

Proper Management and Disposal of Used Oil and Toxic Materials

The City currently participates in programs that facilitate the proper disposal of used oil and toxic materials. The Southeastern Public Service Authority (SPSA) has various recycling programs, including curbside collection and drop-off centers. SPSA produces and distributes brochures explaining the recycling program and listing the locations of the drop-off centers. Household hazardous wastes are accepted at the regional landfill and at seven transfer stations free of charge to private citizens. The State of Virginia operates a used oil recycling program through the Department of Mines, Minerals and Energy. This program recruits service stations to accept and properly dispose of used oil. A toll free number that gives the names and locations of the service stations is available to the public.

New Programs

The following new programs will be developed:

- **Brochure:** The Public Information Office will develop and distribute a brochure to promote and explain all programs within the city that handle the proper management activities of used oil and toxic materials. The brochure will list the telephone numbers of the various agencies with such programs. The brochure will be available at slide show presentations and mailed every 2 years with the water/sewer bill separate from the illicit discharges brochure.
- **Cityline Message:** A hyped message will be developed by the Public Information Office that will state the major programs and information sources that deal with the management and disposal of used oil and toxic materials.
- **Slide Show:** A slide show will be developed on the proper management and disposal of used oil and toxic materials. The slide show will be made available to schools, community groups, and the Virginia Marine Science Museum.

Controls to Limit Infiltration from Sanitary Sewers and Septic Systems

Sanitary Sewers

Problems with infiltration of seepage from sanitary sewers to storms sewers in Virginia Beach are rare because the storm sewer is located under the curb and the sanitary sewer is in the middle of the road. The Sewer and Water Standard Specifications and Details of the Department of Public Utilities requires consideration of design, pipe depth, and alignment to avoid conflict between the two sewer systems and to facilitate maintenance. When a leak or spill does occur from the sanitary sewer to the storm sewer, the sewage is contained in the storm sewer and pumped to the sanitary sewer or tanker trucks to prevent discharge to surface waters. If the sewage cannot be collected, Public Utilities will disinfect the site and obtain a special discharge permit from VWCB. Sanitary overflows are reported to VWCB's Tidewater Regional Office within 24 hours. A written report is also required within 5 days. Public Utilities reports any overflows to Public Works.

The Department of Public Utilities has an inspection program for locating defects within the sanitary sewer system. Television inspections for infiltration problems are performed on 80,000 feet of sewer lines per year.

Septic Systems

Subdivision regulations require every subdivision to have an adequate sanitary sewerage system cohesive with the type of development proposed. If public sewerage is not an option, then private septic tanks must be built. These individual sewerage systems must be permitted by the Virginia Beach Health District in cooperation with the Virginia State Health Department.

If the public health director determines that the area chosen for the septic system has poorly drained soils, then a land management program must be developed by the property owner and approved by the director. The program must contain the location of the septic tanks and a proposed drainage program. The owner is also responsible for the construction, repair, maintenance, and operation of the system.

If septic tanks are located in the Chesapeake Bay Preservation Area, the Chesapeake Bay Preservation Area Ordinance requires the property owner to provide a reserve sewage disposal drainfield site with a capacity at least equal to the primary sewage disposal drainfield site. The same is true for septic systems located in the Southern Watersheds, as stipulated in the Southern Watersheds Management Ordinance.

REFERENCES

- American Public Health Association, American Water Works Association, and Water Environment Federation. 1992. *Standard Methods for the Examination of Water and Wastewater*.
- City of Charlotte, North Carolina. 1992. *Part II NPDES Permit Application for Discharges From MS4s*.
- City of Seattle, Washington. 1992. *Part II NPDES Permit Application for Discharges From MS4s*.
- City of Virginia Beach, Virginia. 1992. *Part II NPDES Permit Application for Discharges From MS4s*.
- The City of Fort Worth Texas. 1989. *Operational Guide, City of Fort Worth Drainage Water Pollution Control Program* Department of Public Health.
- U.S. EPA, Office of Research and Development. 1993. *Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems - A User's Guide*.
- U.S. EPA, Office of Water. 1992. *Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from MS4s*.

ATTACHMENT 50



Ventura Countywide Stormwater Quality Management Program

May 7, 2010

(VIA EMAIL)

Participating Agencies

Ms. Tracy Egoscue
Executive Officer
California Regional Water Quality Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Camarillo

County of Ventura

Fillmore

Subject: VENTURA COUNTYWIDE MS4 PERMIT, BOARD ORDER NO: 09-0057 NPDES PERMIT NO CAS004002; SUBMITTAL OF ANNUAL REPORT ELECTRONIC REPORTING FORMAT

Moorpark

Dear Ms. Egoscue:

Ojai

Please find the attached files of an Electronic Reporting Format for the annual report pursuant to the requirements of the Ventura County Municipal Stormwater Permit (Permit), Order No. R4-2009-0057, Part 4, Section I.

Oxnard

The Ventura Countywide Stormwater Quality Program (Program) worked with Regional Water Board staff to develop an acceptable reporting format to meet Permit requirements. The attached electronic forms are designed to work with a web based interface. The information requested will show compliance with the Permit. However, the Program also plans to use the reporting process to improve program management through effectiveness assessment. To that end the forms call for much more information than the permit requires.

Port Hueneme

San Buenaventura

Santa Paula

We strongly request that you do not adopt these forms and the information they request as permit requirements. We also are requesting the Program be granted the additional time stated in the Tentative Draft released May 6, 2010 for the opportunity to continue to develop an electronic reporting format.

Simi Valley

We appreciate your consideration of these requests. If you have any questions feel free to contact me at (805) 654-5051.

Thousand Oaks

Respectfully,

Ventura County
Watershed Protection
District

Gerhardt Hubner, Chair
Ventura Countywide Stormwater Quality Program

Electronic Attachments: sent via email
C via email : Renee Purdee – LARWQCB
Ventura Countywide Stormwater Program Management Committee



ATTACHMENT 51



California Regional Water Quality Control Board

Los Angeles Region



Linda S. Adams
Cal/EPA Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.waterboards.ca.gov/losangeles>

Arnold Schwarzenegger
Governor

November 29, 2010,

Ms. Norma Camacho, Director
Ventura County Watershed Protection District
800 South Victoria Ave., L#1600
Ventura, CA 93009-1600

**APPROVAL OF REVISED ANNUAL REPORTING FORMAT FOR REPORTING PROGRAM –
No. CI 7388 FOR REGIONAL BOARD ORDER NO. R4-2010-0108 (NPDES PERMIT NO.
CAS004002) WASTE DISCHARGE REQUIREMENTS FOR MUNICIPAL SEPARATE STORM
SEWER SYSTEMS DISCHARGES WITHIN THE VENTURA COUNTY WATERSHED
PROTECTION DISTRICT, COUNTY OF VENTURA AND THE INCORPORATED CITIES
THEREIN**

Ms. Camacho:

Regional Board staff have completed reviewing the alternative annual reporting form submitted as an alternative to the one developed by staff. Staff finds that the reporting form submitted by the County of Ventura addresses all the substantive elements contained in the staff developed annual reporting form as well as containing an assessment of each program element that was not part of the staff annual report.

Therefore, this letter serves as notification to the County of Ventura that we are approving the substitution of the County of Ventura annual reporting form for the format developed by Regional Board staff.

The Principal Permittee shall submit by December 15th of each year beginning December 15, 2010, an Annual Report to the Regional Water Board Executive Officer in the form of a one hard copy and three compact disks (CD) (or equivalent electronic format).

If you should have any questions regarding this letter please feel free to call me at (213) 576-6605 or your staff may contact Ivar Ridgeway at (213) 620-2150.

Sincerely,

Samuel Unger, P.E.
Executive Officer

cc: Ventura County MS4 Co-permittees

California Environmental Protection Agency



Recycled Paper

Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

ATTACHMENT 52

Ventura County Technical Guidance Manual for Stormwater Quality Control Measures

Manual Update 2011



Ventura Countywide
Stormwater Quality
Management Program



Prepared by

Larry Walker Associates
707 Fourth Street, Suite 200
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Geosyntec Consultants
1111 Broadway, 6th Floor
Oakland, CA 94607

July 13, 2011

Manual Updates: The 2011 TGM may be periodically updated to correct minor errors and unintentional omissions. Additionally, due to the evolving nature of stormwater quality management, the 2011 TGM may also be updated to incorporate new and innovative control measures. 2011 TGM users should ensure that they are referencing the most current edition by checking www.vcstormwater.org or contacting the local permitting agency.

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1 INTRODUCTION

This *Technical Guidance Manual for Stormwater Quality Measures* (2011 TGM) provides guidance for the implementation of stormwater management control measures in new development and redevelopment projects in the County of Ventura and the incorporated cities therein. These guidelines are intended to improve water quality and mitigate potential water quality impacts. These guidelines have been developed to meet the Planning and Land Development requirements contained in Part 4, Section E of the Los Angeles Regional Water Quality Control Board's (Regional Board) municipal separate storm sewer system (MS4) permit ([Order R4-2010-0108](#)) for new development and redevelopment projects.

The Planning and Land Development requirements are not implemented at the discretion of the local permitting agency; they are requirements in Order R4-2010-0108 that must be complied with. The 2011 TGM does not attempt to expand or circumvent these requirements, but rather it provides guidance on how to meet them.

When used in this Manual, the verb “shall” indicates a statement of required, mandatory, or specifically prohibited practice. Statements that are not mandatory, but are recommended practice in typical situations, with allowable deviations if engineering judgment or scientific study indicates them appropriate, are typically stated with the verb “should.” In both cases specific options may be provided that are allowable modifications.

1.1 Goals

The 2011 TGM has been prepared by the Ventura Countywide Stormwater Quality Management Program to accomplish the following goals:

- Ensure that new development and redevelopment projects reduce urban runoff pollution to the "maximum extent practicable" (MEP);
- Ensure that the implementation of measures in the 2011 TGM are consistent with Regional Water Quality Control Board [Order R4-2010-0108](#) and other state requirements;
- Provide guidance to developers, design engineers, agency engineers, and planners on the selection and implementation of appropriate stormwater management control measures; and
- Provide maintenance procedures to ensure that the selected stormwater management control measures will be properly maintained to provide effective, long-term pollution control.

1.2 Regulatory Background

In 1972, the Federal Water Pollution Control Act [later referred to as the Clean Water Act (CWA)] was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to waters of the United States from any point source. In 1987, the CWA was amended to require the United States Environmental Protection Agency (USEPA) to establish regulations permitting municipal and industrial stormwater discharges under the NPDES permit program. The USEPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that MS4 discharges to surface waters be regulated by a NPDES permit.

The Ventura County Watershed Protection District, County of Ventura, and the cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley, and Thousand Oaks have joined together to form the Ventura Countywide Stormwater Quality Management Program (Program) and are named as co-permittees under a revised countywide municipal NPDES permit for stormwater discharges issued by the Regional Water Quality Control Board in 2010 ([Order R4-2010-0108](#)).

Prior to the issuance of [Order R4-2010-0108](#), stormwater discharges from the Ventura County MS4 were covered under the countywide waste discharge requirements contained in three previous MS4 NPDES Permits (Order 09-0057, Order 00-108, and Order No. 94-082).

Under [Order R4-2010-0108](#), the co-permittees are required to administer, implement, and enforce a Stormwater Quality Management Program (Program) to reduce pollutants in urban runoff to the MEP. The Program emphasizes all aspects of pollution control including, but not limited to, public awareness and participation, source control, regulatory restrictions, water quality monitoring, and treatment control.

For the Program to be successful, it is critical to control urban runoff pollution from new development and redevelopment projects during and after construction. Therefore, the co-permittees implemented the Planning and Land Development Program, one element within the Program, to specifically control post-construction urban runoff pollutants from new development and redevelopment projects. The goal of the Planning and Land Development Program is to minimize runoff pollution typically caused by land development and protect the beneficial uses of receiving waters by limiting effective impervious area (EIA) to no more than 5% of the project area and retaining stormwater on site. This goal can be achieved by employing a sensible combination of Site Design Principles and Techniques, Source Control Measures, Retention Best Management Practices (BMPs), Biofiltration BMPs, and Treatment Control Measures to the level required in [Order R4-2010-0108](#).

“Site Design Principles and Techniques,” “Source Control Measures,” “Retention

BMPs,” “Biofiltration BMPs,” and “Treatment Control Measures,” as used in the 2011 TGM refer to BMPs and features incorporated into the design of a new development or redevelopment project, which prevent and/or reduce pollutants in stormwater runoff from the project. These measures are described below:

- 1) **Site Design Principles and Techniques** are a stormwater management strategy that emphasizes conservation and use of existing site features to reduce the amount of runoff and pollutant loading that is generated from a project site.
- 2) **Source Control Measures** limit the exposure of materials and activities so that potential sources of pollutants are prevented from making contact with stormwater runoff.
- 3) **Retention BMPs** are stormwater BMPs that are designed to retain water onsite, and achieve a greater reduction in surface runoff from a project site than traditional stormwater Treatment Control Measures. The term “Retention BMPs” encompasses infiltration, rainwater harvesting¹, and evapotranspiration BMPs. Retention BMPs are preferred and shall be selected over biofiltration BMPs and Treatment Control Measures where technically feasible to do so.
- 4) **Biofiltration BMPs** are vegetated stormwater BMPs that remove pollutants by filtering stormwater through vegetation and soils.
- 5) **Treatment Control Measures** are engineered BMPs that provide a reduction of pollutant loads and concentrations in stormwater runoff.

Applicable projects (Section 1.4) must reduce Effective Impervious Area (EIA) to less than or equal to five percent ($\leq 5\%$) of the total project area, unless infeasible. Impervious surfaces are rendered “ineffective” if the design storm volume is fully retained onsite using Retention BMPs. Biofiltration BMPs may be used to achieve the 5% EIA standard if Retention BMPs are technically infeasible (see [Section 3.2](#)).

The 2011 TGM contains guidance for the design and implementation of all of these types of stormwater management control measures for new development and redevelopment projects. In addition to the requirements of [Order R4-2010-0108](#), owners and developers of some of the sites in the County may also be subject to the State of California’s general permit for stormwater discharge from industrial activities ([Industrial General Permit](#)) and general permit for stormwater discharge from construction activities ([Construction General Permit](#)). The stormwater management control measures provided in the 2011 TGM may also assist the owner or developer in meeting the requirements of the State’s construction and industrial permits. The stormwater management staffs of the governing co-permittee agencies are available to provide assistance regarding all of the State stormwater permit

¹ Rainwater harvesting is a BMP that stores and uses rainwater or stormwater runoff. This is consistent with the use of the term “reuse” contained in Order R4-2010-0108.

requirements.

1.3 Impacts of Land Development

The Cities and County of Ventura have separate stormwater and sanitary sewer conveyance systems. Land development typically creates an increase in impervious surfaces, which increases the amount of runoff and pollutants entering stormwater conveyance systems. Pollutants that enter the conveyance system in stormwater are typically transported directly to receiving waters (i.e. local channels, rivers, and the ocean), and are not treated in a wastewater treatment plant. Pollutants in untreated stormwater runoff from impervious surfaces that drains to streets and enters storm drains directly contribute to water pollution.

Typically, as stormwater runs over impervious surfaces (e.g., rooftops, roadways, and parking lots), it:

- Does not infiltrate or evapotranspire, which increases runoff volumes, velocities, and flow rates;
- Moves more quickly, which increases runoff velocities; and
- Entrains (i.e., accumulates) pollution and sediment, which increases nutrients, bacteria, and other pollutant concentrations in receiving waters (i.e., local channels, rivers, and the ocean).

The impacts of these alterations due to development may include:

- Increased concentrations of nutrients, toxic pollutants, and bacteria in surface receiving waters, including adjacent land and habitat (e.g., beaches) creeks, estuaries, and storm drain outlets.
- Increased flooding due to higher peak flow rates and runoff volumes produced by a storm.
- Decreased wet season groundwater recharge due to a decreased infiltration area.
- Increased dry season groundwater recharge due to outdoor irrigation with potable or reclaimed water.
- Introduction of baseflows in ephemeral streams due to surface discharge of dry weather urban runoff.
- Increased stream and channel bank instability and erosion due to increased runoff volumes, flow durations, and higher stream velocities (“hydromodification impacts”); and

- Increased stream temperature due to loss of riparian vegetation as well as runoff warmed by impervious surfaces, which decreases dissolved oxygen levels and makes streams inhospitable to some aquatic life requiring cooler temperatures for survival.

1.4 Stormwater Management Principles

Stormwater management principles such as Integrated Water Resource Management (IWRM) and Low Impact Development (LID) can be used to help mitigate the impacts of development. These principles are described below.

The emergence of LID falls under the umbrella of the over-arching concept of IWRM. IWRM is a process which promotes the coordinated development and management of water, land, and related resources. IWRM links traditional development topics such as land use, water supply, wastewater treatment/reclamation, flood control/drainage, water quality, and hydromodification management into a cohesive hydrologic system that recognizes their interdependencies and minimizes their potentially negative effects on the environment. An example of IWRM includes recharging groundwater with reclaimed wastewater to support the water supply. Another example is combining stormwater treatment, hydromodification control, and flood control in a single regional infiltration basin that recharges groundwater, incorporates recreation, and provides habitat. Another example is using Smart Growth principles to help reduce the environmental footprint while still accommodating growth.

Generally, the 2011 TGM advises to first design for the largest hydrologic controls (such as matching post development 100-year flows with pre-project 100-year flows for flood mitigation requirements), according to the appropriate City or County drainage requirements (not included in the 2011 TGM). Secondly, the 2011 TGM advises to check if flood mitigation will reduce or satisfy the stormwater management requirements (as set forth in the 2011 TGM). If it does not, then add more controls as necessary. Flood mitigation may provide the necessary sediment and pollution control, thereby reducing maintenance requirements for the stormwater management BMPs. A sequence of hydrologic controls should be considered, such as site design, flood drainage mitigation, and Retention BMPs. Biofiltration BMPs and Treatment Control Measures can be considered where the use of Retention BMPs is technically infeasible. Each of these controls will have an influence on stormwater runoff from the new development or redevelopment project.

Similar to Source Control Measures, which prevent pollutant sources from contacting stormwater runoff, Retention BMPs use techniques to infiltrate, store, use, and evaporate runoff onsite to mimic pre-development hydrology, to the extent feasible. The goal of LID is to increase groundwater recharge, enhance water quality, and prevent degradation of downstream natural drainage channels. This goal may be accomplished with creative site planning and with incorporation of localized, naturally functioning BMPs into the project. Implementation of Retention BMPs will

reduce the size of additional Hydromodification Control Measures that may be required for a new development or redevelopment project, and, in many circumstances, may be used to satisfy all stormwater management requirements.

1.5 Applicability

The following projects and associated triggers, contained in subpart 4.E.II of [Order R4-2010-0108](#), are subject to the requirements and standards laid out in the 2011 TGM.

Note that some of the project triggers are based on *total altered surface area* and others on *impervious surface area*, which is an intentional requirement in the MS4 Permit.

New Development Projects

Development projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures, prior to completion of the project(s), are:

- 1) All development projects equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area.
- 2) Industrial parks with 10,000 square feet or more of total altered surface area.
- 3) Commercial strip malls with 10,000 square feet or more of impervious surface area.
- 4) Retail gasoline outlets with 5,000 square feet or more of total altered surface area.
- 5) Restaurants (Standard Industrial Classification (SIC) of 5812) with 5,000 square feet or more of total altered surface area.
- 6) Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces.
- 7) Streets, roads, highways, and freeway construction of 10,000 square feet or more of impervious surface area (see [Section 2](#) for specific requirements).
- 8) Automotive service facilities (Standard Industrial Classification (SIC) of 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) of 5,000 square feet or more of total altered surface area.
- 9) Projects located in or directly adjacent to, or discharging directly to an Environmentally Sensitive Area (ESA), where the development will:
 - a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and

- b. Create 2,500 square feet or more of impervious surface area.
- 10) Single-family hillside homes (see [Section 2](#) for specific requirements).

Redevelopment Projects

Redevelopment projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures, prior to completion of the project(s), are redevelopment projects in categories 1 through 10 above that meet the threshold identified below:

- Land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site.

Additionally:

- 1) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to the post development stormwater quality control requirements of Board Order 00-108, shall mitigate the entire redevelopment project area.
- 2) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to the post development stormwater quality control requirements of Board Order 00-108, must mitigate only the altered portion of the redevelopment project area and not the entire project area.
- 3) Projects where redevelopment results in an alteration of less than fifty percent of impervious surfaces of a previously existing development must mitigate only the altered portion of the redevelopment project area and not the entire project area.

Land-disturbing activity that results in the creation or addition or replacement of less than 5,000 square feet of impervious surface area on an already developed site, or that results in a decrease in impervious area which was subject to the post-development stormwater quality control requirements of Board Order 00-108, is not subject to mitigation unless so directed by the local permitting agency.

Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of the facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, that does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Redevelopment also does not include the repaving of existing roads to maintain original line and grade.

Existing single-family dwelling and accessory structure projects are exempt from the redevelopment requirements unless the project creates, adds, or replaces 10,000 square feet of impervious surface area.

Effective Date

The new development and redevelopment requirements contained in Part 4, Section E of Board [Order R4-2010-0108](#) (the “Order”) shall become effective 90 calendar days after the Regional Water Quality Control Board Executive Officer approves the 2011 TGM (the “Effective Date”). After the Effective Date, all applicable projects, except those identified below, must comply with the new development and redevelopment requirements contained in Part 4, Section E of the Order.

The new development and redevelopment requirements contained in Part 4, Section E of the Order shall not apply to the projects described in paragraphs 1 through 5 below. Projects meeting the criteria listed in paragraphs 1 through 5 below shall instead continue to comply with the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures under Board Order 00-108:

- 1) Projects or phases of projects where the project’s applications have been “deemed complete for processing” (or words of equivalent meaning), including projects with ministerial approval, by the applicable local permitting agency in accordance with the local permitting agency’s applicable rules prior to the Effective Date; or
- 2) Projects that are the subject of an approved Development Agreement and/or an adopted Specific Plan; or an application for a Development Agreement and/or Specific Plan where the application for the Development Agreement and/or Specific Plan has been “deemed complete for processing” (or words of equivalent meaning), by the applicable local permitting agency in accordance with the local permitting agency’s applicable rules, and thereafter during the term of such Development Agreement and/or Specific Plan unless earlier cancelled or terminated; or
- 3) All private projects in which, prior to the Effective Date, the private party has completed public improvements; commenced design, obtained financing, and/or participated in the financing of the public improvements; or which requires the private party to reimburse the local agency for public improvements upon the development of such private project; or
- 4) Local agency projects for which the governing body or their designee has approved initiation of the project design prior to the Effective Date; or
- 5) A Tentative Map or Vesting Tentative Map deemed complete or approved by the local permitting agency prior to the Effective Date, and subsequently a Revised Map is submitted, the project would be exempt from the 2011 TGM provisions if the revisions substantially conform to original map design, consistent with

Subdivision Map Act requirements. Changes must also comply with local and state law.

The intent of these guidelines is to ensure that projects for which the applications have been deemed “complete” or the applicants have worked with local permitting agency staff to develop a final, or substantially final, drainage concept and site layout that includes water quality treatment based upon the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures prior to the Effective Date, are not required to redesign their proposed projects for purposes of complying with the new development and redevelopment requirements contained in Part 4, Section E of Board [Order R4-2010-0108](#).

In addition, any project, phase of a project, or individual lot within a larger previously-approved project, where the application for such project has been “deemed complete for processing” (or words of equivalent meaning) that does not have a final or substantially final drainage concept as determined by the local permitting agency or a site layout that includes water quality treatment must comply with the performance standards set forth in the 2011 TGM.

1.6 Organization of the 2011 TGM

The 2011 TGM is divided into seven sections and nine appendices:

[Section 1](#) Introduction

[Section 2](#) Stormwater Management Standards

[Section 3](#) Site Assessment and BMP Selection

[Section 4](#) Site Design Principles & Techniques

[Section 5](#) Source Control Measures

[Section 6](#) Retention BMPs, Biofiltration BMPs, and Treatment Control Measure Design

[Section 7](#) Operation and Maintenance Planning

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Appendix H Stormwater Control Measure Access and Maintenance
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2 STORMWATER MANAGEMENT STANDARDS

2.1 Introduction

This section outlines the design process to comply with stormwater control requirements. A flowchart is presented in Figure 2-1 to illustrate a step-by-step process for incorporating these stormwater management control measures.

The selection of appropriate stormwater management control measures should be a collaborative effort between the project proponent and the local permitting agency staff. It is recommended that discussions between project planners, engineers, and local permitting agency staff regarding selection of stormwater management control measures occur very early in the design process.

2.2 Step 1: Determine Project Applicability

New development and redevelopment projects meeting the applicability criteria contained in Section 4.E.II of [Order R4-2010-0108](#) [presented in [Section 1.5](#) of the 2011 TGM] must include control measures specified in the 2011 TGM. These projects should be designed to meet the performance criteria described in the steps below.

Separate requirements exist for three types of projects:

- Projects located within a Redevelopment Project Area Master Plan (RPAMP);
- Single Family Hillside Homes; and
- Roadway Projects.

The requirements for these three project types are described in further detail in the substeps below. Projects that are not applicable are still subject to stormwater agency review, especially for flood drainage requirements. Stormwater management control measures may be required by the governing agency for inapplicable projects, depending on the potential discharge of pollutants in stormwater runoff, impairments in receiving water, or other special conditions that would require increased protection.

Step 1a: Determine RPAMP Eligibility

If a project is located within the boundary of a Redevelopment Project Area Master Plan (RPAMP), the stormwater management requirements in the RPAMP take precedence over the control measures and performance criteria specified in this 2011 TGM. A stormwater agency may apply to the Regional Water Quality Control Board for approval of a RPAMP in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements.

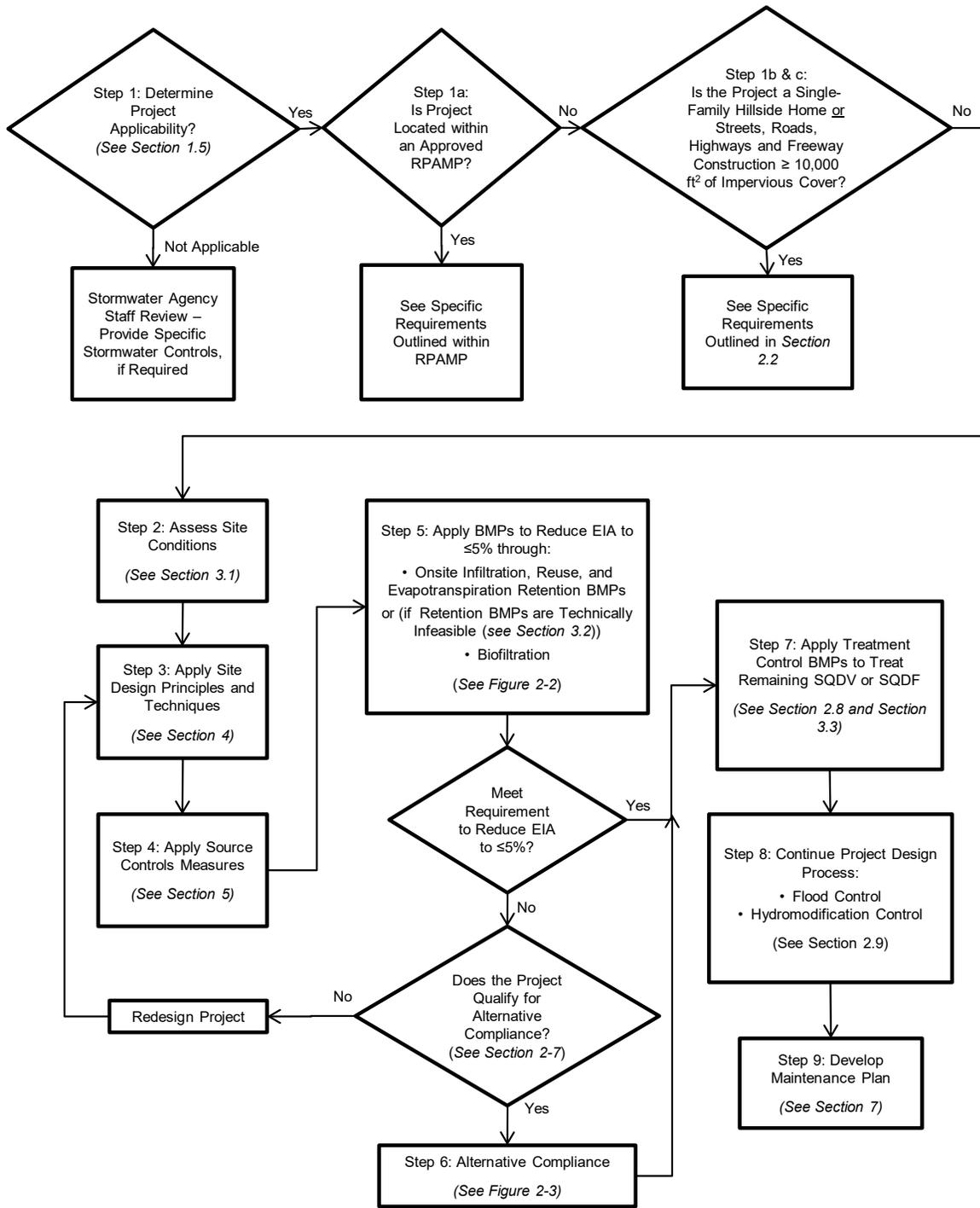


Figure 2-1: Stormwater Management Control Measures Design Decision Flowchart

Step 1b: Single-Family Hillside Homes

Single-family hillside home projects have specific requirements separate from other new development and redevelopment project categories. These requirements only apply to single-family hillside homes that disturb less than 1 acre and that add less than 10,000 square feet of impervious surface area. If the project is equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area, then project must comply with Steps 2 through 9.

According to [Order R4-2010-0108](#), a hillside is defined as:

“Property located in an area with known erosive soil conditions, where the development will result in grading on any slope that is 20% or greater or an area designated by the Municipality under a General Plan or ordinance as a ‘hillside area.’”

The measures presented in this substep comprise the performance standard for single-family hillside home new development and redevelopment projects and apply to the entire lot (additional information on these measures may be found in [Section 4](#) and [Section 5](#)).

Conserve Natural Areas

Each project site possesses unique topographic, hydrologic and vegetative features, some of which are more suitable for development than others. Locating development on the least sensitive portion of a site and conserving naturally vegetated areas can minimize environmental impacts in general and stormwater runoff impacts in particular.

The following measures are required and should be included in the lot layout, consistent with applicable General Plan and Local Area Plan policies and if appropriate and feasible with the given site conditions:

- 1) Concentrate or cluster improvements on the least-sensitive portions of the lot and leave the remaining land in a natural undisturbed state; at a minimum, sensitive portions of the lot should include areas covered under Clean Water Act Section 404 such as riparian areas and wetlands;
- 2) Limit clearing and grading of native vegetation on the lot to the minimum area needed to build the home, allow access, and provide fire protection; and
- 3) Maximize trees and other vegetation at the site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought-tolerant plants.

Protect Slopes and Channels

Erosion of slopes and channels can be a major source of sediment and associated pollutants such as nutrients, if not properly protected and stabilized.

Slope Protection

Slope protection practices must conform to local permitting agency erosion and sediment control standards and design requirements. The post-construction design criteria described below are intended to enhance and be consistent with these local standards.

- 1) Slopes must be protected from erosion by safely conveying runoff from the tops of slopes.
- 2) Slopes must be vegetated by first considering the use of native or drought-tolerant species.

Channel Protection

The following measures should be implemented to provide erosion protection to unlined receiving streams on the lot. Activities and structures must conform to applicable permitting requirements, standards, and specifications of agencies with jurisdiction (i.e., U.S. Army Corps of Engineers, California Department of Fish and Game, or Regional Water Quality Control Board).

- 1) Use natural drainage systems to the maximum extent practicable, but minimize runoff discharge to the maximum extent practicable.
- 2) Stabilize permanent channel crossings.
- 3) Install energy dissipaters, such as rock riprap, at the outlets of storm drains, culverts, conduits or channels that discharge into unlined channels.

Provide Storm Drain System Stenciling and Signage

Storm drain message markers or placards are required at all storm drain inlets within the project boundary. The signs should be placed in clear sight facing anyone approaching the inlet from either side. All storm drain inlet locations must be identified on the development site map.

Some local agencies within the County have approved storm drain message placards for use. Consult local permitting agency stormwater staff to determine specific requirements for placard types and installation methods.

Divert Roof Runoff and Surface Flows to Vegetated Area(s) or Collection System(s), Unless the Diversion Would Result in Slope Instability



Diverted Roof Runoff
City of Santa Barbara

Disconnecting downspouts divert water from roof gutters to (1) vegetated pervious areas of the site in order to allow for infiltration, storage, evapotranspiration (i.e., evaporation and uptake of water by plants), and treatment, or (2) a rainwater collection system (e.g., a rain barrel or a cistern). Disconnected downspouts differ from conventional downspout systems that provide a direct connection of roof runoff to stormwater conveyance systems (storm drains), which quickly collect and convey stormwater away from the site. “Flow spreading” is a technique used to spread runoff from rooftops, sidewalks, patios, and driveways out over a vegetated pervious area, rather than concentrating and conveying the runoff directly to a stormwater conveyance system.

Dispersion methods include splash blocks, gravel-filled trenches, or other methods which serve to spread runoff over vegetated pervious areas. Sheet flow dispersion is the simplest method and can be used for any impervious or pervious surface that is graded so as to avoid concentrating flows. Because flows are already dispersed as they leave the surface, they only need to traverse through a narrow band of adjacent vegetation for the runoff to be effectively attenuated and treated.

The following requirements apply to runoff diversion:

- Vegetated flowpaths for the diverted flows should be at least 25 feet in length, measured from the diversion location to the downstream property line, structure, steep slope, stream, wetland, or impervious surface. The vegetated flowpath must be covered with well-established lawn or pasture, landscaping with well-established groundcover, or native vegetation with natural groundcover. The groundcover should be dense enough to help disperse and infiltrate flows and to prevent erosion.
- If the vegetated flowpath (measured as defined above) is less than 25 feet, a perforated stub-out connection may be used in lieu of downspout dispersion. A perforated stub-out connection is a length of perforated pipe within a gravel-filled trench that is placed between roof downspouts and a stub-out to the local drainage system. A perforated stub-out may also be used where implementation of downspout dispersion might cause erosion or flooding problems, either onsite or on adjacent lots. This provision might be

appropriate, for example, for lots where dispersed flows might pose a potential hazard for lower lying lots or adjacent offsite lots. Location of the connection should be selected to allow a maximum amount of runoff to infiltrate into the ground (ideally a dry location on the site that is relatively well drained). To facilitate maintenance, the perforated pipe portion of the system should not be located under impervious or heavily compacted (e.g., driveways and parking areas) surfaces. The use of a perforated stub-out in lieu of downspout dispersion may be determined by the Local permitting agency.

- In general, if the ground is sloped away from the foundation and there is adequate vegetation and area for effective dispersion, splash blocks will adequately disperse stormwater runoff. If the ground is fairly level, if the structure includes a basement, or if foundation drains are proposed, splash blocks with downspout extensions may be a better choice because the discharge point is moved away from the foundation. Downspout extensions may include piping to a splash block/discharge point a considerable distance from the downspout, as long as the runoff can travel through a well-vegetated area as described above.
- No erosion or flooding of downstream properties may result.
- Runoff discharged towards steep slopes or landslide hazard areas, including perforated stub-out connections, must be evaluated by a geotechnical engineer or qualified geologist. The discharge point may not be placed on or above slopes greater than 20% or above erosion hazard areas without evaluation by a geotechnical engineer or qualified geologist and jurisdiction approval.
- For sites with septic systems, the discharge point must be down gradient of the drainfield primary and reserve areas. This requirement can be waived by the jurisdiction's permit review staff if site topography clearly prohibits flows from intersecting with the drainfield.

Step 1c: Roadway Projects

Roadway projects have specific requirements separate from other new development and redevelopment project categories. The measures presented in this substep comprise the performance standard for street, roadway, highway, and freeway projects. Section 4.E.II of [Order R4-2010-0108](#) requires street, roadway, highway, and freeway projects that construct 10,000 square feet or more of impervious surface area, to incorporate USEPA guidance regarding [Managing Wet Weather with Green Infrastructure: Green Streets](#) to the maximum extent practicable.

The following requirements apply to the impervious area within the right-of-way associated with public streets, roads, highways, and freeways projects and the streets

that are part of a larger private project. These requirements do not apply to routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility, or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Also, the requirements do not apply to the repaving of existing roads to maintain original line and grade.

Minimum requirements for the impervious area within the right-of-way associated with streets, roads, highways, and freeways are as follows:

- 1) Provide Retention BMPs or Biofiltration BMPs sized to capture and treat the Stormwater Quality Design Volume (SQDV) or the Stormwater Quality design Flow (SQDF) (see [Step 7](#) for guidance on calculating the SQDV and SQDF).

Additional Treatment Control Measures may be integrated into roadway projects if they are used in a treatment train approach with Retention BMPs or Biofiltration BMPs to address the pollutants of concern (see [Section 3.3](#)).

- 2) Projects should apply the following measures to the maximum extent practicable and as specified in the local permitting agency's codes:
 - Minimize street width to the appropriate minimum width for maintaining traffic flow and public safety;
 - Use porous pavement or pavers for low traffic roadways, on-street parking, shoulders or sidewalks; and
 - Add tree canopy by planting or preserving trees and shrubs.

2.3 Step 2: Assess Site Conditions

The next step is to collect site information that is critical for the selection and implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. The following information should be documented: topography, soil type and geology, groundwater, geotechnical considerations, offsite drainage, existing utilities, and Environmentally Sensitive Areas. In addition, soil and infiltration testing should be conducted. Detailed guidance on assessing site conditions can be found in [Section 3.1](#).

2.4 Step 3: Apply Site Design Principles and Techniques

The third step is to apply Site Design Principles & Techniques (see [Section 4](#)). The implementation of LID requires an integrated approach to site design and

stormwater management. Traditional approaches to stormwater management planning within the site planning process are not likely to achieve the LID performance standard of the MS4 Permit. The use of the site planning techniques presented in [Section 4](#) (Site Design Principles & Techniques) will help generate a more hydrologically functional site, maximize the effectiveness of Retention BMPs, and integrate stormwater management throughout the site.

The following criteria should be considered during the early site planning stages:

- Retention BMPs should be considered as early as possible in the site planning process. Hydrology should be a key principle that is integrated into the initial site assessment planning phases. Where flexibility exists, conceptual drainage plans should attempt to route water to areas suitable for Retention BMPs.
- A multidisciplinary approach at the initial phases of the project is recommended and should include planners, engineers, landscape architects, and architects.
- Individual Retention BMPs should be distributed throughout the project site as feasible and may influence the configuration of roads, buildings and other infrastructure.
- The project must demonstrate disconnection of impervious surface such that the 5% EIA requirement is achieved. If fully meeting the 5% EIA requirement using Retention BMPs is not technically feasible, the project must still utilize Retention BMPs to the maximum extent practicable.
- Flood and hydromodification control should be considered early in the design stages. Even sites with Retention BMPs will still have runoff that occurs during large storm events, but Retention facilities can have flood and hydromodification control benefits. It may be possible to simultaneously address flood and hydromodification control requirements through an integrated water resources management approach.

Perhaps the most important aspect of site planning is allowing sufficient space for Retention BMPs in areas that can physically accept runoff. A simple rule of thumb is to allow 3 to 10 percent of the tributary impervious area (depending on how well the soils drain and then allow for more area with less infiltrative soils) for infiltration BMPs and 3 to 5 percent for biofiltration in preliminary design to achieve the 5% Effective Impermeable Area (EIA) standard.

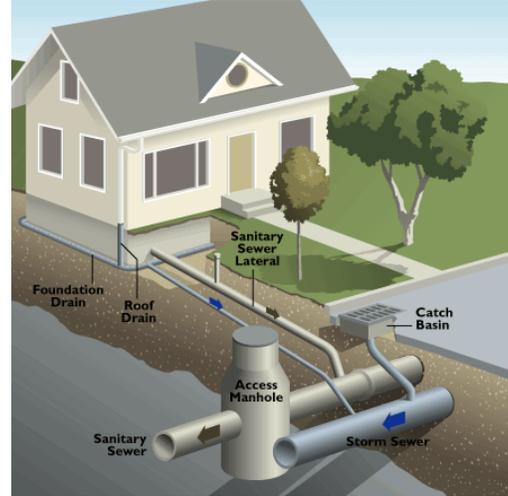
2.5 Step 4: Apply Source Control Measures

All applicable projects must implement applicable Source Control Measures. Source Control Measures are operational practices that reduce potential pollutants at the

source. They typically do not require maintenance or significant construction. Guidance on Source Control Measures can be found in [Section 5](#).

2.6 Step 5: Apply BMPs to Reduce EIA to $\leq 5\%$

According to [Order R4-2010-0108](#), Applicable projects must reduce Effective Impervious Area (EIA) to less than or equal to five percent ($\leq 5\%$) of the total project area, unless infeasible. Impervious surfaces are rendered “ineffective” if the design storm volume is fully retained onsite using either infiltration, rainwater harvesting, and/or evapotranspiration Retention BMPs. Biofiltration BMPs may be used to achieve the 5% EIA standard if Retention BMPs are technically infeasible (see [Section 3.2](#)). This section and [Figure 2-2](#) describe the process for reducing EIA to $\leq 5\%$. Refer to [Section 2.7](#) if Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard (see [Section 3.2](#)).



Effective Impervious Area
Victoria, BC Capital Regional District

Step 5a: Calculate Allowable EIA

EIA is defined as impervious area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume. Connected impervious areas efficiently transport runoff without allowing infiltration. Often in urban areas, runoff from connected impervious surfaces is immediately directed into a stormwater conveyance system where it is further connected and efficiently transported to an outfall (stormwater conveyance system outlet). For example, in this illustration, the rooftop is directly connected via a roof drain and underground solid drain pipe to the storm drain in the street (Note that the sanitary sewer is separate from the storm sewer). The roadway drains to the storm drain through the catch basin. The roof area and roadway area would be considered EIA.

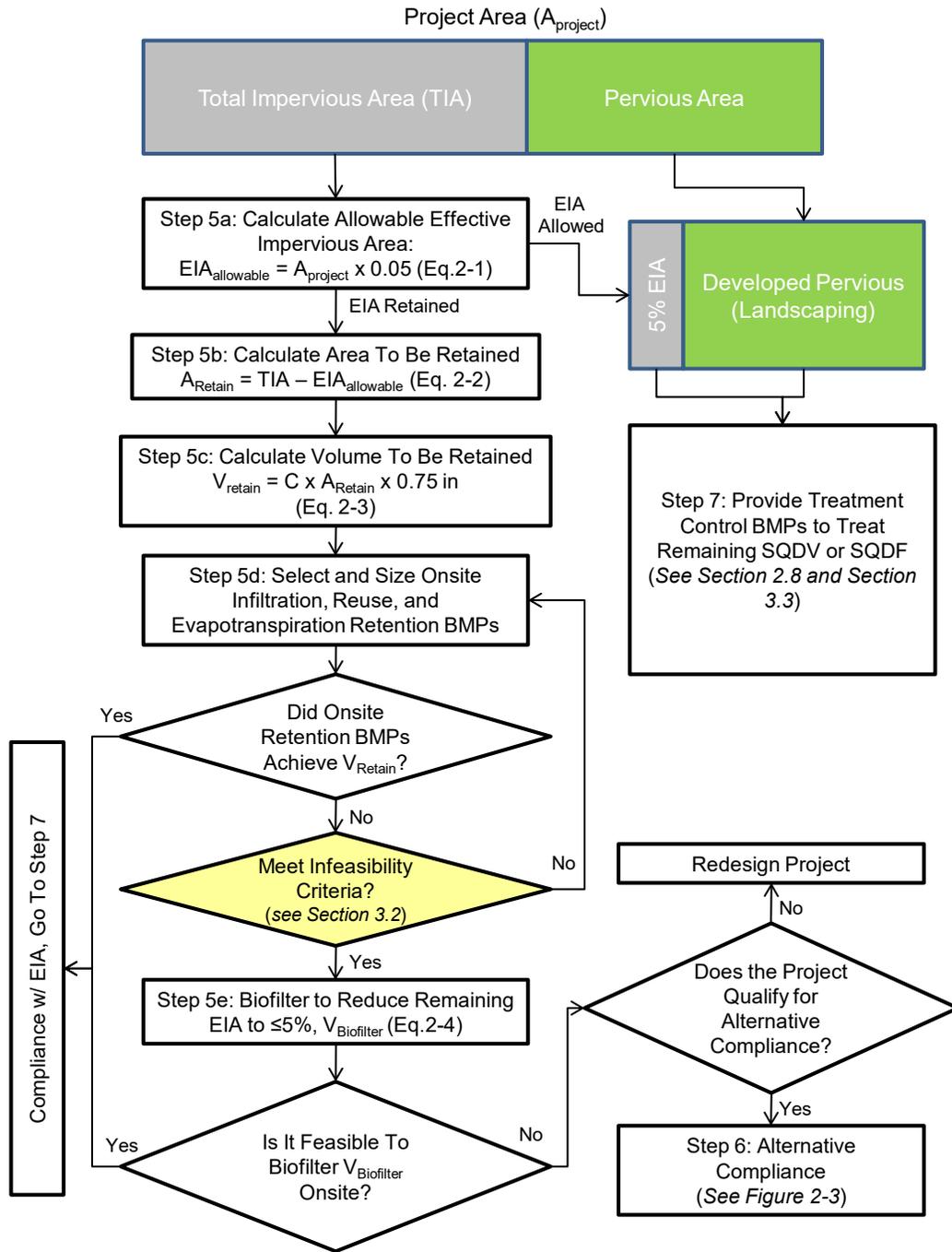


Figure 2-2: Apply BMPs to Reduce EIA to $\leq 5\%$ Process Flow Chart

“Impervious surface” is a man-made hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, compacted gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities and exposed bedrock shall not be considered as impervious surfaces for purposes of determining EIA retention volume.

The allowable EIA for a project site should be calculated as follows:

$$EIA_{\text{allowable}} = (A_{\text{project}}) * (\%_{\text{allowable}}) \quad \text{(Equation 2-1)}$$

Where:

$EIA_{\text{allowable}}$ = the maximum impervious area from which runoff can be treated and discharged offsite [and not retained onsite] (acres)

A_{project} = the total project area (acres).

“Total project area” (or “gross project area”) for new development and redevelopment projects is defined as the disturbed, developed, and undisturbed portions within the project’s property (or properties) boundary, at the project scale submitted for first approval. Areas proposed to be permanently dedicated for open space purposes as part of the project are explicitly included in the “total project area.” Areas of land precluded from development through a restrictive covenant, conservation easement, or other recorded document for the permanent preservation of open space prior to project submittal shall not be included in the “total project area.”

$$\%_{\text{allowable}} = 5 \text{ percent}$$

Step 5b: Calculate Impervious Area to be Retained

The impervious area from which runoff must be retained onsite is the total impervious area minus the $EIA_{\text{allowable}}$, which should be calculated as follows:

$$A_{\text{Retain}} = TIA - EIA_{\text{allowable}} = (\text{IMP} * A_{\text{project}}) - EIA_{\text{allowable}} \quad \text{(Equation 2-2)}$$

Where:

A_{Retain} = the drainage area from which runoff must be retained (acres)

TIA = total impervious area (acres)

$EIA_{\text{allowable}}$	=	the maximum impervious area from which runoff can be treated and discharged offsite [and not retained onsite] (acres).
IMP	=	imperviousness of project area (%) / 100
A_{project}	=	the total project area (acres)

Step 5c: Calculate the Volume to be Retained (SQDV)

All Retention BMPs used to render impervious surfaces "ineffective" should be properly sized to retain the volume of water that results from the water quality design storm. The design storm volume, referred to in the TGM as the [Stormwater Quality Design Volume \(SQDV\)](#) shall be calculated using the following four allowable methodologies:

- 1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or
- 2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or
- 3) The volume of runoff produced from a 0.75 inch storm event; or
- 4) Eighty (80) percent of the average annual runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Note: Examples used throughout the 2011 TGM use the 0.75 inch storm event (Methodology #3).

EXAMPLE 2-1: EIA CALCULATION

Given: 10 acre total project area, 55% impervious, 25% landscaped, 20% undisturbed, percent allowable EIA = 5%.

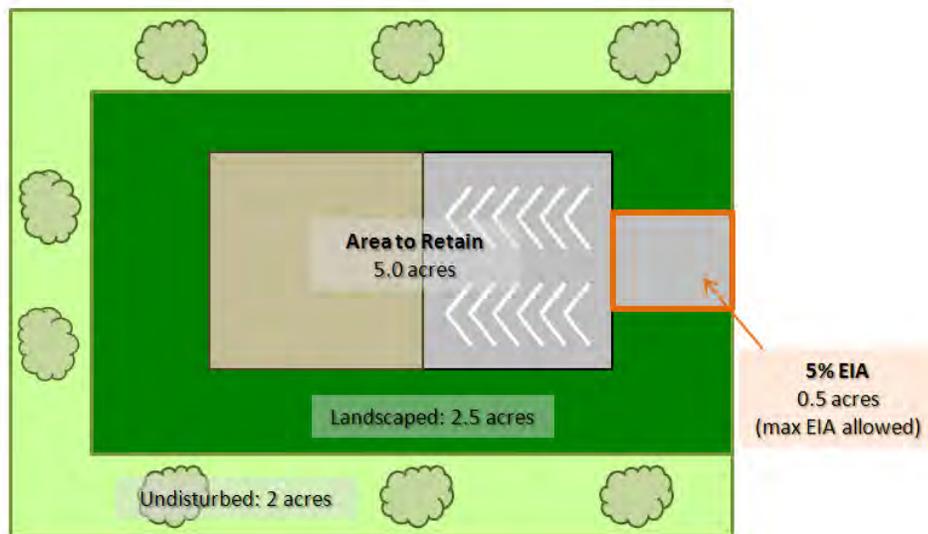
$$EIA_{\text{allowable}} = 10 * 0.05 = 0.5 \text{ acres}$$

$$A_{\text{Retain}} = (0.55 * 10) - 0.5 = 5.0 \text{ acres}$$

$$A_{\text{treatment}} = (0.25 * 10) + 0.5 = 3.0 \text{ acres}$$

The maximum EIA allowed for the site is 0.5 acres, from which the generated runoff must be treated prior to discharge, in addition to the runoff from the 2.5 acres landscaped area, up to the design storm volume or flow rate. The runoff volume generated from the remaining 5 acre impervious area (A_{Retain}) must be retained onsite via infiltration, rainwater harvesting, and/or evapotranspiration Retention BMPs.

$A_{\text{treatment}}$ equals the EIA allowed for the site plus the landscaped area.



Note: graphic not to scale; for illustration purposes only

The runoff volume that is to be retained onsite should be calculated using Equation 2-3 below:

$$V_{\text{Retain}} = C * (0.75 / 12) * A_{\text{retain}} \tag{Equation 2-3}$$

Where:

V_{Retain} = the stormwater quality design volume (SQDV) that must be retained onsite (ac-ft)

C	=	runoff coefficient (equals 0.95 for impervious surfaces)
0.75	=	the design rainfall depth (in) [based on SQDV sizing method 3]
A_{Retain}	=	the drainage area from which runoff is retained (acres), calculated using Equation 2-2

EXAMPLE 2-2: RETENTION VOLUME CALCULATION

Given: $A_{\text{Retain}} = 5.0$ acres (from Example 2-1); runoff coefficient (C) = 0.95

$$V_{\text{Retain}} = 0.95 * (0.75 / 12) * 5.0 \text{ acres} = 0.3 \text{ acre-feet}$$

The project must retain at least 0.3 acre-feet of runoff from impervious surfaces using Retention BMPs.

Step 5d: Select and Size Onsite Retention BMPs to Achieve 5% EIA

The next step is to select and size Retention BMPs, based on the site assessment design, and constraints. [Section 3-4](#) provides guidance on the selection of Retention BMPs. The project must demonstrate disconnection of impervious area such that the 5% EIA requirement is achieved.

Step 5e: Select and Size Biofiltration BMPs to Reduce EIA to ≤5%

Retention BMPs shall be used onsite to the maximum extent practicable. Pretreatment BMPs shall be provided for all infiltration BMPs and other Retention BMPs as needed (see [Section 6.1](#)).

New development and redevelopment projects that demonstrate [technical infeasibility](#) for reducing EIA to ≤5% using Retention BMPs are eligible to use Biofiltration BMPs to achieve the EIA performance standard.

The project applicant shall demonstrate [technical infeasibility](#) by submitting a site-specific analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect. [Section 3.2](#) discusses technical feasibility screening criteria. Projects that cannot demonstrate technical infeasibility shall meet the requirement to reduce EIA to ≤5% using Retention BMPs. Otherwise project applicants must examine other options for meeting the requirements, such as redesigning the site.

Volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs.

The onsite biofiltered volume ($V_{\text{Biofilter}}$), should be calculated as follows:

$$V_{\text{Biofilter}} = (V_{\text{Retain}} - V_{\text{Achieved}}) * 1.5 \quad \text{(Equation 2-4)}$$

Where:

- $V_{\text{Biofilter}}$ = the volume that must be captured and treated in a Biofiltration BMP (ac-ft)
- V_{Retain} = the stormwater quality design volume (SQDV) that must be retained (ac-ft) (established in Step 5c)
- V_{Achieved} = the volume retained onsite using Retention BMPs (ac-ft)

EXAMPLE 2-3: BIOFILTRATION VOLUME CALCULATION

Given: $V_{\text{Retain}} = 0.3$ ac-ft (from Example 2-2); $V_{\text{Achieved}} = 0.25$ ac-ft

$$V_{\text{Biofilter}} = (0.3 - 0.25) * 1.5 = 0.075 \text{ ac-ft}$$

If the project applicant has demonstrated technical infeasibility, the remaining EIA requirement may be met by biofiltering 1.5 times the remaining V_{Retain} . In this case, the Biofiltration BMP must be sized to treat 0.075 ac-ft.

If the project applicant has demonstrated technical infeasibility, the remaining EIA requirement may also be satisfied with flow-based Biofiltration BMPs. Flow-based Biofiltration BMPs shall be sized for the remaining drainage area from which runoff must be retained (A_{Retain}) using the methodology described in Section 2.8, [Stormwater Quality Design Flow](#), with a rainfall intensity that varies with time of concentration for the catchment tributary to the flow-based Biofiltration BMP, according to Table 2-1.

Table 2-1: Flow-Based Biofiltration BMP Design Intensity for 150% Sizing

Time of Concentration, minutes	Design Intensity for 150% Sizing, in/hr
30	0.24
20	0.25
15	0.28
10	0.31
5	0.35

Time of concentration should be determined using the methodology provided in the Ventura County Hydrology Manual.

2.7 Step 6: Alternative Compliance

Certain new development and redevelopment project types are eligible for alternative compliance measures if onsite Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard (see [Section 3.2](#)). Such projects include:

- 1) Redevelopment projects (as defined in [Section 1.5](#)).
- 2) Infill projects. Infill projects meet the following conditions:
 - a. The project is consistent with applicable general plan designation, and all applicable general plan policies, and applicable zoning designation and regulations;
 - b. The proposed development occurs on a project site of no more than five acres substantially surrounded by urban uses;
 - c. The project site has no value as habitat for endangered, rare, or threatened species;
 - d. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and
 - e. The site can be adequately served by all required utilities and public services (modified from State Guidelines § 15332).
- 3) Smart Growth projects. Smart Growth projects are defined as new development and redevelopment projects that occur within existing urban areas² (see maps in Appendix B) designed to achieve the majority of the following principles³:
 - a. Create a range of housing opportunities and choices;
 - b. Create walkable neighborhoods;
 - c. Mix land uses;

² Existing urban areas and corresponding maps in Appendix B are based on the cities' City Urban Restriction Boundaries (CURB) lines and in the case of the unincorporated County, the Existing Community designation. These boundaries are a growth management tool intended to channel growth and protect agricultural and open-space land. The 2011 TGM utilizes existing urban areas (as defined in Appendix B) to provide parameters around eligibility for alternative compliance in two areas: 1) Smart Growth and 2) low income housing projects.

³ Adapted from the Smart Growth Network's Smart Growth Principles in cooperation with the U.S. Environmental Protection Agency.

- d. Preserve open space, natural beauty, and critical areas;
 - i. Farmland preservation may also be considered for projects occurring outside existing urban areas (as defined by the Appendix B maps).
- e. Provide a variety of transportation choices;
 - i. Includes transit oriented development (development located within an average 2,000 foot walk to a bus or train station).⁴
- f. Strengthen and direct development towards existing communities (as defined by Appendix B maps); and
- g. Take advantage of compact building design.

The City or County Planning Division in which a project is proposed will ultimately determine whether a project meets these Smart Growth criteria.

4) Pedestrian/bike trail projects:

- ✓ Located along side of a road and
- ✓ Where right-of-way width is inadequate for the implementation of Retention and/or Biofiltration BMPs.

5) Agency flood control, drainage, and wet utilities projects:

- ✓ Located within waterbody and is therefore not increasing functional impervious cover; or
- ✓ Located on top of a narrow flood control feature (such as a levee) and space is unavailable for the implementation of Retention and/or Biofiltration BMPs; or
- ✓ Where the integrity of the flood control feature (such as a dam or levee) may be compromised through Retention and/or Biofiltration BMPs (e.g., infiltration of stormwater is not appropriate in a levee).

6) Historical preservation projects:

- ✓ Where the extent of the designated preservation area restricts the amount of land available for the implementation of Retention BMPs.

⁴ Calthorpe, P. (1993), "The next American metropolis: Ecology, community, and the American dream", New York: Princeton Architectural Press.

- 7) Low income housing projects that occur within existing urban areas (as defined by the maps provided in Appendix B):
- ✓ Where density requirements restrict the amount of land available for the implementation of Retention BMPs and/or
 - ✓ Where project financing constraints restrict the amount of land available for the implementation of Retention BMPs.

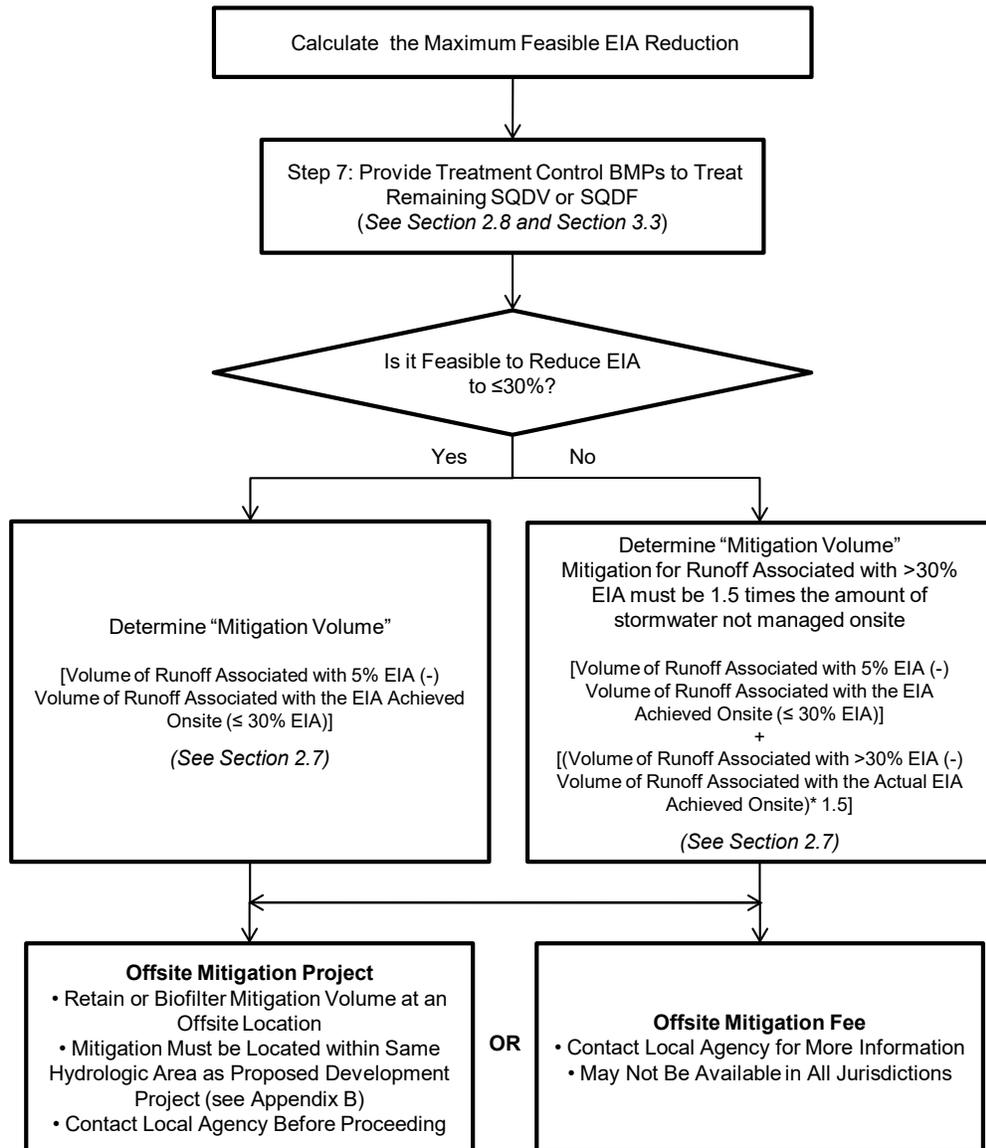


Figure 2-3: Alternative Stormwater Management Control Measures Compliance Decision Flow Chart

Projects in these categories must demonstrate that full compliance with the 5% EIA standard using Retention BMPs and Biofiltration BMPs is infeasible prior to moving to the alternative compliance flowchart (Figure 2-3) and selecting an offsite mitigation alternative. [Section 3.2](#) provides infeasibility criteria.

Stormwater runoff from impervious surfaces and developed pervious surfaces that is not fully retained onsite (up to the SQDV) shall be mitigated using Treatment Control Measures [[Chapter 6](#)] selected per the BMP selection process outlined in [Section 3.3](#), in addition to offsite alternative compliance measures.

Alternative compliance may be met through two options:

- Offsite mitigation project; or
- Offsite mitigation fee.

In either case, the Project applicant must contact the local approval agency before proceeding with Alternative Compliance.

Mitigation Volume

Projects requesting alternative compliance must demonstrate that EIA has been reduced to the maximum extent practicable. Additionally, the SQDV or SQDF from all directly connected impervious area and the developed pervious project area must be captured and treated within the project site.

Alternative compliance options will be based on the “mitigation volume.” The mitigation volume is the difference between the volume of runoff associated with 5% EIA and the volume of runoff associated with the actual EIA achieved onsite less than or equal to 30% ($\leq 30\%$) EIA. The offsite mitigation requirement for EIA in excess of 30% ($>30\%$) is 1.5 times the amount of stormwater not managed onsite.

Projects Feasible to Reduce EIA to $\leq 30\%$

- 1) Determine the volume of runoff that is retained and biofiltered onsite ($V_{Ret/Bio}$), using Equation 2-5 below:

$$V_{Ret/Bio} = (V_{Achieved} + (V_{Biofiltered}/1.5)) \quad \text{(Equation 2-5)}$$

Where:

$V_{Ret/Bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs

$V_{Achieved}$ = the runoff volume retained onsite using Retention BMPs as calculated in [Equation 2-4](#)

$V_{Biofiltered}$ = the runoff volume biofiltered onsite

2) Determine the Mitigation Volume ($V_{Mitigation}$), using Equation 2-6 below:

$$V_{Mitigation} = V_{Retain} - V_{Ret/Bio} \quad (\text{Equation 2-6})$$

Where:

$V_{Mitigation}$ = the volume of runoff that must be mitigated offsite

V_{Retain} = the SQDV that must be retained onsite per the 5% EIA requirement calculated in [Equation 2-3](#)

$V_{Ret/Bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs calculated in [Equation 2-5](#)

EXAMPLE 2-4: ≤30% EIA OFFSITE MITIGATION VOLUME CALCULATION

Given: $V_{\text{Retain}} = 0.3$ ac-ft (from Example 2-2); $V_{\text{Retained}} = 0.25$ ac-ft; $V_{\text{Biofiltered}} = 0.06$ ac-ft

- 1) Calculate volume of runoff retained and biofiltered onsite ($V_{\text{Ret/Bio}}$).

$$V_{\text{Ret/Bio}} = 0.25 + (0.06/1.5) = 0.29 \text{ ac-ft} \quad [\text{See Equation 2-5}]$$

- 2) Calculate Mitigation Volume: ($V_{\text{Mitigation}}$):

$$V_{\text{Mitigation}} = 0.3 - 0.29 = 0.01 \text{ acre-feet} \quad [\text{See Equation 2-6}]$$

The required offsite mitigation volume is 0.01 ac-ft.

In addition, the SQDV or SQDF from the EIA (0.5 acres) and the developed pervious area (10 acres * 25% = 2.5 acres) must be captured and treated in an approved Treatment Control Measure.

$$\text{SQDV (acre-feet)} = C * (0.75/12) * 3 \text{ acres}$$

OR

$$\text{SQDF (cfs)} = C * 0.20 \text{ in/hr} * 3 \text{ acres}$$

Note: Per [Order R4-2010-0108](#), several options exist to determine the SQDV and SQDF. Examples used throughout the 2011 TGM use the 0.75 inch storm event ([SQDV Methodology #3](#)) for the SQDV and 0.2 inches per hour intensity for the SQDF ([SQDF Methodology #1](#)). For these examples, the 10-acre project site is assumed to be in a location where the 85th percentile storm event is equal to 0.75 inches.

Projects with EIA > 30%

For the scenario where the effective impervious area of the project is greater than 30% due to infeasibility, the runoff volume associated with the effective impervious area up to 30% must be mitigated offsite at a one-to-one ratio and the runoff volume associated with the effective impervious area greater than 30% must be mitigated off-site at 1.5 times the volume.

- 1) Determine the area of the impervious portion of the drainage area from which runoff is retained or biofiltered at 30% EIA ($A_{30\%EIA}$), using Equation 2-7 below:

$$A_{30\%EIA} = (\text{IMP} * A_{\text{project}}) - (30\% * A_{\text{project}}) \quad (\text{Equation 2-7})$$

Where:

- $A_{30\%EIA}$ = the impervious portion of the drainage area from which runoff would have been retained or biofiltered at 30% EIA (acres)
- IMP = total imperviousness of project area (%) / 100
- $A_{project}$ = the total project area (acres)

2) Determine the total volume that would have been retained or biofiltered onsite at 30% EIA ($V_{30\%EIA}$), using Equation 2-8 below:

$$V_{30\%EIA} = C * (0.75 / 12) * A_{30\%EIA} \quad \text{(Equation 2-8)}$$

Where:

- $V_{30\%EIA}$ = the stormwater quality design volume (SQDV) retained or biofiltered at 30% EIA (note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)
- C = runoff coefficient [equals 0.95 for impervious surfaces]
- 0.75 = the design rainfall depth (in) [based on SQDV sizing method 3]
- $A_{30\%EIA}$ = the impervious area from which runoff would have been retained or biofiltered at 30% EIA (acres) [See [Equation 2-7](#)]

3) Determine the impervious area from which runoff is actually retained ($A_{ActualEIA}$). This is the total amount of impervious area that drains to properly sized Retention or Biofiltration BMPs.

$$A_{ActualEIA} = (IMP * A_{project}) - (EIA\% * A_{project}) \quad \text{(Equation 2-9)}$$

Where:

- $A_{ActualEIA}$ = the impervious portion of the drainage area from which runoff is retained or biofiltered using the actual EIA achieved on-site (acres)
- IMP = total imperviousness of project area (%) / 100
- $A_{project}$ = the total project area (acres)
- EIA% = percent EIA actually achieved on-site

4) Determine the volume that is actually retained onsite ($V_{ActualEIA}$), using Equation 2-10 below:

$$V_{ActualEIA} = C*(0.75/12)*A_{ActualEIA} \quad \text{(Equation 2-10)}$$

Where:

$V_{ActualEIA}$ = the stormwater quality design volume (SQDV) that is retained and/or biofiltered onsite C = runoff coefficient [equals 0.95 for impervious surfaces]

0.75 = the design rainfall depth (in) [based on SQDV sizing method 3]

$A_{ActualEIA}$ = the area associated with the Actual EIA achieved onsite, (i.e., the area from which runoff is retained or biofiltered (acres) [See # 3 above]

Determine the Mitigation Volume for 30% EIA using Equation 2-11 below:

$$V_{Mitigation30\%} = V_{Retain} - V_{30\%EIA} \quad \text{(Equation 2-11)}$$

Where:

$V_{Mitigation30\%}$ = the mitigation volume for Project site with 30% EIA

V_{Retain} = the SQDV that must be retained onsite per the 5% EIA requirement, calculated using [Equation 2-3](#)

$V_{30\%EIA}$ = the runoff that would have been retained and/or biofiltered at 30% EIA (note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier), calculated using [Equation 2-8](#)

Determine the Mitigation Volume for >30% (EIA $V_{Mitigation>30\%}$), using Equation 2-12 below:

$$V_{Mitigation>30\%} = (V_{30\%EIA} - V_{ActualEIA})*1.5 \quad \text{(Equation 2-12)}$$

Where:

$V_{Mitigation>30\%}$ = the mitigation volume for >30% EIA

$V_{30\%EIA}$ = the stormwater quality design volume (SQDV) retained or biofiltered at 30% EIA (note: for the

purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)

$V_{\text{ActualEIA}}$ = the stormwater quality design volume (SQDV) that is actually retained and/or biofiltered onsite, calculated using [Equation 2-9](#)

Determine the Total Mitigation Volume ($V_{\text{MitigationTotal}}$), using Equation 2-13 below:

$$V_{\text{MitigationTotal}} = V_{\text{Mitigation}>30\%} + V_{\text{Mitigation}30\%} \quad (\text{Equation 2-13})$$

Where:

$V_{\text{MitigationTotal}}$ = the total mitigation volume for 30% EIA

$V_{\text{Mitigation}>30\%}$ = the mitigation volume for >30% EIA, calculated using [Equation 2-11](#)

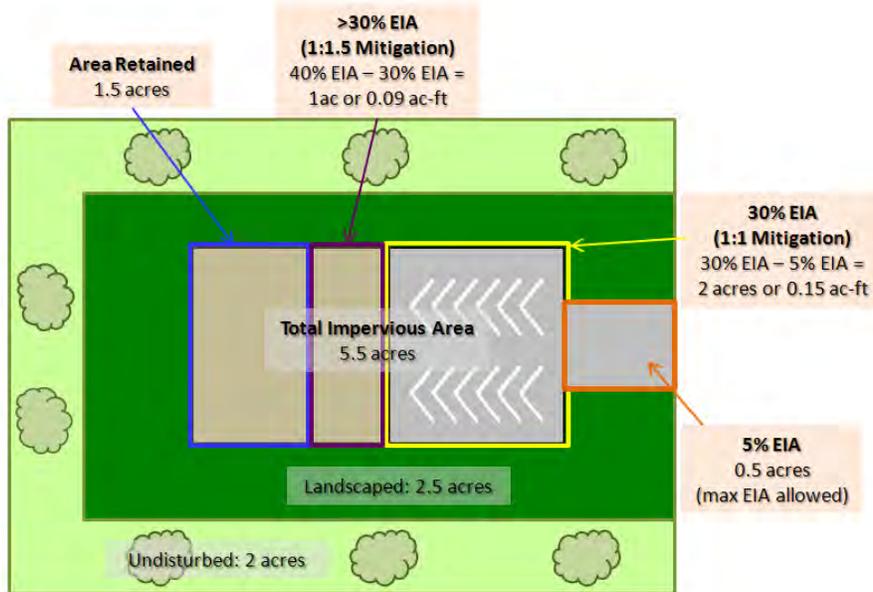
$V_{\text{Mitigation}30\%}$ = the mitigation volume for 30% EIA calculated using [Equation 2-10](#).

EXAMPLE 2-5: >30% EIA OFFSITE MITIGATION CALCULATION

Given: 40% EIA; 10 acre total project area, 55% impervious, 25% landscaped, 20% undisturbed; runoff coefficient (C) = 0.95; $V_{\text{Retain}} = 0.3$ ac-ft

- 1) Determine impervious area retained or biofiltered onsite at 30% EIA
 $A_{30\%EIA} = ((55/100)*10) - ((30/100)*10) = 2.5$ acres [See [Equation 2-7](#)]
- 2) Determine the volume that is retained or biofiltered onsite at 30% EIA
 $V_{30\%EIA} = 0.95*(0.75/12)*2.5 = 0.15$ ac-ft [See [Equation 2-8](#)]
- 3) Determine the impervious area from which runoff is actually retained
 $A_{\text{ActualEIA}} = ((55/100)*10) - ((40/100)*10) = 1.5$ acres [See [Equation 2-9](#)]
- 4) Determine the volume that is actually retained or biofiltered onsite
 $V_{\text{ActualEIA}} = 0.95*(0.75/12)*1.5 = 0.09$ ac-ft [See [Equation 2-10](#)]
- 5) Determine Mitigation Volume for 30% EIA
 $V_{\text{Mitigation}30\%} = 0.3 - 0.15 = 0.15$ ac-ft [See [Equation 2-11](#)]
- 6) Determine Mitigation Volume for >30%
 $V_{\text{Mitigation}>30\%} = (0.15-0.09) *1.5 = 0.09$ ac-ft [See [Equation 2-12](#)]
- 7) Determine the Total Mitigation Volume
 $V_{\text{MitigationTotal}} = 0.15 + 0.09 = 0.24$ ac-ft [See [Equation 2-13](#)]

The required offsite mitigation volume is 0.24 ac-ft



Selecting Offsite Mitigation Projects

Project applicants may identify offsite mitigation projects. Project applicants are responsible for completing offsite mitigation projects that will achieve equivalent volume and pollutant load reduction using Retention and/or Biofiltration BMPs sized for the mitigation volume. Offsite mitigation projects must adhere to the following criteria:

- Offsite mitigation projects must be located within the same hydrologic area (see map in Appendix B)
- Offsite mitigation projects must be completed as soon as possible and at the latest, within 4 years of the certificate of occupancy for the original project.

Examples of Offsite Mitigation Projects

Mitigation projects should target urbanized areas that were developed without stormwater mitigation. All projects must be approved by the local permitting agency and must adhere to the BMP Selection Criteria presented in [Section 3.3](#) of the 2011 TGM. Potential project types may include:

- Convert a convex parking lot landscaped island into a depressed bioretention area designed to retain parking lot runoff.
- Convert a traditionally-paved parking lot into porous pavement.
- Modify an existing detention pond into a retention pond.
- Install bioretention in bump-outs, in parkways, or in roadway medians.
- Install bioretention in sidewalk areas to infiltrate roof, sidewalk, and/or roadway runoff. Sidewalks must be wide enough to permit foot traffic around bioretention area.
- Incorporate infiltration BMPs into landscaped areas that collect runoff from impervious surfaces.
- Regional BMPs.

Offsite Mitigation Fee

In some cases, Alternative Compliance may be achieved through an Offsite Mitigation Fee. A list of offsite mitigation projects available for funding will be identified by the Approval Agencies. Applicants should contact their local Approval Agency for more information. The Offsite Mitigation Fee may not be available in all jurisdictions.

2.8 Step 7: Apply Treatment Control Measures

Stormwater runoff from EIA and developed pervious surfaces shall be mitigated using Retention BMPs, Biofiltration BMPs, or Treatment Control Measures [[Chapter 6](#)] selected per the BMP selection process outlined in [Section 3.3](#). Biofiltration BMPs and Treatment Control Measures may be sized to meet the Stormwater Quality Design Volume (SQDV) or the Stormwater Quality Design Flow (SQDF). Treatment Control Measures should be designed in adherence with the guidance provided in [Section 6](#) of the 2011 TGM in order to assure a level of pollutant removal comparable to those listed in Attachment “C” of [Order R4-2010-0108](#) (also provided in Appendix D.1).

Projects that are eligible for Offsite Mitigation must still provide treatment for all impervious surfaces and developed pervious areas using Treatment Control Measures sized to meet the SQDV or SQDF on site. Treatment Control Measures must be selected per the BMP selection process outlined in [Section 3.3](#).

Stormwater Quality Design Volume (SQDV)

Volume-based Treatment Control Measures must be sized to capture and treat the runoff volume from the water quality design storm. The SQDV shall be calculated using the following four allowable methodologies:

- 1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or
- 2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or
- 3) The volume of runoff produced from a 0.75 inch storm event; or
- 4) Eighty (80) percent of the average annual runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

The allowable design storm calculation methodology for Treatment Control Measures, per [Order R4-2010-0108](#), is determined by the total project disturbed land area, as summarized in Table 2-2 below.

Table 2-2: Allowed Design Storm Methodology Based on Project Size

Project Size (Disturbed Land Area ¹)	Allowed Design Storm Methodology
Less than 5 acres	(1), (2), (3), or (4)
5 acres - 50 acres	(1), (2), or (4)
More than 50 acres	(4)

¹ “Disturbed Area” means any area that is altered as a result of land disturbance, such as clearing, grading, grubbing, stockpiling or excavation.

Instructions for calculating the SQDV based on method (3), the volume of runoff produced from a 0.75 inch storm event, are provided below. Instructions for calculating the SQDV for methods (1), (2), and (4) are provided in Appendix E. Note that Biofiltration BMPs must be sized to treat 1.5 times the volume not retained using Retention BMPs as indicated in [Step 5e](#).

Calculation Procedure

- 1) Determine the area from which runoff must be retained or captured and treated (A_{project}).
- 2) Determine the runoff coefficient (C), using Equation 2-13 below:

$$C = 0.95 \cdot \text{imp} + C_p (1 - \text{imp}) \quad \text{(Equation 2-13)}$$

Where:

C = runoff coefficient (equals 0.95 for impervious surfaces)

imp = impervious fraction of watershed

C_p = pervious runoff coefficient, determined based on soil type using table below [see [Ventura County Hydrology Manual](#) (2006)]:

Table 2-3: Ventura Soil Type Pervious Runoff Coefficients

Ventura Soil Type (Soil Number)	C _p value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

- 3) Determine the stormwater runoff design volume (SQDV), using Equation 2-14 below:

$$SQDV = C*(0.75/12)* A_{project} \quad \text{(Equation 2-14)}$$

Where:

SQDV = the stormwater quality design volume (acre-feet)

C = runoff coefficient, calculated by Equation 2-13

0.75 = the design rainfall depth (in) [based on sizing method (3)]Atrib

A_{project} = drainage area of the tributary catchment (acres)

Stormwater Quality Design Flow (SQDF)

For the purposes of the 2011 TGM, instructions for calculating the SQDF based on method (1), the flow of runoff produced from a rainfall event equal to at least 0.2 inches per hour intensity, are provided below. Instructions for calculating the SQDF for methods (2), and (3) are provided in Appendix E. Note that flow-based Biofiltration BMPs used to achieve 5% EIA must be sized per the design intensity specified in [Table 2-1](#).

Calculation Procedure

- 1) Determine the drainage area from which the flow-based BMP will be receiving runoff (A_{project}).
- 2) Calculate the runoff coefficient (C), using [Equation 2-13](#).

3) Calculate the SQDF using Equation 2-15 below:

$$SQDF = C * I * A_{\text{project}} \quad \text{(Equation 2-15)}$$

Where:

SQDF = flow in cubic feet per second (cfs)

C = runoff coefficient, calculated by [Equation 2-13](#) above

I = average rainfall intensity (inches/hour) for a duration equal to the time of concentration of the watershed [equal to 0.2 in/hr for method (1); see also [Table 2-1](#).]

A_{project} = drainage area of the tributary catchment (acres)

2.9 Step 8: Continue Project Design Process: Flood Control and Hydromodification Requirements

The project applicant should continue with the design process to address additional requirements including flood control and hydromodification control criteria.

Step 8a: Flood Control Requirements

Applicants shall comply with Ventura County and local approval agency regulations on floodplain and floodway management.

Step 8b: Hydromodification (Flow/Volume/Duration) Control Criteria

Projects meeting the applicability criteria contained in Section 4.E.II of [Order R4-2010-0108](#) (presented in [Section 1.5](#) of the 2011 TGM) are required to implement hydrologic control measures to prevent accelerated erosion and to protect stream habitat in downstream natural drainage systems. Natural drainage systems are defined as unlined or unimproved (not engineered) creeks, streams, rivers and their tributaries.

Exemptions

The following new development and redevelopment projects are exempt from the hydromodification control criteria:

- 1) Single-family structures, unless such projects disturb one acre or more of land or create, add, or replace 10,000 square feet or more of impervious surface area.
- 2) All projects that disturb less than one acre.

- 3) Projects that are replacement, maintenance, or repair of an Agency's existing flood control facility, storm drain, or transportation network.
- 4) Redevelopment projects in existing urban areas [see maps in Appendix B] that do not increase the effective impervious area or decrease the infiltration capacity of pervious areas compared to the pre-developed condition.
- 5) Projects that have any increased discharge directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q100) of 25,000 cubic feet per second (cfs) or more, or other receiving water that is not susceptible to hydromodification impacts.
- 6) Projects that discharge directly or via a storm drain into concrete or improved (not natural) channels (e.g., rip rap, sackcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts (as in #5 above).

Hydromodification Control Measures

The purpose of Hydromodification Control Measures is to minimize changes in post-development stormwater runoff discharge rates, velocities, and durations by maintaining within a certain tolerance, the project's pre-developed stormwater runoff flow rates and durations.

Hydromodification Control Measures may include onsite, subregional, or regional Hydromodification Control Measures, Retention BMPs, or stream restoration measures. Preference must be given to onsite Retention BMPs and Hydromodification Control Measures. In-stream restoration measures may not adversely affect the beneficial uses of natural drainage systems.

The Southern California Stormwater Monitoring Coalition (SMC) is developing a regional methodology to eliminate or mitigate the adverse impacts of hydromodification as a result of urbanization, including hydromodification assessment and management tools. The Program will develop and implement watershed-specific Hydromodification Control Plans (HCPs) after the completion of the SMC study. Until the completion of the HCPs, the Interim Hydromodification Control Criteria, described below, apply to applicable, non-exempt new development and redevelopment projects.

Interim Hydromodification Control Criteria

- 1) Projects disturbing less than 50 acres must comply with the Stormwater Management Standards contained in the 2011 TGM (i.e., a combination of Retention BMPs, Biofiltration BMPs, and/or Treatment Control Measures).
- 2) Projects disturbing 50 acres or greater must develop and implement a Hydromodification Analysis Study (HAS) that demonstrates that post development conditions are expected to approximate the pre-developed erosive

effect of sediment transporting flows in receiving waters. The HAS must lead to the incorporation of project design features intended to approximate, to the extent feasible, an Erosion Potential value of 1, or any alternative value that can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat in natural drainage systems. The methodology for calculating Erosion Potential is provided in [Appendix E](#) of [Order R4-2010-0108](#). Project proponents must work with their local permitting authority to ensure that the HAS is correctly prepared.

2.10 Step 9: Develop Maintenance Plan

The Ventura Countywide Stormwater Quality Management Program (Program) requires the submittal of a Maintenance Plan and execution of a Maintenance Agreement with the owner/operator of any stormwater control that requires maintenance including Site Design Principles and Techniques (Section 4); Source Control Measures (Section 5; and Retention BMPs, Biofiltration BMPs, and Treatment Control Measures (Section 6). Maintenance Plans must include guidelines for how and when inspection and maintenance should occur for each control. [Section 7](#) and Appendices H and I provide additional information and guidance on compliance with maintenance requirements.

3 SITE ASSESSMENT AND BMP SELECTION

3.1 Assessing Site Conditions and Other Constraints

Assessing a site's potential for implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures requires both the review of existing information and the collection of site-specific measurements. Available information regarding site layout and slope, soil type, geotechnical conditions, and local groundwater conditions should be reviewed as discussed below. In addition, soil and infiltration testing should be conducted to determine if stormwater infiltration is feasible and to determine the appropriate design infiltration rates for infiltration-based treatment BMPs.

Site Conditions

Topography

The site's topography should be assessed to evaluate surface drainage and topographic high and low points, as well as to identify the presence of steep slopes that qualify as Hillside Locations. All of these conditions have an impact on what type of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures will be most beneficial for a given project site. Stormwater infiltration is more effective on level or gently sloping sites. Flows on slopes steeper than 15% may runoff as surface flows, rather than infiltrate into the ground. On hillsides, infiltrated runoff may daylight or resurface a short distance downslope, which could cause slope instability depending on the soil or geologic conditions. See the [Geotechnical Considerations](#) section below.

Soil Type and Geology

The site's soil types and geologic conditions should be determined to evaluate the site's ability to infiltrate stormwater and to identify suitable, as well as unsuitable, locations for infiltration-based BMPs (e.g., infiltration basins and trenches, bioretention without an underdrain, permeable pavement, and drywells). Using the Soil Survey completed by the Soil Conservation Service (SCS) (now identified as the Natural Resource Conservation Service [NRCS]) of the U. S. Department of Agriculture in April 1970, soils in Ventura County were grouped into seven hydrologically homogeneous families [see [Ventura County Hydrology Manual](#) (2006); also see Appendix B]. Two families were assigned to each of the NRCS Hydrologic Soil Groups A, B, and C; while only one family was considered appropriate for NRCS Hydrologic Soil Group D [for further information, see <http://soils.usda.gov/>]:

- Group A soils are typically sands, loamy sands, or sandy loams. Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep and well to excessively drained sands or

gravels and have a high rate of water transmission. Ventura County soil numbers 6 and 7 are Group A soils.

- Group B soils are typically silty loams or loams. They have a moderate infiltration rate when thoroughly wetted and consist chiefly of moderately deep to deep and moderately well to well drained soils with moderately fine to moderately coarse texture. Ventura County soil numbers 4 and 5 are Group B soils.
- Group C soils are typically sandy clay loams. They have low infiltration rates when thoroughly wetted, consist chiefly of soils with a layer that impedes downward movement of water, and/or have moderately fine to fine soil structure. Ventura County soil numbers 2 and 3 are Group C soils.
- Group D soils are typically clay loams, silty clay loams, sandy clays, silty clays, or clays. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, permanent high water table, claypan or clay layer at or near the surface, and/or shallow soils over nearly impervious material. Ventura County soil number 1 is a Group D soil.

Infiltration-based BMPs should be feasible in areas mapped with Ventura County Soil Numbers 4 through 7. If site-specific data is available, then soils with infiltration rates of 0.5 in/hr or greater are considered feasible for infiltration. Infiltration-based BMPs should not be designed for sites mapped with Ventura County Soil Numbers 1 through 3 (unless site specific testing is performed and shows an infiltration rate greater than 0.5 in/hr) or with site-specific infiltration rates less than 0.5 in/hr.

Locations where soils are mapped with Ventura Hydrology Manual Soil Number 3, or where a site-specific analyses show that the soils have an infiltration rate of 0.3 to 0.5 inches per hour, and no other infiltration-related infeasibility criteria apply, shall use a [Bioinfiltration BMP](#) (or Rainwater Harvesting). Bioinfiltration is an adaption of the Bioretention with an Underdrain BMP in which the underdrain is raised above the gravel storage layer in order to promote infiltration but allow release of biotreated runoff to the storm drain when infiltration capacity is reached.

Early identification of soil types throughout the project footprint can reduce the number of test pit investigations and infiltration tests needed. Early identification reduces the number of potential test sites to locations with those that are most likely to be amenable to infiltration. Guidance for conducting test pit investigations and infiltration tests is provided in Appendix C.

Project applicants should review available geologic or geotechnical reports on local geology to identify relevant features such as depth to bedrock, rock type, lithology, faults, and hydrostratigraphic or confining units. These geologic investigations may also identify shallow water tables and past groundwater issues that are important for BMP design (see below).

Groundwater Considerations

Site groundwater conditions should be considered prior to Retention BMP, Biofiltration BMP, and Treatment Control Measure siting, selection, sizing, and design. The depth to groundwater beneath the project during the wet season may preclude infiltration, since five feet of separation to the seasonal high ground water level and mounded groundwater level is required. Depth to seasonal high groundwater level shall be estimated as the average of the annual minima (i.e., the shallowest recorded measurements in each water year, defined as October 1 through September 30) for all years on record. If groundwater level data are not available or not considered to be representative, seasonal high groundwater depth can be determined by redoximorphic analytical methods combined with temporary groundwater monitoring for November 1 through April 1 at the proposed project site.

In areas with known groundwater pollution, infiltration may need to be avoided, as it could contribute to the movement or dispersion of groundwater contamination. Areas with known groundwater impacts include sites listed by the Los Angeles Regional Water Quality Control Board's Leaking Underground Storage Tanks (LUST) program and Site Cleanup Program (SCP). The California State Water Resources Control Board maintains a database of registered contaminated sites through their '[Geotracker](#)' Program. Registered contaminated sites can be identified in the project vicinity when the site address is typed into the "map cleanup sites" field.

Mobilization of groundwater contaminants may also be of concern where contamination from natural sources is prevalent (e.g., marine sediments, selenium rich groundwater, to the extent that data is available). Infiltration on sites with contaminated soils or groundwater that could be mobilized or exacerbated by infiltration is not allowed, unless a site-specific analysis determines the infiltration would be beneficial. A site-specific analysis may be conducted where groundwater pollutant mobilization is a concern to allow for infiltration-based BMPs.

Research conducted on the effects of stormwater infiltration on groundwater by Pitt et al. (1994) indicate that the potential for contamination due to infiltration is dependent on a number of factors, including the local hydrogeology and the chemical characteristics of the pollutants of concern. Chemical characteristics that influence the potential for groundwater impacts include high mobility (low absorption potential), high solubility fractions, and abundance of pollutants in urban runoff. As a class of constituents, trace metals tend to adsorb onto soil particles and are filtered out by the soils. This has been confirmed by extensive data collected beneath stormwater detention/retention ponds in Fresno (conducted as part of the Nationwide Urban Runoff Program (Brown & Caldwell, 1984)) that showed that trace metals tended to be adsorbed in the upper few feet in the bottom sediments. Bacteria are also filtered out by soils. More mobile and soluble pollutants, such as chloride and nitrate, have a greater potential for impacting groundwater.

Where soils have very high infiltration rates, groundwater quality may be impacted by infiltration BMPs. Prior to the use of infiltration basins and subsurface infiltration BMPs in areas with high infiltration rates, consult with the local

regulatory agencies to identify if unconfined aquifers are located beneath the project to determine the appropriateness of infiltration-based BMPs. In areas underlain by unconfined aquifers with designated beneficial groundwater uses (e.g. drinking water supply), the application of infiltration BMPs should be limited to those that provide significant pretreatment to ensure groundwater is protected from pollutants of concern.

Geotechnical Considerations

Water infiltration can cause geotechnical issues, including: (1) settlement through collapsible soil, (2) expansive soil movement, (3) slope instability, and (4) increased liquefaction hazard. Stormwater infiltration temporarily raises the groundwater level near the infiltration facility, such that the potential geotechnical conditions are likely to be of greatest significance near the infiltration area and decrease with distance. A geotechnical investigation should be performed for the infiltration facility to identify potential geotechnical issues and geological hazards that may result from infiltration.

In general, infiltration-based BMPs must be set back from building foundations or steep slopes. Increased water pressure in soil pores reduces soil strength. Decreased soil strength can make foundations more susceptible to settlement and slopes more susceptible to failure. Recommendations for each site should be determined by a licensed geotechnical engineer based on soils boring data, drainage patterns, and the current requirements for stormwater treatment. Implementing the geotechnical engineer's requirements is essential to prevent damage from increased subsurface water pressure on surrounding properties, public infrastructure, sloped banks, and even mudslides.

Collapsible Soil

Typically, collapsible soil is observed in sediments that are loosely deposited, separated by coatings or particles of clay or carbonate, and subject to saturation. Stormwater infiltration will result in a temporary rise in the groundwater elevation. This rise in groundwater could change the soil structure by dissolving or deteriorating the intergranular contacts between the sand particles, resulting in a sudden collapse, referred to as hydrocollapse. This collapse phenomenon generally occurs during the first saturation episode after deposition of the soil, and repeated cycles of saturation are not likely to result in additional collapse. It is important to evaluate the potential for hydrocollapse during the geotechnical investigation.

The magnitude of hydrocollapse is proportional to the thickness of the soil column where infiltration is occurring. In most instances, the magnitude of hydrocollapse will be small. Regardless, the geotechnical engineer should evaluate the potential effects of hydrocollapse from large infiltration facilities on nearby structures and roadways. Typically, a network of surface settlement monuments is installed around the infiltration site, along adjacent roadways, and in neighboring developments to evaluate if hydrocollapse has occurred. These monuments are typically monitored

prior to infiltrating stormwater, monthly during the first year of operation of the facility, then yearly thereafter for a period of approximately five years.

Expansive Soil

Expansive soil is generally defined as soil or rock material that has a potential for shrinking or swelling under changing moisture conditions. Expansive soils contain clay minerals that expand in volume when water is introduced and shrink when the water is removed or the material is dried. When expansive soil is present near the ground surface, a rise in groundwater from infiltration activities can introduce moisture and cause these soils to swell. Conversely, as the groundwater surface falls after infiltration, these soils will shrink in response to the loss of moisture in the soil structure. The effects of expansive soil movement (swelling and shrinking) will be greatest on near surface structures such as shallow foundations, roadways, and concrete walks. Basements or below-grade parking structures can also be affected as additional loads are applied to the basement walls from the large swelling pressures generated by soil expansion. A geotechnical investigation should identify if expandable materials are present near the proposed infiltration facility, and if they are, evaluate if the infiltration will result in wetting of these materials. See Appendix B, Map B-14 (expansive soil potential map).

Slopes

Slopes near the infiltration facility can be affected by the temporary rise in groundwater. The presence of a water surface near a slope can substantially reduce the stability of the slope from a dry condition. A groundwater mounding analysis should be performed to evaluate the rise in groundwater around the facility. If the computed rise in groundwater approaches nearby slopes, then a separate slope stability evaluation should be performed to evaluate the implications of the temporary groundwater surface. The geotechnical and groundwater mounding evaluations should identify the duration of the elevated groundwater and assign factors of safety consistent with the duration (e.g., temporary or long-term conditions).

Liquefaction

Seismically-induced soil liquefaction is a phenomenon in which saturated granular materials, typically possessing low to medium density, undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground motions induced by earthquakes. This rearrangement and strength loss is followed by a reduction in bulk volume. Manifestation of soil liquefaction can include loss of bearing capacity for foundations, surface settlements, and tilting in level ground. Soil liquefaction can also result in instabilities and lateral spreading in embankments and areas of sloping ground.

Saturation of the subsurface soils above the existing groundwater table may occur as a result of stormwater infiltration. A groundwater mounding analysis should also

evaluate the duration of mounding, as a lengthy duration or long-term rise in groundwater will need to be considered in the evaluation of liquefaction. If the granular soils are sufficiently dense, it is unlikely that liquefaction will be of concern, regardless of the groundwater mounding. If analyses indicate that the potential for liquefaction may be increased from stormwater infiltration, then the analyses will need to evaluate the liquefaction-induced settlement of structures, lateral spreading, and other surface manifestations. See Appendix B, Map B-14 (liquefaction potential map).

Managing Offsite Drainage

Locations and sources of offsite run-on onto the site should be identified early in the design process. Offsite drainage should be considered when determining appropriate BMPs so that drainage can be managed. Concentrated flows from offsite drainage may cause extensive erosion, if not properly conveyed through or around the project site or otherwise managed. By identifying the locations and sources of offsite drainage, the volume of water running onto the site may be estimated and factored into the siting and sizing of onsite BMPs. Vegetated swales or storm drains may be used to intercept, divert, and convey offsite drainage through or around a site to prevent flooding or erosion that might otherwise occur.

Existing Utilities

Existing utility lines that are onsite will limit the possible locations of certain BMPs. For example, infiltration BMPs should not be located near utility lines where the increased amount of water could damage the utilities. Stormwater should be directed away from existing underground utilities. Project designs that require the relocation of existing utilities should be avoided, if possible.

Environmentally Sensitive Areas

The presence of Environmentally Sensitive Areas (ESAs) may limit the siting of certain BMPs. ESA's are typically delineated by and fall under the regulatory oversight of state or federal agencies such as the U.S. Army Corp of Engineers (USACE), California Department of Fish and Game, U.S. Fish and Wildlife Service, or the California Environmental Protection Agency. BMPs should be selected and sited to avoid adversely affecting an ESA. The Ventura County ESA map (ESA as defined in [Order R4-2010-0108](#)) is provided in Appendix B or may be obtained from the local permitting authority.

3.2 Technical Feasibility Screening

To use biofiltration BMPs and alternative compliance measures, the project applicant should demonstrate that compliance with the requirement to reduce EIA to $\leq 5\%$ using Retention BMPs is technically infeasible by submitting a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer and/or geologist. Projects seeking to use alternative compliance measures must demonstrate EIA has been reduced to the maximum

extent practicable. Project applicants should contact their local Approval Agency to determine if additional infeasibility criteria apply. Technical infeasibility may result from conditions including the following:

- 1) Locations where seasonal high groundwater or mounded groundwater beneath an infiltration BMP is within 5 feet of the bottom of the infiltration BMP.
- 2) Locations on the project site where soils are mapped with Ventura Hydrology Manual Soil Numbers 1-2 or site-specific analyses show that the soils have an infiltration rate less than 0.3 inches per hour. Locations where soils are mapped with Ventura Hydrology Manual Soil Number 3, or where a site-specific analyses show that the soils have an infiltration rate of 0.3 to 0.5 inches per hour, and no other infiltration-related infeasibility criteria apply, shall use a [Bioinfiltration BMP](#) or [Rainwater Harvesting](#) (if feasible) to achieve the 5% EIA requirement.
- 3) Locations on the project site within 100 feet of a groundwater well used for drinking water, non-potable wells, drain fields, and springs; locations less than 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project; and locations less than eight feet from building foundations or an alternative setback established by the geotechnical expert for the project.
- 4) Locations where pollutant mobilization is a documented concern, unless a site-specific analysis determines that infiltration would not be detrimental. Portions of brownfield development sites may be eligible for alternative compliance where pollutant mobilization is a concern.
- 5) Locations with potential geotechnical hazards established by the geotechnical professional for the project.
- 6) Projects with high-risk areas such as service/gas stations, truck stops, and heavy industrial sites, unless a site-specific evaluation demonstrates that:
 - Treatment is provided to address pollutants of concern, and/or
 - High risks areas are isolated from stormwater runoff or infiltration areas with little chance of spill migration.
- 7) Locations where reduction of surface runoff may potentially impair beneficial uses of the receiving water as documented in a site-specific study (e.g., California Environmental Quality Act (CEQA) analysis) or watershed plan.
- 8) Location where an increase in infiltration over natural conditions could potentially cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes, as confirmed through a site-specific study.

- 9) Green roofs are not required to be considered for all project locations and types; this evapotranspiration BMP is considered optional subject to the approval of the permitting authority.
- 10) Projects that do not provide sufficient demand for harvested stormwater such that the system provides 80% capture with a 72 hour drawdown time considering all “allowable and reliable demand.”
 - a. Allowable and reliable demand is defined as the rate of use of harvested water under average wet season conditions (November through March), from sources meeting the following criteria:
 - The use is permitted by building codes and health codes without requiring disinfection and fine filtration.
 - The use is reliable on a seasonal basis, such that the lowest weekly demand on an average annual basis is no less than 2/7th of the wet season average. *Intent: Under worst-case conditions, the demand should still be sufficient to use the entire tank volume within a week.*
 - Where a reliable use is present on the site that is not permitted by building codes and/or health codes, a variance has been sought to allow use without disinfection and fine filtration.
 - The use does not conflict with mandatory use of reclaimed water. It is assumed that uses do not conflict unless water balance calculations are provided to demonstrate the contrary.
 - The estimated use rates are consistent with requirements for low water use landscaping requirements under local and statewide ordinance (including California Assembly Bill 1881).
- 11) BMPs that are not allowable per current federal, state or local codes are considered infeasible. Local codes will be updated by mid-2012 as required in [Order R4-2010-0108](#) (Provision III.D).
- 12) The following project types where the density and/or nature of the project would create significant difficulty for compliance with the requirement to reduce EIA to ≤5%:
 - a. Redevelopment projects (as defined in [Section 1.5](#)).
 - b. Infill projects that meet the following conditions:
 - i. The project is consistent with applicable general plan designation, and all applicable general plan policies, and applicable zoning designation and regulations;

- ii. The proposed development occurs on a project site of no more than five acres substantially surrounded by urban uses;
 - iii. The project site has no value as habitat for endangered, rare, or threatened species;
 - iv. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and
 - v. The site can be adequately served by all required utilities and public services (modified from State Guidelines § 15332).
- c. Smart Growth projects, which are defined as new development and redevelopment projects that occur within existing urban areas (see maps in Appendix B) designed to achieve the majority of the following principles :
- i. Create a range of housing opportunities and choices;
 - ii. Create walkable neighborhoods;
 - iii. Mix land uses;
 - iv. Preserve open space, natural beauty, and critical areas;
 - 1. Farmland preservation may also be considered for projects occurring outside existing urban areas (as defined by the Appendix B maps).
 - v. Provide a variety of transportation choices;
 - vi. Includes transit oriented development (development located within an average 2,000 foot walk to a bus or train station).
 - vii. Strengthen and direct development towards existing communities (as defined by Appendix B maps); and
 - viii. Take advantage of compact building design.

The City or County Planning Division in which a project is proposed will ultimately determine whether a project meets these Smart Growth criteria.

13) Pedestrian/bike trail projects:

- ✓ Located along side of a road and
- ✓ Where right-of-way width is inadequate for the implementation of Retention and/or Biofiltration BMPs.

14) Agency flood control, drainage, and wet utilities projects:

- ✓ Located within waterbody and is therefore not increasing functional impervious cover; or
- ✓ Located on top of a narrow flood control feature (such as a levee) and space is unavailable for the implementation of Retention and/or Biofiltration BMPs; or
- ✓ Where the integrity of the flood control feature (such as a dam or levee) may be compromised through Retention and/or Biofiltration BMPs (e.g., infiltration of stormwater is not appropriate in a levee).

15) Historical preservation projects:

- ✓ Where the extent of the designated preservation area restricts the amount of land available for the implementation of Retention BMPs.

16) Low income housing projects that occur within existing urban areas (as defined by the maps provided in Appendix B):

- ✓ Where density requirements restrict the amount of land available for the implementation of Retention BMPs and/or
- ✓ Where project financing constraints restrict the amount of land available for the implementation of Retention BMPs.

Determining Maximum Volume Feasibly Infiltrated and/or Biofiltered

Site conditions and constraints may make it infeasible to fully retain stormwater to achieve $\leq 5\%$ EIA using Retention BMPs. In such cases, stormwater runoff must be retained to the maximum extent practicable and then the remaining volume must be multiplied by 1.5 and biofiltered to the maximum extent practicable. If SQDV still remains, it may be addressed in an alternative compliance program. This section provides narrative and numeric criteria for determining the “maximized” volume for Infiltration BMPs and Biofiltration BMPs. The term “maximized” refers to the volume that is determined, on a case-by-case basis, to be consistent with the maximum extent practicable standard.

Criteria for Maximizing Infiltration Volume

Volume can be considered to be maximized in infiltration BMPs when all of the following conditions are met, or when adjustments to the site/BMP plan to meet any one of these criteria results in achievement of the $\leq 5\%$ EIA performance standard:

- 1) BMPs are designed to the maximum depth allowed by design standards, but are not required to exceed the depth that infiltrates within 48 hours at the design percolation rate. *Explanation: Deeper BMPs provide more volume per footprint*

area, therefore it is more feasible to retain stormwater in deeper BMPs than shallower BMPs. However, because of the nature of sequential storms in Southern California, the volume provided in excess of that which drains within 48 hours provides significantly diminishing value.

- 2) All practicable methods are employed to enhance the design percolation rate, including:
 - Use of soil amendments to native soil below infiltration BMPs, and
 - Provision of pretreatment to reduce the allowable factor of safety, and
 - Additional site investigation to reduce uncertainty in infiltration rate and allow the use of a lower factor of safety.
- 3) Good site practices have been integrated to provide the maximum pervious area feasible for infiltration BMPs, and infiltration BMPs have been configured to make use of this area. Table 3-1 provides recommended percentages of a site, by project type, that should be feasible to dedicate to infiltration BMPs (where technically feasible) within pervious areas. If the project has not provided this portion of the project site for infiltration BMPs (where technically feasible), an attempt should be made to improve site design to provide more pervious area until it is either infeasible to provide more pervious area or EIA is reduced to $\leq 5\%$. The minimum percent of parking lot pavement area considered feasible to dedicate to permeable pavement (where technically feasible) is 20%; this does not apply to parking lots that anticipate heavy truck traffic such as truck stops and heavy industrial areas. The criteria provided in Table 3-1 are guidance; each project will be individually evaluated by the local permitting authority to determine if good site practices have been integrated into the project to provide the maximum pervious area feasible for siting infiltration BMPs.

Criteria for Maximizing Biofiltration Volume

Biofiltration BMPs can be used downstream of a Retention BMP that has been “maximized” (e.g., a planter box treating overflow from a cistern) or can be designed to provide both “maximized” retention and “maximized” biofiltration in the same BMP (e.g., a bioretention area with an underdrain, where retention volume is provided in a gravel layer or other subsurface reservoir below the underdrain).

Volume can be considered to be maximized in Biofiltration BMPs when all of the following conditions are met, or when adjustments to the site design and BMP plan to meet any one of these criteria results in achievement of the $\leq 5\%$ EIA performance standard:

- 1) Drain time and/or treatment rate of the Biofiltration BMP is consistent with design guidance contained in [Section 6](#) of the 2011 TGM.

- 2) Good site practices have been integrated to provide the maximum area feasible for Biofiltration BMPs, and BMPs have been configured to make use of this area. Table 3-1 provides recommended percentages of a site that are feasible to be dedicated to Biofiltration BMPs by project type. If the project has not provided these portions of the project site for siting Biofiltration BMPs, an attempt should be made to improve site design to provide more area until it is either infeasible to provide more area or EIA is reduced to $\leq 5\%$. The criteria provided in Table 3-1 are guidance; each project will be individually evaluated by the local permitting authority to determine if good site practices have been integrated into the project to provide the maximum pervious area feasible for siting Biofiltration BMPs.

If a Biofiltration BMP also includes a retention component (e.g., storage volume in a swale in amended soil below the surface discharge elevation or storage below the underdrain of a bioretention area), the maximized retention volume is determined as the volume of water that can be infiltrated or evapotranspired within 48 hours after the Biofiltration BMP has emptied. This criterion should be used to establish the depth of the retention layer (i.e., the depth of amended soil below the swale or the size of the storage below underdrains in the bioretention area).

Table 3-1: Recommended Criteria for Percent of Site Feasible to Dedicate to BMPs

Project Type		Percent of Site ¹
New Development	SF/MF Residential < 7 du/ac	10
	SF/MF Residential 7 – 18 du/ac	7
	SF/MF Residential > 18 du/ac	5
	Mixed Use, Commercial, Institutional/Industrial w/ FAR < 1.0	10
	Mixed Use, Commercial, Institutional/Industrial w/ FAR 1.0 – 2.0	7
	Mixed Use, Commercial, Institutional/Industrial w/ FAR > 2.0	5
	Podium (parking under > 75% of project)	3
	Projects with zoning allowing development to lot lines	2
	Transit Oriented Development	5
	Parking	5

Project Type		Percent of Site ¹
Redevelopment	SF/MF Residential < 7 du/ac	5
	SF/MF Residential 7 – 18 du/ac	4
	SF/MF Residential > 18 du/ac	3
	Mixed Use, Commercial, Institutional/Industrial w/ FAR < 1.0	5
	Mixed Use, Commercial, Institutional/Industrial w/ FAR 1.0 – 2.0	4
	Mixed Use, Commercial, Institutional/Industrial w/ FAR > 2.0	3
	Podium (parking under > 75% of project)	2
	Projects with zoning allowing development to lot lines	1
	Transit Oriented Development	3
	Projects in Historic Districts	3

Key: SF = Single Family, MF = Multi Family, du/ac = dwelling units per acre, FAR = Floor Area Ratio = ratio of gross floor area of building to gross lot area.

¹ If subsurface BMPs are used, dedicated area may have other surface land uses which do not structurally impact the subsurface BMP (see INF-6: Proprietary Infiltration).

3.3 Treatment Control Measure Selection Guidance

Treatment Control Measure selection criteria contained in [Order R4-2010-0108](#) include the following:

- Treatment Control Measures shall be selected based on the primary class of pollutants likely to be discharged from the project (e.g., metals from an auto repair shop).
- For projects that discharge to an impaired waterbody and whose discharges contain the pollutant causing impairment, the project shall select Treatment Control Measures from the top three performing BMP categories, or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP, for the pollutant causing impairment.

Primary Class of Pollutants

Pollutants in stormwater runoff are typically related to land use activities, which means that the proposed project’s site uses provide some indication of the pollutants that will be generated in the site’s runoff. Table 3-2 identifies pollutants of concern based on typical land use activities that may be present on a project site.

Table 3-2: Land Uses and Associated Pollutants

Class of Pollutant	Potential Land Use and Activities Sources
Sediment (TSS and Turbidity)	Streets, driveways, roads, landscaped areas, construction activities, soil erosion (channels and slopes)
Nutrients	Landscape fertilizers, atmospheric deposition, automobile exhaust, soil erosion, animal waste, detergents
Metals/Metalloids	Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, metal surfaces, combustion processes
Pesticides	Landscaped areas, roadsides, utility right-of-ways
Organic Materials/ Oxygen Demanding Substances	Landscaped areas, animal wastes, industrial wastes
Oil and Grease/ Organics Associated with Petroleum	Roads, driveways, parking lots, vehicle maintenance areas, gas stations, automobile emissions, restaurants
Bacteria and Viruses	Lawns, roads, leaky sanitary sewer lines, sanitary sewer cross-connections, animal waste (domestic and wild), septic systems, homeless encampments, sediments/biofilms in stormwater conveyance system
Trash and Debris (Gross Solids and Floatables)	Commercial areas, roadways, schools, trash receptacles/storage/disposal

Adapted from US EPA, 1999 (Preliminary Data Summary of Urban Stormwater BMPs)

Impaired Waterbodies

When designated beneficial uses of a particular receiving water body are being compromised by water quality for a specific or multiple pollutants, Section 303(d) of the CWA requires identifying and listing that water body as “impaired”.

Table 3-3 below lists the categories of pollutants and specific pollutants that are included on the 2010 303(d) list for Ventura County. Project proponents should consult the most recent 303(d) list to identify whether the project’s receiving waterbody is listed as impaired. The most recent 303(d) list is located on the [State Water Resources Control Board](#) website (click on water issues/programs/water quality assessment).

Table 3-3: Ventura County 2010 303(d)-listed Water Quality Pollutants

Class of Pollutant	Specific Pollutants		
Sediment (TSS and Turbidity)	Sedimentation/Siltation		
Nutrients	Ammonia Nitrate and Nitrite Nitrate Nitrogen	Organic Enrichment/ Low Dissolved Oxygen	Algae Eutrophic
Metals/Metalloids	Boron Copper Copper, Dissolved	Lead Mercury Nickel	Selenium Zinc
Pesticides	ChemA (tissue) Chlordane Chlordane (tissue & sediment) Chlordane (tissue) Chlorpyrifos Chlorpyrifos (tissue) DDT DDT (sediment) DDT (tissue & sediment)	DDT (tissue) Diazinon Dieldrin Dieldrin (tissue) Organophosphorous Pesticides Toxaphene Toxaphene (tissue & sediment) Toxaphene (tissue)	
Trash and Debris (Gross Solids and Floatables)	Trash and Debris		
Other Organics	PCBs		
Bacteria and Viruses	Coliform Bacteria	Indicator Bacteria	
Salinity	Chloride		
Toxicity	Sediment Toxicity	Toxicity	
Miscellaneous	pH	Scum/Foam - unnatural	Sulfates

Once the classes of pollutants likely to be discharged from the project have been identified for projects that do not discharge to an impaired waterbody, any Treatment Control Measures listed in Table 3-4 that addresses the primary pollutant class may be selected. If more than one pollutant class is identified, then sediment shall be the primary pollutant class.

For projects that discharge to an impaired waterbody and whose discharges contain the pollutant causing impairment, the project shall select Treatment Control Measures from the top three BMPs listed for that class of pollutant in Table 3-4, or alternative BMPs that are designed to meet or exceed the performance of the highest performing Treatment Control Measure, for the pollutant causing impairment. Many receiving water impairments are due to legacy pollutants from past land use activities (e.g., DDT from historical farming or PCBs from historical industrial activities), where the primary sources are contaminated soils and sediment. For these pollutants, site clean-up, erosion and sediment controls during construction, slope

stabilization measures, and placement of impervious surfaces will address the legacy pollutants.

Table 3-4: Treatment Control Measures for Addressing Pollutants of Concern

Class of Pollutant	Recommended BMPs (in Order of Performance)
Sediment	<ol style="list-style-type: none"> 1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): <ol style="list-style-type: none"> a. Biofiltration BMPs b. Wet Detention Basin c. Constructed Wetland d. Sand Filter/Cartridge Media Filter 3. Dry Extended Detention Basin
Metals / Metalloids	<ol style="list-style-type: none"> 1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): <ol style="list-style-type: none"> a. Constructed Wetland b. Biofiltration BMPs c. Wet Detention Basin d. Sand Filter/Cartridge Media Filter 3. Dry Extended Detention Basin
Nutrients ¹	<ol style="list-style-type: none"> 1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): <ol style="list-style-type: none"> a. Bioinfiltration b. Wet Detention Basin c. Constructed Wetland 3. Any of the following BMPs (equivalent performance): <ol style="list-style-type: none"> a. Biofiltration BMPs 4. Any of the following (equivalent performance): <ol style="list-style-type: none"> a. Sand Filter/Cartridge Media Filter b. Dry Extended Detention Basin
Pesticides ²	<ol style="list-style-type: none"> 1. Source controls, erosion controls 2. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 3. Any of the following BMPs (equivalent performance): <ol style="list-style-type: none"> a. Biofiltration BMPs b. Wet Detention Basin c. Constructed Wetland d. Sand Filter/Cartridge Media Filter 4. Dry Extended Detention Basin

Class of Pollutant	Recommended BMPs (in Order of Performance)
Pathogens	<ol style="list-style-type: none"> 1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): <ol style="list-style-type: none"> a. Bioretention with Underdrain b. Wet Detention Basins c. Proprietary Biofiltration 3. Sand Filter/Cartridge Media Filter
Trash and Debris	<ol style="list-style-type: none"> 1. Gross Solids Removal BMPs (should be combined with a Retention BMP, Biofiltration BMP, or Treatment Control Measure) 2. Any Retention BMP, Biofiltration BMP, or Treatment Control Measure designed to incorporate a trash capture device (e.g., a trash screen)

¹Performance is based on removal of nitrogen compounds. For performance of BMPs in removing phosphorous, see sediment pollutant class as they are largely associated with particulates.

²Performance data is not available for this pollutant class, but as they are largely associated with particulates, BMP selection should be similar to the sediment pollutant class.

An analysis of Biofiltration BMP and Treatment Control Measure performance from the ASCE International Stormwater BMP Database [1999-2008] is provided in Appendix D. These performance data summaries are occasionally revised. Updated analyses of Biofiltration BMP and Treatment Control Measure performance may be found on the [ASCE International Stormwater BMP Database website](#). The 2011 TGM assumes that BMPs adhering to the design guidance provided in [Section 6](#) will have a level of pollutant removal performance comparable to those listed in Attachment C in [Order R4-2010-0108](#) (also provided in Appendix D.1).

Proprietary BMPs should meet or exceed the performance standards listed in Attachment C in [Order R4-2010-0108](#) and provided in Appendix D.

The data contained in the Stormwater BMP Database indicate that wet detention basins, constructed wetlands, sand filters, and biofilters are among the best performing BMPs for the typical pollutants of concern in urban runoff. This conclusion is consistent with the treatment processes typically provided by these BMP types (e.g., filtration, sedimentation, adsorption, and biological processes).

Wet detention basins (wetponds) and constructed wetlands are attractive solutions both from a treatment process and observed performance perspective. However, these systems require significant base flow to maintain their permanent pools and to avoid creating stagnant conditions and vector concerns. Therefore, these BMPs are often infeasible in locations where water conservation during dry weather is a significant concern. If a regional Treatment Control Measure is desired, infiltration basins and dry extended detention basins may be more feasible in Ventura County. However, these BMPs may need additional treatment train components (e.g., pre- or post-treatment) to adequately address the entire list of pollutants of concern and provide reliable and consistent performance, in addition to significant space

requirements. BMP designs for each pollutant category that incorporate dense vegetation and promote extended contact with or filtration through soils are encouraged, consistent with the BMP selection prioritization requirements in [Order R4-2010-0108](#).

Consideration of Site-Specific Conditions

Ultimately, Retention BMPs, Biofiltration BMPs, and Treatment Control Measures have to be constructed at a physical location and site-specific conditions should be considered during the BMP selection process. Site constraints such as steep slopes, poor draining soils, high ground water tables, unstable or contaminated soils and several other factors can preclude the implementation of certain kinds of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures or design options. Therefore, site-specific conditions must be considered when selecting specific BMPs or Treatment Control Measures to implement. Once candidate BMPs or Treatment Control Measures have been chosen, the selection process should consider the site assessment results for soil characteristics, slopes, groundwater proximity, etc. Table 3-5 below provides general guidance for designers regarding site limitations for the different Retention BMPs, Biofiltration BMPs, and Treatment Control Measures.

Table 3-6 below provides general guidance for designers regarding capital and operation costs for the different Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. BMP costs can also be estimated using the Water Environment Research Foundation (WERF) BMP and LID Whole Life Cost Models. These models are set of spreadsheet tools that help users identify and combine capital costs and ongoing maintenance expenditures in order to estimate whole life costs for stormwater management. The models provide a framework for calculating capital and long-term maintenance costs of individual Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Models are included for retention ponds, extended detention basins, vegetated swales, permeable pavement, green roofs, large commercial cisterns, and bioretention. Online PDF of user's guide and spreadsheet tools are located here: http://www.werf.org/AM/Template.cfm?Section=Research_Profile&Template=/CustomSource/Research/PublicationProfile.cfm&id=SW2Ro8.

Table 3-5: BMP Site Suitability Considerations

Important Note to Users: This table should be used to provide general BMP comparisons only and should not replace an evaluation performed by a qualified water quality professional.

BMP	Site Suitability Considerations			
	Tributary Area (Acres) ¹	Site Slope (%)	Depth to Seasonally High or Mounded Groundwater (ft)	Soil Number
Infiltration BMPs: INF-1: Infiltration Basin INF-2: Infiltration Trench INF-3: Bioretention INF-4: Drywell INF-6: Proprietary Infiltration	< 5	< 7 ²	> 5	Not suitable in Soil Numbers 1, 2, and 3 unless percolation testing shows the infiltration rate is greater than 0.5 in/hr
INF-5: Permeable Pavement	< 5	< 5 ^{2,5}	> 2 with underdrains; > 5 without underdrains	Underdrains should be provided for Soil Numbers 1, 2, and 3
ET-1: Green Roof	Equal to roof tributary area	N/A	N/A	N/A
BIO-1: Bioretention with Underdrain	< 5	< 15; planter boxes are generally more suitable for steep slopes ^{2,3}	> 2 with underdrains; > 5 without underdrains	Underdrains should be provided for Soil Numbers 1, 2, and 3
BIO-2: Planter Box	< 1	< 15 ⁴	> 2	Any
BIO-3: Vegetated Swale	< 5	< 10 site slope; 0.5 to 6 longitudinal slope of swale ^{2,3}	> 2 with underdrains; > 5 without underdrains	Any ³

BMP	Site Suitability Considerations			
	Tributary Area (Acres) ¹	Site Slope (%)	Depth to Seasonally High or Mounded Groundwater (ft)	Soil Number
BIO-4: Vegetated Filter Strip	< 2	< 4 site slope; 2 to 6 longitudinal slope of strip ²	> 2	Any
BIO-5: Proprietary Biotreatment Devices	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
TCM-4: Sand Filter	< 10	< 15 ⁴	> 2	Any
TCM-5: Cartridge Media Filters	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
PT-1: Hydrodynamic Devices	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
PT-2: Catch Basin Inserts				

¹ Tributary area is the area of the site draining to the BMP. Tributary areas provided here should be used as a general guideline only. Tributary areas can be larger or smaller as appropriate.

² If site slope exceeds that specified or if the system is within 200 ft from the top of a hazardous slope or landslide area (on the uphill side), a geotechnical investigation analysis and report addressing slope stability shall be prepared by a licensed civil engineer. In addition, for swales, if the longitudinal slope exceeds 6%, check dams should be provided.

³ If system is located within 50 feet of a sensitive steep slope (on the uphill side), within 10 feet from a structure, has a longitudinal slope less than 1.5% (swales), or has poorly drained soils (e.g., silts and clays), underdrains should be incorporated.

⁴ If system is fully contained, includes an underdrain system, and overflows to a stormwater conveyance system, then slopes can exceed 15%.

⁵ If a gravel base is used for storage of runoff: (1) slopes should be restricted to 0.5% (steeper grades reduce storage capacity) and (2) underdrains should be used if within 50 feet of a sensitive steep slope.

⁶ Setbacks apply to systems without underdrains.

Table 3-6: BMP Cost Considerations

BMP Type	Relative Expense ⁴ (cost/ac-ft ¹ or cost/cfs ²)	Construction Costs (per cubic feet) ^{3,4}	Typical Cost ³		Annual Maintenance Cost (% of Construction) ^{3,4}	Notes
			(\$/BMP)	Application		
Infiltration Trench	Not included	\$4- \$50	\$45,000	5-ac Commercial Site (65% Impervious)	5%-20%	
Infiltration Basin	\$	\$1.30 - \$18	\$15,000	5-ac Commercial Site (65% Impervious)	1% -10%	
Bioretention	Not included	\$3- \$5.30	\$60,000	5-ac Commercial Site (65% Impervious)	5%- 7%	Cost of plants varies. Maintenance costs comparable to cost of typical landscaping.
Swale	\$\$	\$0.25-\$0.50	\$3,500	5-ac Residential Site (35% Impervious)	5%- 7%	
Filter Strip	\$\$	\$0.00- \$1.30	\$0- \$9,000	5-ac Residential Site (35% Impervious)	\$350/ acre/ year (about \$0.01/square foot/ year)	
Extended Detention Basin	\$\$\$	\$0.50- \$1.00	Not included		3 to 6%	Costs vary widely. One 0.3 ac-ft basin was recorded to have cost \$160,000 ⁵ \$3,132 Annual maintenance costs for per Caltrans ⁵
Wet Ponds	\$\$\$	\$0.50- \$1.00	Not included		3 to 6%	\$17,000 Annual maintenance costs for one Caltrans pond ⁵
Constructed Wetland	\$\$\$\$	\$0.60 – \$1.25	\$125,000	50-Acre Residential Site (35% Impervious)	2%	
Sand Filter	\$\$\$\$	\$3 - \$6	\$35,000- \$70,000	5-Acre Commercial Site (65% Impervious)		

¹ Volume based BMPs

² Flow based BMPs

³ EPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. Part D, Cost and Benefits Analysis. <http://water.epa.gov/scitech/wastetech/guide/stormwater/index.cfm#report>

⁴ CASQA, 2003. New Development and Redevelopment Handbook

⁵ Figures from Caltrans studies cited in CASQA BMP Handbook.

4 SITE DESIGN PRINCIPLES AND TECHNIQUES

4.1 Introduction

The primary objective of the Site Design Principles and Techniques is to reduce the hydrologic and water quality impacts associated with land development. The benefits derived from this approach include:

- Reduced size of downstream Treatment Control Measures and conveyance systems;
- Reduced pollutant loading to onsite Treatment Control Measures and receiving streams; and
- Reduced hydraulic impact on receiving streams.

Site Design Principles and Techniques include the following design features and considerations:

- Site planning;
- Protect and restore natural areas;
- Minimize land disturbance;
- Minimize impervious cover;
- Apply Low Impact Development best management practices (LID BMPs) at various scales; and
- Implement Integrated Water Resource Management Practices.

The Site Design Principles and Techniques described in this section are required to be considered for all new development and redevelopment projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures (as defined in Section 1.5). They are not required if the project proponent demonstrates to the satisfaction of the City or County that the particular measures are not applicable to the proposed project, or the project site conditions make it infeasible to implement the site design control measure in question. The applicability of specific controls outlined within this section should be confirmed with the local government.

Detailed descriptions and design criteria for each of the Site Design Principles and Techniques are presented in the following section.

4.2 Site Planning

Purpose

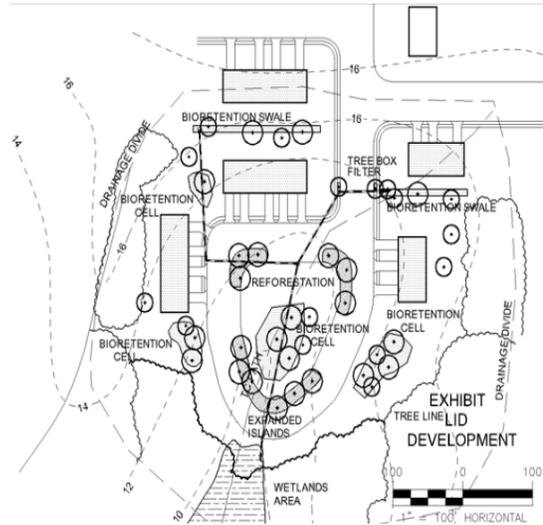
LID requires a holistic approach to site design and stormwater management. As such, planners, developers, architects, and engineers should reconsider conventional approaches to stormwater management. The use of site planning techniques presented here will generate a more hydrologically functional site, help to maximize the effectiveness of Retention BMPs, and integrate stormwater management

throughout the site.

Design Criteria

The following criteria should be considered during the early site planning stages:

- 1) Retention BMPs should be considered as early as possible in the site planning process. Hydrology should be an organizing principle that is integrated into the initial site assessment planning phases.
- 2) Project applicants should anticipate and plan for the space requirements of Retention and Biofiltration BMPs. Table 4-1 provides general rules of thumb for BMP space requirements.
- 3) Site planning should use a multidisciplinary approach that includes planners, engineers, landscape architects, and architects at the initial phases of the project.
- 4) Individual Retention BMPs should be distributed throughout the project site and may influence the configuration of roads, buildings, and other infrastructure.
- 5) The project must demonstrate disconnection of impervious surface such that the 5% EIA requirement is achieved. If fully meeting the 5% EIA requirement using Retention BMPs is not technically feasible, the project must still utilize Retention BMPs to the maximum extent practicable.
- 6) Consider flood control early in the design stages. Even sites with Retention BMPs will still have runoff that occurs during large storm events. Look for opportunities to simultaneously address flood control requirements and the requirement to reduce EIA to $\leq 5\%$ presented in Section 2.



LID BMPs Integrated within Site Planning Process

Low Impact Development Center, Inc.

- 7) Consider the use of alternative building materials instead of conventional materials for new construction and renovation. Several studies have indicated that metal used as roofing material, flashing, or gutters can leach metals into the environment. Avoid the use of roofing, gutters, and trim made of copper and galvanized (zinc) roofs, gutters, chain link fences and siding.
- 8) Consider [2010 Green Building Code](#) requirements during the site planning stages.

Table 4-1: Rule of Thumb Space Requirements for BMPs⁵

BMP Type	% of Contributing Drainage Area
Infiltration	3 to 10
Rainwater Harvesting (Cistern)	0 to 10
Evapotranspiration (Green Roof)	1 to 1 ratio of impervious cover treated
Biofiltration	3 to 5
Dry Extended Detention Basin	1 to 3
Wet Detention Basin	1 to 3
Sand Filters	0 to 5
Cartridge Media Filter	0 to 5

⁵ Modified from Schueler, T., D. Hirschman, M. Novotney, and J. Zielinski. 2007. Urban Stormwater Retrofit Practices. Manual 3 in the Urban Subwatershed Restoration Manual Series. Center for Watershed Protection. Ellicott City, MD.

4.3 Protect and Restore Natural Areas

Purpose

Each project site possesses unique topographic, hydrologic and vegetative features, some of which are more suitable for development than others. Sensitive areas that should be protected and/or restored include streams and their buffers, floodplains, wetlands, steep slopes, and high permeability soils. Additionally, slopes can be a major source of sediment and should be properly protected and stabilized.

Locating development on the least sensitive portion of a site and conserving naturally vegetated areas can minimize environmental impacts in general and stormwater runoff impacts in particular.



Stream Buffer

Larry Walker Associates

Design Criteria

If applicable and feasible for the given site conditions, the following site design features or elements are required and should be included in the project site layout, consistent with applicable General Plan and Local Area Plan policies:

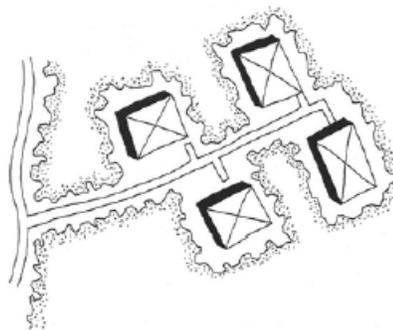
- 1) Identify and cordon off streams and their buffers, floodplains, wetlands, and steep slopes.
- 2) Reserve areas with high permeability soils for either open space or Infiltration BMPs.
- 3) Incorporate existing trees into site layout.
- 4) Identify areas that may be restored or revegetated either during or post-construction.
- 5) Identify and avoid and/or stabilize areas susceptible to erosion and sediment loss.
- 6) Concentrate or cluster development on the least-sensitive portions of a site, while leaving the remaining land in a natural undisturbed state.
- 7) Slopes must be protected from erosion by safely conveying runoff from the tops of slopes.
 - Slopes should be vegetated by first considering use of native or drought-tolerant species.

- Slope protection practices must conform to local permitting agency erosion and sediment control standards and design standards. The design criteria described in this section are intended to enhance and be consistent with these local standards.
- 8) Limit clearing and grading of native vegetation at the project site to the minimum amount needed to build lots, allow access, and provide fire protection.
 - 9) Maintain existing topography and existing drainage divides to encourage dispersed flow.
 - 10) Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought-tolerant plants.
 - 11) Promote natural vegetation by using parking lot islands and other landscaped areas. Integrate vegetated BMPs within parking lot islands and landscaped areas.

4.4 Minimize Land Disturbance

Purpose

This control works to protect water quality by preserving some of the natural hydrologic function of the site. By designing a site layout to preserve the natural hydrology and drainageways on the site, it reduces the need for grading the disturbance of vegetation and soils (GSMM, 2001). By siting buildings and impervious surfaces away from steep slopes, drainageways, and floodplains, it limits the amount of grading, clearing and distance and reduces the hydrologic impact. This site design principle has most applicability in greenfield settings, but opportunities may exist in redevelopment and infill projects.



Minimized Clearing and Grading

Greenfield et al., 1991

Existing soils may contain organic material and soil biota that are ideal for storing and infiltrating stormwater. Clearing, grading, and heavy equipment can remove and compact existing soils and, therefore, limit their infiltrative capacity. The design criteria presented below are not intended to supersede compaction requirements associated with building codes.

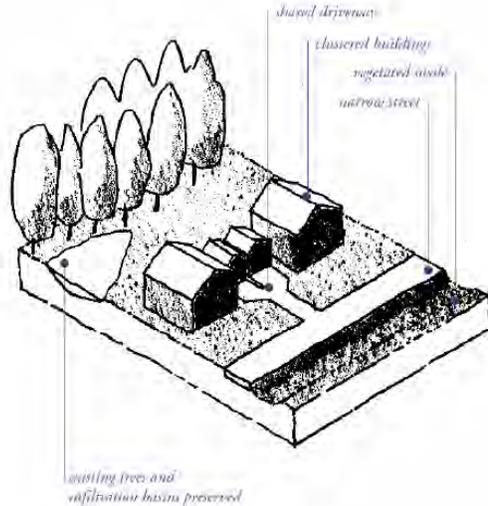
Design Criteria

- 1) Delineate and flag the development envelope for the site. Delineating and flagging the development envelope includes a clear indication of the development envelope on the site plan and physical demarcation in the field which can be accomplished using temporary orange construction fencing or flagging. The development envelope can be established by identifying the minimum area needed to build lots; allow access and provide fire protection; and protect and buffer sensitive features such as streams, floodplains, steep slopes and wetlands. Concentrate buildings and paved areas on the least permeable soils, with the least intact habitats.
- 2) Plan clearing and grading to minimize the compaction of infiltrative soils.
- 3) Restrict equipment access and storage of construction equipment to the development envelope.
- 4) Restrict storage of construction equipment within the development envelope.
- 5) Avoid the removal of existing trees and valuable vegetation, as feasible.
- 6) Consider soil amendments to restore permeability and organic content especially for infill and redevelopment projects to avoid soil disturbance.

4.5 Minimize Impervious Cover

Purpose

The potential for the discharge of pollutants in stormwater runoff from a project site increases as the percentage of impervious area within the project site increases because impervious areas increase the volume and rate of runoff flow. Pollutants deposited on impervious areas tend to be easily mobilized and transported by surface water runoff. Minimizing impervious area through site design is an important means of minimizing stormwater pollutants of concern. In addition to the environmental and aesthetic benefits, a highly pervious site may allow reduction in the size of downstream conveyance and treatment systems, yielding savings in development costs. Reducing impervious area is the most cost effective way of minimizing the effective impervious area (EIA) requirement.



Impervious Cover Minimization

BASMAA, Start at the Source

Design Criteria

Local permitting agency building and fire codes and ordinances determine some aspects of site design. These design strategies are intended to enhance and be consistent with these local codes and ordinances. Minimizing impervious surfaces at every possible opportunity requires integration of many small strategies. Suggested strategies for minimizing impervious surfaces through site design include the following:

- 1) Use minimum allowable roadway cross sections, driveway lengths, and parking stall widths and lengths.
- 2) Minimize or eliminate the use of curbs and gutters, and maximize the use of Retention BMPs, where slope and density permit.
- 3) Use two-track/ribbon alleyways/driveways or shared driveways.
- 4) Include landscape islands in cul-de-sac streets. Consider alternatives to cul-de-sacs to increase connectivity.
- 5) Reduce the footprints of building and parking lots. Building footprints may be reduced by building taller.
- 6) Use [permeable pavement](#) to accommodate overflow parking (if overflow parking is needed).

- 7) Cluster buildings and paved areas to maximize pervious area.
- 8) Maximize tree preservation or tree planting.
- 9) Avoid compacting or paving over soils with high infiltration rates (see [Minimize Land Disturbance](#)).
- 10) Use [pervious pavement](#) materials where appropriate, such as modular paving blocks, turf blocks, porous concrete and asphalt, brick, and gravel or cobbles.
- 11) Use grass-lined channels or surface swales to convey runoff instead of paved gutters (see [Vegetated Swale in Section 6](#)).
- 12) Build more compactly in infill and redevelopment site to avoid disturbing natural and agricultural lands. Per capita impacts can be significantly reduced by building more compactly in infill and redevelopment areas.

4.6 Apply LID at Various Scales

Purpose

LID is a decentralized approach to stormwater management that works to mimic the natural hydrology of the site by retaining rainfall onsite. In order to realize the full benefits of water quality protection and runoff volume reduction, LID should be integrated and considered at the regional and watershed scale and the site scale.

Design Criteria

Regional/Watershed

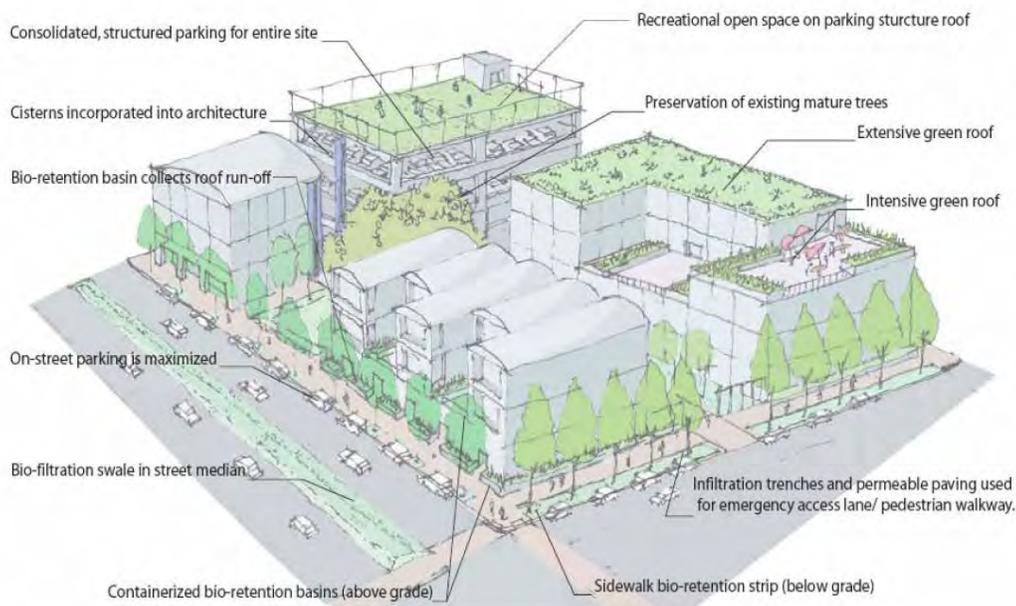
- 1) Consider Density: Low density development has a greater water resource impact than compact growth on a watershed scale. Higher density development uses less land and produces less impervious cover per capita than low density development (USEPA, 2006). Developments should consider higher densities, but should still adhere to density levels as specified within local zoning requirements.
- 2) Identify and Preserve Contiguous Open Space: Large contiguous areas of open space can act as a flood control, have an ecological benefit, serve as a buffer for streams and rivers, and provide recreational opportunities (EPA, 2004). Applicants should look for opportunities to link open space preservation with regional open space preservation efforts (such as [Save Open Space and Agricultural Resources](#)).
- 3) Make use of Previously Developed Sites: Redevelopment of existing sites replace impervious cover with impervious cover, reduces the need for greenfield development, and makes use of existing infrastructure.
- 4) Locate Compact Development within Close Proximity to Mass Transit: This maximizes transportation choices, reduces the number of automobile trips, and lessens the water quality impacts associated with transportation and low-density sprawl.

Site

The following design criteria should be considered at the site level in addition to the principles and techniques discussed earlier in this section (e.g., [Minimize Impervious Cover](#)).

- 1) Maintain and Restore Natural Flowpaths for Runoff: Site buildings and impervious surfaces away from steep slopes, drainageways, and floodplains to reduce the amount of necessary clearing and grading and maintain the pre-development hydrology's time of concentration.

- 2) Maximize Use of Existing Impervious Cover: Assess and take advantage of opportunities to use existing impervious surfaces at the site level to reduce runoff at a watershed scale.



LID BMPs Considered at Various Scales

C. Anderson, Sustainable Urbanism

- 3) Design Public Spaces and Common Areas to Minimize Stormwater Runoff: Public spaces and common areas can serve as community gathering places but are often composed of impervious cover (e.g., courtyards primarily made up of concrete) (EPA, 2004). Design public spaces and common areas to accommodate both people and stormwater management.
- 4) Compact Project Design: Compact project design reduces the amount of impervious cover per capita, increases walkability, and decreases water quality impacts associated with transportation. Concentrating development on one portion of the site reduces the amount of lawn, provides more opportunities to preserve open space, and maintains and restores natural flow paths. Additionally, compact design can reduce street and driveway length and as a result, can help to reduce the imperviousness associated with development.
- 5) Encourage Use of Multiple Modes of Transportation: In addition to density and compact design, additional aspects of site design may encourage the use of multiple modes of transportation:
- Bicycle and pedestrian-friendly streets;
 - Well connected sidewalks and streets; and
 - Mixed uses that encourage walking.

4.7 Implement Integrated Water Resource Management Practices

Purpose

Integrated Water Resource Management (IWRM) is a process which promotes the coordinated development and management of water, land, and related resources. [Order R4-2010-0108](#) promotes the use of IWRM to help guide the selection of BMPs that conserve water, recharge groundwater, provide recreational opportunities and serve as multiple purpose parks and preserve open space.

Many of the concepts of IWRM are documented in the County's Integrated Regional Water Management Plan (IRWMP). The IRWMP is the product of an intensive stakeholder process and addresses multiple water resource management goals including improved water supply reliability, water recycling, water conservation, recreation and access, flood control, wetlands enhancement and creation, and environmental and habitat protection (Watershed Coalition of Ventura County, 2006).



**Integrated Regional Water
Management Plan**
Ventura County

Design Criteria

The [goals of the 2011 TGM](#) and the new development and redevelopment requirements contained within [Order R4-2010-0108](#), complement the goals of the IRWMP. Development projects should strive to select BMPs that meet the following multiple objectives (Watershed Coalition of Ventura County, 2006):

- 1) Conserve and Augment Water Supplies: Identify and evaluate the opportunities to recharge groundwater and increase water use efficiency. This can be accomplished through infiltration of stormwater runoff and selection of drought-tolerant landscaping.
- 2) Protect People, Property and the Environment from Adverse Flooding Impacts: Identify opportunities to utilize BMPs that provide both water quality and water quantity benefits. Provide and maintain setbacks from streams and rivers.
- 3) Protect and Restore Habitat and Ecosystems in Watersheds: Implement the practices identified in [Protect and Restore Natural Areas](#) to integrate habitat and stormwater goals. Landscaping selection for stormwater management practices may also further encourage and attract wildlife.

- 4) Provide Water-related Recreational, Public Access and Educational Opportunities: Integrate recreation and stormwater management by creating multi-functional BMPs and designing courtyards and open spaces that accommodate both people and stormwater runoff. Consider providing educational signs for BMPs located in public spaces, where appropriate.

5 SOURCE CONTROL MEASURES

5.1 Introduction

Source Control Measures are low-technology practices designed to prevent pollutants from contacting stormwater runoff and prevent discharge of contaminated runoff to the storm drainage system. This section addresses site-specific, structural-type Source Control Measures consisting of specific design features or elements. Non-structural type Source Control Measures; such as good housekeeping and employee training, are not included in the 2011 TGM. The project applicant can consult the California Industrial Best Management Practice Manual for this type of practice (SWQTF, 1993). The governing stormwater agency may require additional Source Control Measures not included in the 2011 TGM for specific pollutants, activities, or land uses.

This section describes control measures for specific types of sites or activities that have been identified as potential significant sources of pollutants in stormwater. Each of the measures specified in this section should be implemented in conjunction with appropriate non-structural Source Control Measures to optimize pollution prevention.

The measures addressed in this section apply to both stormwater and non-stormwater discharges. Non-stormwater discharges are the discharge of any substance, such as process wastewater, to the storm drainage system or water body that is not composed entirely of stormwater. Stormwater that is mixed or commingled with other non-stormwater flows is considered non-stormwater. Discharges of stormwater and non-stormwater to the storm drainage system or a water body may be subject to local, state, or federal permitting prior to discharge. The appropriate agency should be contacted prior to any discharge. Discuss the matter with the stormwater staff if you are uncertain as to which agency should be contacted.

Some of the measures presented in this section require connection to the sanitary sewer system. It is prohibited to connect and discharge to the sanitary sewer system without prior approval or obtaining the required permits. Contact the stormwater staff of the governing agency about obtaining sanitary sewer permits within Ventura County. Discharges of certain types of flows to the sanitary sewer system may be cost prohibitive. The designer is urged to contact the appropriate agency prior to completing site and equipment design of the facility.

5.2 Description

Table 5-1 summarizes site-specific Source Control Measures and associated design features specified for various sites and activities. Fact Sheets are presented in this section for each source control measure. These sheets include design criteria

established by the Approval Agencies to ensure effective implementation of the required Source Control Measures:

Table 5-1: Summary of Site-Specific Source Control Measure Design Features

Site-Specific Source Control Measure ¹	DESIGN FEATURE OR ELEMENT						
	Signs, placards, stencils	Surfacing (compatible, impervious)	Covers, screens	Grading/berming to prevent run-on	Grading/berming to provide secondary containment	Sanitary sewer connection	Emergency Storm Drain Seal
Storm Drain Message and Signage (S-1)	X						
Outdoor Material Storage Area Design (S-2)		X	X	X	X		X
Outdoor Trash Storage and Waste Handling Area Design (S-3)		X	X	X		X	
Outdoor Loading/Unloading Dock Area Design (S-4)		X	X	X	X		
Outdoor Repair/Maintenance Bay Design (S-5)		X	X	X	X		X
Outdoor Vehicle/Equipment/Accessory Washing Area Design (S-6)		X	X	X	X	X	X
Fueling Area Design (S-7)		X	X	X	X		X
Parking Lot Design ²							

1 Refer to Fact Sheets in Section 6 for detailed information and design criteria and Appendix E for BMP sizing worksheets

2 Requirements for proper design of parking lots are covered by requirements for General Site Design Principles and Techniques (see Section 4) and Treatment Control Measures (see Section 6).

5.3 Site-Specific Source Control Measures

S-1: Storm Drain Message and Signage

Purpose

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. This Fact Sheet contains details on the installation of storm drain messages at storm drain inlets located in new or redeveloped commercial, industrial, and residential sites.

Design Criteria

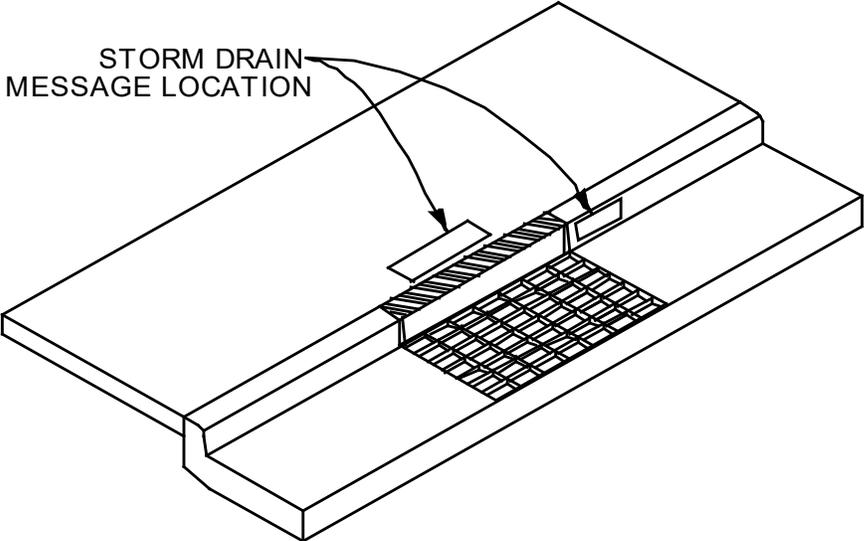
Storm drain messages have become a popular method of alerting the public to the effects of and the prohibitions against waste disposal into the storm drain system. The signs are typically stenciled or affixed near the storm drain inlet. The message simply informs the public that dumping of wastes into storm drain inlets is prohibited and/or the drain discharges to a receiving water.

Storm drain message markers or placards are required at all storm drain inlets within the boundary of the development project. The marker should be placed in clear sight facing anyone approaching the inlet from either side (see Figure 5-1). All storm drain inlet locations must be identified on the development site map.

Some local agencies within the County have approved storm drain message placards for use. Signs with language and/or graphical icons, which prohibit illegal dumping, should be posted at designated public access points along channels and streams within a project area. Consult local permitting agency stormwater staff to determine specific requirements for placard types and installation methods.

Maintenance Requirements

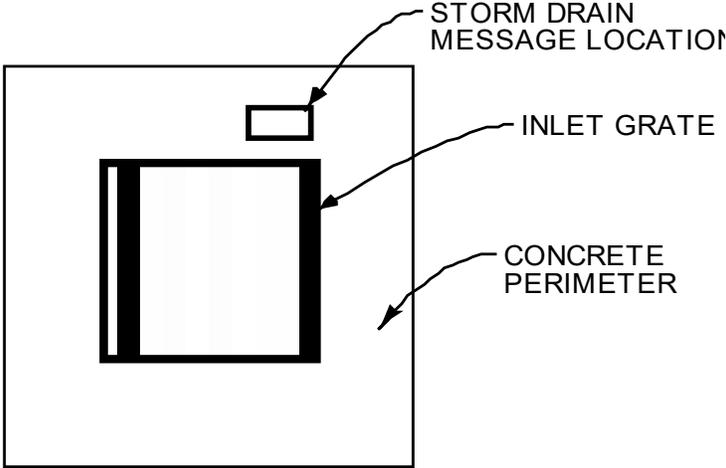
Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association shall enter into a Maintenance Agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards and signs.



CURB TYPE INLET

NOTES:

- 1. STORM DRAIN MESSAGE SHALL BE APPLIED IN SUCH A WAY AS TO PROVIDE A CLEAR, LEGIBLE IMAGE.
- 2. STORM DRAIN MESSAGE SHALL BE PERMANENTLY APPLIED DURING THE CONSTRUCTION OF THE CURB AND GUTTER USING A METHOD APPROVED BY THE LOCAL AGENCY.



AREA TYPE INLET

Figure 5-1: Storm Drain Message Location

S-2: Outdoor Material Storage Area Design

Purpose

Materials that are stored outdoors could become sources of pollutants in stormwater runoff if not handled or stored properly. Materials could be in the form of raw products, by-products, finished products, and waste products. The type of pollutants associated with the materials will vary depending on the type of commercial or industrial activity.

Some materials are more of a concern than others. Toxic and hazardous materials must be prevented from coming in contact with stormwater. Non-toxic or non-hazardous materials do not have to be prevented from stormwater contact, but cannot be allowed to runoff with the stormwater. These materials may have toxic effects on receiving waters. Accumulated material on an impervious surface could result in significant debris and sediment being discharged with stormwater runoff causing a significant impact on the rivers or streams that receive the runoff.

Materials may be stored in a variety of ways, including bulk piles, containers, shelving, stacking, and tanks. Stormwater contamination may be prevented by eliminating the possibility of stormwater contact with the material storage areas either through diversion, cover, or capture of the stormwater. Control measures may also include minimizing the storage area. Control measures are site-specific and must meet local permitting agency requirements.

Design Criteria

Design requirements for material storage areas are governed by Building and Fire Codes and by current City or County ordinances and zoning requirements. Source Control Measures described in the Fact Sheet are intended to enhance and be consistent with these code and ordinance requirements. The following design features should be incorporated into the design of a material storage area when storing materials outside could contribute significant pollutants to the storm drain.

Table 5-2: Design Criteria for Outdoor Material Storage Area Design

Source Control Design Feature	Design Criteria
Surfacing	<ul style="list-style-type: none"> Construct the storage area base with a material impervious to leaks and spills.
Covers	<ul style="list-style-type: none"> Install a cover that extends beyond the storage area, or use a manufactured storage shed for small containers.
Grading/Containment	<ul style="list-style-type: none"> Minimize the storage area. Slope the storage area towards a dead-end sump to contain spills. Grade or berm storage areas to prevent run-on from surrounding areas. Direct runoff from downspouts/roofs away from storage areas.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-3: Outdoor Trash Storage Area Design

Purpose

Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations may be sources of stormwater pollution and include dumpsters, litter control, and waste piles. This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling.

Design Criteria

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local permitting agency ordinances and zoning requirements. The design criteria described in the Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulations.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria listed below are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler

should be contacted prior to the design of your site trash collection area to obtain established and accepted guidelines for designing trash collection areas. Conflicts or issues should be discussed with the local permitting agency.

The following trash storage area design controls were developed to enhance the local permitting agency codes and ordinances and should be implemented depending on the type of waste and the type of containment.

Table 5-3: Design Criteria for Outdoor Trash Storage Areas

Source Control Design Feature	Design Criteria
Surfacing	<ul style="list-style-type: none"> • Construct the storage area base with a material impervious to leaks and spills.
Screens/Covers	<ul style="list-style-type: none"> • Install a screen or wall around trash storage area to prevent offsite transport of loose trash. • Use lined bins or dumpsters to reduce leaking of liquid wastes. • Use water-proof lids on bins/dumpsters or provide a roof to cover enclosure (local permitting agency discretion) to prevent rainfall from entering containers.
Grading/Contouring	<ul style="list-style-type: none"> • Berm or grade the waste handling area to prevent run-on of stormwater. • Do not locate storm drains in immediate vicinity of the trash storage area.
Signs	<ul style="list-style-type: none"> • Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Maintenance Requirements

The owner/operator must maintain the integrity of structural elements that are subject to damage (e.g. screens, covers and signs). Maintenance Agreements between the local permitting agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local permitting agency, Maintenance Agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved. Refer to Appendix G and H for further guidance regarding Maintenance Plan Agreements.

S-4: Outdoor Loading/Unloading Dock Area Design

Purpose

Materials spilled, leaked, or lost during loading or unloading may collect on impervious surfaces or in the soil and be carried away by runoff or when the area is cleaned. Rainfall may also wash pollutants from machinery used to load or unload materials. Depressed loading docks (truck wells) are contained areas that can accumulate stormwater runoff. Discharge of spills or contaminated stormwater to

the storm drain system is prohibited. This Fact Sheet contains details on specific measures recommended to prevent or reduce pollutants in stormwater runoff from outdoor loading or unloading areas.

Design Criteria

Design requirements for outdoor loading and unloading of materials are governed by Building and Fire Codes, and by current local permitting agency ordinances and zoning requirements. Source Control Measures described in this Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements. Companies may have their own design or access requirements for loading docks. The design criteria listed below are not intended to be in conflict with requirements established by individual companies. Conflicts or issues should be discussed with the local permitting agency.

The following design criteria should be followed when developing construction plans for material loading and unloading areas:

Table 5-4: Design Criteria for Outdoor Loading/ Unloading Areas

Source Control Design Feature	Design Criteria
Surfacing	<ul style="list-style-type: none"> • Construct floor surfaces with materials that are compatible with materials being handled in the loading/unloading area.
Covers	<ul style="list-style-type: none"> • Cover loading/unloading areas to a distance of at least 3 feet beyond the loading dock or install a seal or door skirt to be used for all material transfers between the trailer and the building.
Grading/Contouring	<ul style="list-style-type: none"> • Grade or berm storage the areas to prevent run-on from surrounding areas. • Direct runoff from downspouts/roofs away from loading areas.
Emergency Storm Drain Seal	<ul style="list-style-type: none"> • Do not locate storm drains in the loading dock area. Direct connections to storm drains from depressed loading docks are prohibited. • Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces, such as depressed loading docks. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-5: Outdoor Repair/Maintenance Bay Design

Purpose

Activities that can contaminate stormwater include engine repair, service, and parking (i.e. leaking engines or parts). Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can severely impact stormwater if allowed to come into contact with stormwater runoff. This Fact Sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment maintenance and repair areas.

Design Criteria

Design requirements for vehicle maintenance and repair areas are governed by Building and Fire Codes, and by current local permitting agency ordinances, and zoning requirements. The design criteria described in this Fact Sheet are meant to enhance and be consistent with these code requirements.

The following design criteria are required for vehicle and equipment maintenance, and repair. All wash water, hazardous and toxic wastes must be prevented from entering the storm drainage system.

Source Control Design Feature	Design Criteria
Surfacing	<ul style="list-style-type: none"> • Construct the vehicle maintenance/repair floor area with Portland cement concrete.
Covers	<ul style="list-style-type: none"> • Cover or berm areas where vehicle parts with fluids are stored. • Cover or enclose all vehicle maintenance/repair areas.
Grading/ Contouring	<ul style="list-style-type: none"> • Berm or grade the maintenance/repair area to prevent run-on and runoff of stormwater or runoff of spills. • Direct runoff from downspouts/roofs away from maintenance/repair areas. • Grade the maintenance/repair area to drain to a dead-end sump for collection of all wash water, leaks and spills. Direct connection of maintenance/repair area to storm drain system is prohibited. • Do not locate storm drains in the immediate vicinity of the maintenance/repair area.
Emergency Storm Drain Seal	<ul style="list-style-type: none"> • Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-6: Outdoor Vehicle/Equipment/Accessory Washing Area Design

Purpose

Washing vehicles and equipment in areas where wash water flows onto the ground can pollute stormwater. Wash waters are not allowed in the storm drain system. They can contain high concentrations of oil and grease, solvents, phosphates and high suspended solids loads. Sources of washing contamination include outside vehicle/equipment cleaning or wash water discharge to the ground. This Fact Sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment washing areas.

Design Criteria

Design requirements for vehicle maintenance and repair areas are governed by Building and Fire Codes, and by current local permitting agency ordinances, and zoning requirements. The design criteria described in this Fact Sheet are meant to enhance and be consistent with these code requirements.

The following design criteria are required for vehicle and equipment washing areas. All hazardous and toxic wastes must be prevented from entering the storm drain system.

Source Control Design Feature	Design Criteria
Surfacing	<ul style="list-style-type: none"> Construct the vehicle/equipment wash area floors with Portland cement concrete.
Covers	<ul style="list-style-type: none"> Provide a cover that extends over the entire wash area.
Grading/Contouring	<ul style="list-style-type: none"> Berm or grade the maintenance/repair area to prevent run-on and runoff of stormwater or runoff of spills. Grade or berm the wash area to contain the wash water within the covered area and direct the wash water to treatment and recycle or pretreatment and proper connection to the sanitary sewer system. Obtain approval from the governing agency before discharging to the sanitary sewer. Direct runoff from downspouts/roofs away from wash areas. Do not locate storm drains in the immediate vicinity of the wash area.
Emergency Storm Drain Seal	<ul style="list-style-type: none"> Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-7: Fueling Area Design

Purpose

Spills at vehicle and equipment fueling areas can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by stormwater treatment devices. When stormwater mixes with fuel spilled or leaked onto the ground, it becomes polluted by petroleum-based materials that are harmful to humans, fish, and wildlife. This could occur at large industrial sites or at small commercial sites such as gas stations and convenience stores. This Fact Sheet contains details on specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment fueling areas, including retail gas stations.

Design Criteria

Design requirements for fueling areas are governed by Building and Fire Codes and by current local permitting agency ordinances and zoning requirements. The design requirements described in this Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements.

Source Control Design Feature	Design Criteria
Surfacing	<ul style="list-style-type: none"> • Fuel dispensing areas must be paved with Portland cement concrete. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assemble may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the “fuel dispensing area” stated above. • Use asphalt sealant to protect asphalt paved areas surrounding the fueling area.
Covers	<ul style="list-style-type: none"> • The fuel dispensing area must be covered ¹, and the cover’s minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
Grading/ Contouring	<ul style="list-style-type: none"> • The fuel dispensing area should have a 2% to 4% slope to prevent ponding and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable. • Grade the fueling area to drain toward a dead-end sump. • Direct runoff from downspouts/roofs away from fueling areas. • Do not locate storm drains in the immediate vicinity of the fueling area.

Source Control Design Feature	Design Criteria
Emergency Storm Drain Seal	<ul style="list-style-type: none"> • Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

1. If fueling large equipment or vehicles that would prohibit the use of covers or roofs, the fueling island should be designed to sufficiently accommodate the larger vehicles and equipment and to prevent run-on and runoff of stormwater. Grade to direct stormwater to a dead-end sump.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-8: Proof of Control Measure Maintenance

Purpose

Continued effectiveness of control measures specified in the 2011 TGM depends on diligent ongoing inspection and maintenance. To ensure that such maintenance is provided, the local permitting agency will require both a Maintenance Agreement and a Maintenance Plan from the owner/operator of stormwater control measures.

Maintenance Agreement

Onsite Treatment Control Measures are to be maintained by the owner/operator. Maintenance Agreements between the governing agency and the owner/operator may be required. A Maintenance Agreement with the governing agency must be executed by the owner/operator before occupancy of the project is approved. A sample Maintenance Agreement form is provided in Appendix H.

Maintenance Plan

A post-construction Maintenance Plan shall be prepared and made available at the governing agency’s request. The Maintenance Plan should address items such as:

- Operation plan and schedule, including a site map;
- Maintenance and cleaning activities and schedule;
- Equipment and resource requirements necessary to operate and maintain facility; and
- Responsible party for operation and maintenance.

Additional guidelines for Maintenance Plans are provided in Appendix I.

6 STORMWATER BMP DESIGN

6.1 Introduction

Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are required to augment Site Design Principles and Techniques and Source Control Measures to reduce pollution from stormwater discharges to the maximum extent practicable. Retention BMPs are engineered facilities that are designed to retain surface runoff on the project site. Biofiltration BMPs are vegetated stormwater BMPs that remove pollutants by filtering stormwater through vegetation and soils. Treatment Control Measures are engineered BMPs that provide a reduction of pollutant loads and concentrations in stormwater runoff. The type(s) of Retention BMPs and Biofiltration BMPs to be implemented depends on site suitability factors discussed in this chapter. The type of Treatment Control Measure(s) to be implemented at a site depends on a number of factors including: type of pollutants in the stormwater runoff, quantity of stormwater runoff to be treated, project site conditions, receiving water conditions, and state industrial permit requirements, where applicable. Land requirements and costs to design, construct, and maintain Treatment Control Measures vary by type.

Unlike flood control measures that are designed to handle peak flows, stormwater Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are designed to retain or treat the more frequent, lower-flow storm events, or the first flush runoff from larger storm events (typically referred to as the first flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. It's the volume from such small events, referred to as the Stormwater Quality Design Volume (SQDV), that is targeted for retention onsite in Retention BMPs. Biofiltration BMPs and Treatment Control Measures can be sized to capture either the SQDV or the Stormwater Quality Design Flow (SQDF). Calculation methods for the SQDV and the SQDF are presented in [Section 2](#) and Appendix E.

6.2 General Considerations

Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are designed to remove pollutants contained in stormwater runoff. The pollutants of concern, depending on the watershed, may include trash, debris, and sediment; metals such as copper, lead, and zinc; nutrients such as nitrogen and phosphorous; certain bacteria and viruses; mineral salts such as chloride; and organic chemicals such as petroleum hydrocarbons and pesticides. Pollutant removal methods include sedimentation/settling, filtration, plant uptake, ion exchange, adsorption, and microbially-mediated decomposition. Floatable pollutants such as oil, debris, and scum can be removed with separator structures. Retention BMPs, Biofiltration BMPs, and some Treatment Control Measures are also designed to reduce runoff volume, thereby reducing pollutant loading to receiving waters. Retention BMP,

Biofiltration BMPs, and Treatment Control Measure types and common terms used in stormwater treatment are discussed below.

Maintenance Responsibility

Unless otherwise agreed to by the governing stormwater agency, the landowner, site operator, or homeowner's association is responsible for the operation and maintenance of the Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Failure to properly operate and maintain the measures could result in reduced treatment of stormwater runoff or a concentrated loading of pollutants to the storm drain system. To protect against failure, a Maintenance Plan must be developed and implemented for all Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Guidelines for maintenance plans are provided in Appendix I of the 2011 TGM. The Plan must be made available at the agency's request. In addition, a maintenance agreement with the governing agency may be required. The example maintenance agreements are included in Appendix H.

In addition to maintenance, the governing agency may require water quality monitoring agreements for any of the Retention BMPs, Biofiltration BMPs, or Treatment Control Measures recommended in the 2011 TGM. Monitoring may be conducted by the site operator, the agency, or both. Monitoring may be required for a period of time to help the agency evaluate the effectiveness of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures in reducing pollutants in stormwater runoff.

Pretreatment

Pretreatment must be provided for filtration and infiltration facilities and other facilities whose function could be adversely affected by sediment or other pollutants. Pretreatment may also be provided for water quality detention basins and other Treatment Control Measures to facilitate the routine removal of sediment, trash, and debris, and to increase the longevity of the downstream BMPs.

Pretreatment may be provided by presettling basins or forebays (small detention basins), vegetated swales, filter strips, and hydrodynamic separators. Source control activities, described in Chapter 5, minimize the introduction of pollutants into stormwater runoff and also help to protect filtration and infiltration facilities. Effort should be made early in the site planning stages to minimize runoff from impervious areas by grading toward landscaped areas, disconnecting downspouts, and using pervious conveyances prior to discharging to the storm drain system. These site design practices can reduce the size and maintenance burden of downstream, end-of-pipe BMPs.

Oil/Water Separation

Oil/water separators remove floating oil from the water surface. There are two general types of separators: American Petroleum Institute (API) separators and

coalescing plate (CP) separators. Both types use physical mechanisms to remove high concentrations of floating and dispersed oil. Oil/water separators are not suitable for the relatively low concentrations of petroleum hydrocarbons present in typical urban runoff, and should only be used in locations where higher concentrations of oil are expected to occur, such as retail fuel facilities, high volume roads, and petroleum-related industrial facilities. Oil/water separators must be located off-line from the primary conveyance system, as they function at low flow conditions and will wash out in high flow conditions. Other oil control devices/facilities that may be used for pretreatment of slightly elevated concentrations of oil (i.e., typical of high use commercial parking lots) include catch basin inserts, hydrodynamic devices, and linear sand filters. Oil control devices/facilities should always be placed upstream of other treatment facilities and as close to the oil source as possible.

Infiltration

Infiltration refers to the use of the filtration, adsorption, and biological decomposition properties of soils to remove pollutants prior to the intentional routing of runoff to the subsurface for groundwater recharge. Infiltration BMPs are a type of Retention BMP and include [infiltration basins](#), [infiltration trenches](#), [bioretention](#) without an underdrain, [dry wells](#), [permeable pavement](#), and [proprietary infiltration devices](#). Infiltration can provide multiple benefits including pollutant removal, hydromodification control, groundwater recharge, and flood control. However, conditions that can limit the use of infiltration include soil properties and potential adverse impacts on groundwater quality. A geotechnical investigation must be conducted when evaluating infiltration to determine the suitability of the site soil in adequately addressing groundwater protection. This may include an in-situ percolation test, per the guidance provided in Appendix C, and the determination of minimum depth to groundwater. The minimum separation to seasonal high groundwater or estimated mounded groundwater is five feet. Depth to seasonal high groundwater level shall be estimated as the average of the annual minima (i.e., the shallowest recorded measurements in each water year, defined as October 1 through September 30) for all years on record. If groundwater level data are not available or not considered to be representative, seasonal high groundwater depth can be determined by redoximorphic analytical methods combined with temporary groundwater monitoring for November 1 through April 1 at the proposed project site.

Soils should have sufficient organic content and sorption capacity to remove certain pollutants, but must be coarse enough to infiltrate runoff in a reasonable amount of time (e.g., < 72 hours for above-ground ponded water to prevent vector breeding). Examples of suitable soils are silty and sandy loams. Coarser soils, such as gravelly sands, have limited organic content and high permeability and therefore present a potential risk to groundwater from certain pollutants, especially in areas of shallow groundwater. Prior to the use of infiltration BMPs, consult with the local permitting agency to identify if vulnerable unconfined aquifers are located beneath the project to determine the appropriateness of these BMPs. In an area identified as an unconfined

aquifer, the application of infiltration BMPs should include significant pretreatment to ensure groundwater is protected from pollutants of concern.

Infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk. Infiltration BMPs may be placed in high-risk areas if a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

In addition, infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project. Adequate spacing (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Infiltration is not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would not be detrimental. A site-specific analysis shall be prepared where pollutant mobilization (e.g., naturally-derived groundwater pollutants) is a concern. Projects must consider the potential for mobilization of groundwater contamination from natural sources as a result of stormwater infiltration (e.g., marine sediments, selenium-rich groundwater) to the extent that data is available.

Incidental infiltration that occurs in other types of Biofiltration BMPs and Treatment Control Measures, such as dry extended detention basins, vegetation swales, filter strips, and bioretention areas with underdrains, pose little risk to groundwater quality as treatment is provided in the BMP prior to infiltration.

Biofiltration BMPs

Biofiltration BMPs use vegetation and soils or other filtration media for runoff treatment. As runoff passes through the vegetation and filtration media, the combined effects of filtration, adsorption, and biological uptake remove pollutants. In biofiltration BMPs, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the pollutant adsorption (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants use soil moisture, promote the drying of the soil through transpiration, and uptake pollutants in their roots and leaves. Plants with extensive root systems also help to maintain filtration rates. Vegetation also decreases the velocity of flow and allows for particulates to settle.

Treatment Control Measures

Filtration

Various media, such as sand, perlite, zeolite, compost, and activated carbon, can be used in filtration BMPs to effectively remove total suspended solids (TSS) and associated pollutants such as organics (hydrocarbons and pesticides) and particulate metals. Filtration systems can be configured in the form of horizontal beds, trenches, or lastly, cartridge systems in underground vaults or catch basins.

Wetpools

A wetpool is a permanent pool of water incorporated into a wetpond or stormwater wetland BMP. Wetpools provide runoff treatment by allowing settling of particulates (sedimentation) by biological uptake and by vegetative filtration (if vegetation is present). Wetpool BMPs may be single-purpose facilities, providing only runoff treatment, or they may also provide flow control by providing additional detention storage with the use of a multi-stage outlet structure. If combined with detention, the wetpool volume can often be stacked under the detention volume with little further loss of development area.

“On-line” and “Off-line” Facilities

The location and configuration of control facilities can vary depending on the desired function. For example, drop structures or grade control may be located in a drainage channel so as to stabilize a channel for hydromodification control purposes. Such facilities are referred to as “in-stream” controls. Retention BMPs, Biofiltration BMPs, and Treatment Control Measures may not be located in-stream. Retention BMPs, Biofiltration BMPs, and Treatment Control Measures cannot be located in Waters of the US, but rather must be located upland to retain or treat runoff prior to discharge into Waters of the US.

If a Retention BMP, Biofiltration BMP, or Treatment Control Measure facility is designed such that all the runoff passes through the facility, the facility is called an “on-line” system. However, care must be taken to limit the resuspension of previously captured pollutants or damage to BMP performance during high flows. If, on the other hand, the facility only receives flows less than or equal to the stormwater quality design flow (SQDF), the facility is called an “off-line” system. Off-line systems therefore require a flow splitter or equivalent device. Generally treatment performance is better for off-line facilities because a larger percentage of the runoff is treated. Figure 6-1 illustrates the difference between on-line, off-line, and in-stream controls.

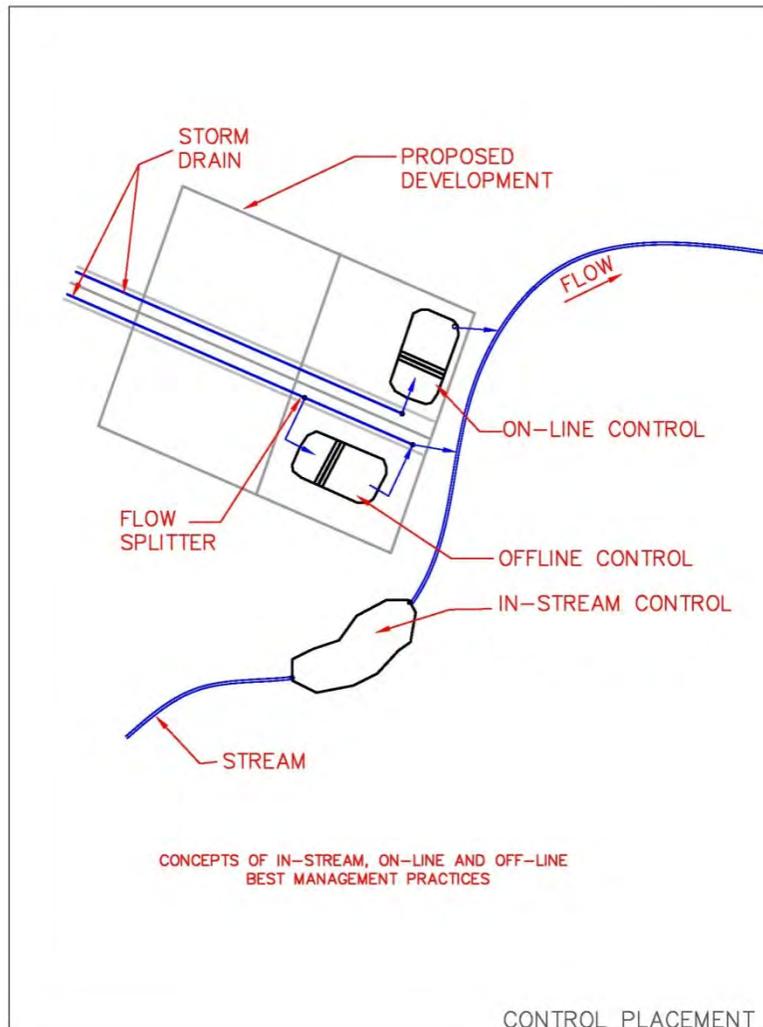


Figure 6-1: Differences between On-line, Off-line, and In-stream Control Measures

6.3 Retention BMP, Biofiltration BMP, and Treatment Control Measure Fact Sheets

This section provides fact sheets with recommended criteria for the design and implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. The siting, design, and maintenance requirements in the fact sheets are intended to ensure optimal performance of the measures. Alternative designs may be approved by the local permitting authority based on site specific conditions if equivalent pollutant removal performance is provided.

The 2011 TGM also contains calculation worksheets to aid in the design of these BMPs in Appendix E. New BMPs that are equivalent to those included in the 2011 TGM are acceptable based on approval of the local permitting agency.

Fact sheets are provided for the Retention BMPs, Biofiltration BMPs, and Treatment Control Measures listed below:

Retention BMPs

Infiltration BMPs

- [INF-1: Infiltration Basin](#)
- [INF-2: Infiltration Trench](#)
- [INF-3: Bioretention](#)
- [INF-4: Drywell](#)
- [INF-5: Permeable Pavement](#)
- [INF-6: Proprietary Infiltration](#)

Rainwater Harvesting BMPs

- [RWH-1: Rainwater Harvesting](#)

Evapotranspiration BMPs

- [ET-1: Green Roof](#)
- [ET-2: Hydrologic Source Controls](#)

Biofiltration BMPs

- [BIO-1: Bioretention with Underdrain](#)
- [BIO-2: Planter Box](#)
- [BIO-3: Vegetated Swale](#)
- [BIO-4: Vegetated Filter Strip](#)
- [BIO-5: Proprietary Biotreatment](#)

Treatment Control Measures

- [TCM-1: Dry Extended Detention Basin](#)
- [TCM-2: Wet Detention Basin](#)
- [TCM-3: Constructed Wetland](#)
- [TCM-4: Sand Filter](#) (if vegetated, this is considered a Biofiltration BMP)
- [TCM-5: Cartridge Media Filter](#)

Pretreatment/Gross Solids Removal BMPs

- [PT-1: Hydrodynamic Device](#)
- [PT-2: Catch Basin Insert](#)

INF-1: Infiltration Basin

An infiltration basin consists of an earthen basin constructed in naturally pervious soils (Type A or B soils) with a flat bottom and provided with an inlet structure to dissipate energy of incoming flow and an emergency spillway to control excess flows. An optional relief underdrain may be provided to drain the basin if standing water conditions occur. A forebay settling basin or separate Treatment Control Measure must be provided as pretreatment. An infiltration basin functions by retaining the SQDV in the basin and allowing the retained runoff to percolate into the underlying native soils over a specified period of time. The bottoms of infiltration basins are typically vegetated with dry-land grasses or irrigated turf grass. A typical layout of an infiltration basin system is shown in Figure 6-2.



Infiltration Basin in a Fresno, CA Park, Before and After a Rain Event

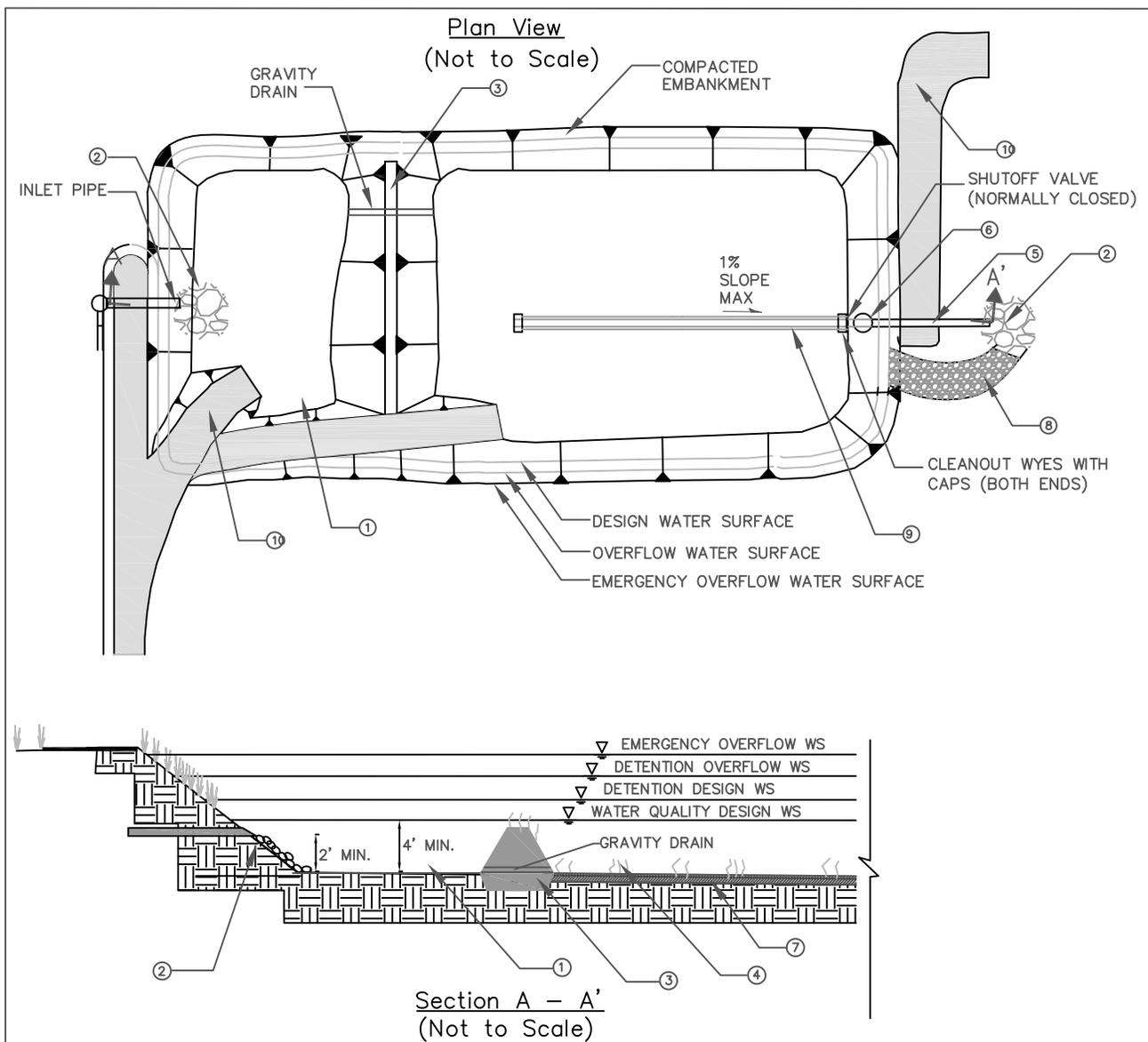
Photo Credit: Geosyntec Consultants

Application

- Mixed-use and commercial
- Roads and parking lots
- Parks and open spaces
- Single and multi-family residential
- Can integrate with parks

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Remove weeds
- Inspect for mosquito breeding



NOTES:

- ① UPSTREAM PRETREATMENT SHALL BE PROVIDED. SEDIMENT FOREBAY WITH VOLUME EQUAL TO 25% OF TOTAL INFILTRATION BASIN VOLUME MAY BE USED IN LIEU OF UPSTREAM PRETREATMENT. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1 FOOT MIN SEDIMENT STORAGE DEPTH.
- ② RIP RAP APRON OR OTHER ENERGY DISSIPATION.
- ③ EXTEND EARTHEN BERM ACROSS ENTIRE WIDTH OF THE INFILTRATION BASIN.
- ④ INFILTRATION BASIN BOTTOM AND SIDE SLOPES SHALL BE PLANTED WITH DROUGHT TOLERANT VEGETATION. DEEP ROOTED VEGETATION PREFERRED FOR BASIN BOTTOM. NO TOPSOIL SHALL BE ADDED TO INFILTRATION BASIN BED.
- ⑤ SIZE OUTLET PIPE TO PASS 100-YEAR PEAK FLOW FOR ON-LINE INFILTRATION BASINS AND WATER QUALITY PEAK FLOW FOR OFF-LINE INFILTRATION BASINS.
- ⑥ WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7-2 AND FIGURE 7-3 FOR DETAILS.
- ⑦ OVER EXCAVATE BASIN BOTTOM 1 FOOT. RE-PLACE EXCAVATED MATERIAL UNIFORMLY WITHOUT COMPACTION. AMENDING EXCAVATED MATERIAL WITH 2" - 4" OF COARSE SAND IS RECOMMENDED FOR SOILS WITH BORDER LINE INFILTRATION CAPACITY.
- ⑧ INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2-4 FOR DETAILS
- ⑨ INSTALL OPTIONAL 6" MINIMUM DIAMETER PERFORATED PIPE UNDERDRAIN. INSTALL AT 0.5% MINIMUM SLOPE.
- ⑩ MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.

	
Figure 6-2: Infiltration Basin	

Limitations

The following limitations should be considered before choosing to use an infiltration basin:

- Native soil infiltration rate - permeability of soils at the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback at least eight feet from building foundations or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater, where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Additional Control Functions

Infiltration basins can be designed for flow control by providing storage capacity in excess of that provided by infiltration and incorporating outlet controls. The additional storage and outlet structure should be provided per the requirements outlined in the [Dry Extended Detention Basins](#) section of the 2011 TGM. Note that the selected outlet structure should not be designed to drain the design volume intended for infiltration and should be similar to outlet structures that maintain a permanent pool (see Section 6.10.2 – Wet Retention Basins).

Multi-Use Opportunities

Infiltration basins may be integrated into the design of a park or playfield. Recreational multi-use facilities should be inspected after every storm and may require a greater maintenance frequency than dedicated infiltration basins to ensure aesthetics and public safety are not compromised. Any planned multi-use facility must obtain approval by the affected City and County departments.

Design Criteria

The main challenge associated with infiltration basins is preventing system clogging and subsequent infiltration inhibition. Infiltration basins should be designed according to the requirements listed in Table 6-1 and outlined in the section below. Detailed design procedures and an example are included in Appendix E.

Table 6-1: Infiltration Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-foot	See Section 2.3 and Appendix E for calculating SQDV
Design drawdown time	hr	12 - 72 (See Appendix D, Section D.2)
Bottom basin Elevation	feet	5 feet above seasonally high groundwater table or mounded groundwater
Setbacks	feet	100 feet from wells, fields, and springs; 20 feet downslope of 100 feet upslope of foundations; Geotechnical expert should establish the setback requirement from building foundations that must be ≥ 8 ft.
Pretreatment	-	Sedimentation forebay or any Treatment Control Measure shall be provided as pretreatment for all tributary surfaces other than roofs.

Design Parameter	Unit	Design Criteria
Design percolation rate (P_{design})	in/hr	Measured percolation rate must be corrected based onsite suitability assessment and design related considerations described in this fact sheet.
Facility geometry	-	Forebay (if applicable): 25% of facility volume; flat bottom slope
Freeboard (minimum)	ft	1.0
Inlet/ Outlet erosion control	-	Energy dissipater to reduce velocity
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity.. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

- 1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. Pretreatment is required in all instances.
- 2) Groundwater separation must be at least 5 feet from the basin bottom to the measured [Seasonal High Groundwater Elevation](#) or estimated high groundwater mounding elevation. Groundwater levels measurements must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).
- 3) Potential BMP sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located within 50 feet of slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed infiltration basin;

- Recommend a design percolation rate (see “*Step 2: Determine The Design Percolation Rate*” below);
- Identify the seasonally high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
 - Provide a written opinion by a professional civil engineer describing whether the infiltration basin will compromise slope stability; and
 - Identify potential impacts to nearby structural foundations.

Setbacks

- 1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.
- 2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- 3) The geotechnical expert shall establish the setback requirement from building foundations that must be ≥ 8 ft.

Pretreatment

Pretreatment is required for infiltration basins in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice; easing the long-term maintenance burden. Pretreatment is important for most all structural stormwater BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes and hydrodynamic separation devices. The use of at least two pretreatment devices is highly recommended for infiltration basins.

For design specification of selected pretreatment devices, refer to:

- [BIO-3: Vegetated swales](#)
- [BIO-4: Vegetated filter strips](#)
- [TCM-4: Sand filters](#)

- [TCM-5: Cartridge media filters](#)
- [PT-1: Hydrodynamic separation device](#)

Sizing Criteria

As with sand filters, infiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 12 to 72 hours (see Appendix D, Section D.2 for a discussion on drawdown time and BMP performance). The simple sizing procedures provided below can be used for either infiltration basins or infiltration trenches (see [INF-2: Infiltration Trench](#)). For the routing modeling method, refer to [TCM-4 Sand Filters](#).

Step 1: Calculate the Design Volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see [Section 2](#) and Appendix E) with a 12 to 72 hour drawdown time (see Appendix D, Section D.2).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltrative layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils and not the percolation rate of the filter media bed (refer to the “[Geometry and Sizing](#)” section of INF-2 for the recommended composition of the filter media bed for infiltration trenches).

Considerations for Design Percolation Rate Corrections

Suitability assessment related considerations include (Table 6-2):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally), as determined from site investigations, are more difficult to estimate average properties resulting in a higher level of uncertainty associated with initial estimates.

- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table 6-2: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 ($f = 0.5 - 0.64$)	4 or 5 ($f = 0.65 - 0.91$)	6 or 7 ($f = 0.92$ or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88), which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Design related considerations include (Table 6-3):

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.
- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.
- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass, should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated by another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example. Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-3: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens, AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors using the worksheet shown in Table 6-4 below. The design percolation rate would be determined as follows:

- For each consideration shown in Table 6-2 and Table 6-3 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.

- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short-term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-4: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor = $S_A \times S_B$					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus (for infiltration trenches) the void spaces based on the computed porosity of the filter media (normally about 32%).

- 1) Determine the maximum depth of runoff that can be infiltrated within the required drain time (d_{max}) as follows:

$$d_{max} = \frac{P_{design}}{12} t \tag{Equation 6-1}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr)
t	=	required drain time (hrs)

2) Choose the ponding depth (d_p) and/or trench depth (d_t) such that:

$$d_{max} \geq d_p \quad \text{For Infiltration Basins} \quad (\text{Equation 6-2})$$

$$d_{max} \geq n_t d_t + d_p \quad \text{For Infiltration Trenches} \quad (\text{Equation 6-3})$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
d_p	=	ponding depth (ft)
n_t	=	trench fill aggregate porosity (unitless)
d_t	=	depth of trench fill (ft)

3) Calculate infiltrating surface area (filter bottom area) required:

$$A = \frac{SQDV}{((TP_{design} / 12) + d_p)} \quad \text{For Infiltration Basins} \quad (\text{Equation 6-4})$$

$$A = \frac{SQDV}{((TP_{design} / 12) + n_t d_t + d_p)} \quad \text{For Infiltration Trenches} \quad (\text{Equation 6-5})$$

Where:

$SQDV$	=	stormwater quality design volume (ft ³)
n_t	=	trench fill aggregate porosity (unitless)
P_{design}	=	design percolation rate (in/hr)
d_p	=	ponding depth (ft)
d_t	=	depth of trench fill (ft)
T	=	fill time (time to fill to max ponding depth with water) (hrs) [use 2 hours for most designs]

Geometry and Sizing

- 1) Infiltration basins should be designed and constructed with the flattest bottom slope possible to promote uniform ponding and infiltration across the facility.
- 2) A sediment forebay is required unless adequate pretreatment is provided in a separate pretreatment unit (e.g., vegetated swale, filter strip, hydrodynamic device) to reduce sediment loads entering the infiltration basin. The sediment forebay, if present, should have a volume equal to 25% of the total infiltration basin volume.
- 3) The forebay should be designed with a minimum length to width ratio of 2:1 and should completely drain to the main basin through an 8-inch minimum low-flow outlet within 10 minutes.
- 4) All inlets should enter the sediment forebay. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.
- 5) Design embankments to conform to requirements of the State of California Division of Safety of Dams, if the basin dimensions cause it to fall under that agency's jurisdiction.

Drainage

- 1) The bottom of the infiltration bed should be native soil, over-excavated to at least one foot in depth, and replaced uniformly without compaction. Amending the excavated soil with 2-4 inches (~15-30%) of coarse sand is recommended.
- 2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure a maximum 72-hr drawdown time. An observation well shall be incorporated to allow observation of drain time.
- 3) For infiltration basins, an underdrain should be installed within the bottom layer to provide drainage in case of standing water. The underdrain should be operated by opening a valve, which should be closed during normal operation. Cleanouts should be provided for the underdrain. See Sand Filter Section VEG-8 for specifications for underdrains.

Emergency Overflow

- 1) There should be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.
- 2) The overflow channel should be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

- 3) Spillway and overflow structures should be designed in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

Vegetation

- 1) A thick mat of drought tolerant grass should be established on the basin floor and side-slopes following construction. Grasses can help prevent erosion and increase evapotranspiration and their roots discourage compaction helping to maintain the surface infiltration rates. Additionally, the active growing vegetation can help break up surface layers that accumulate fine particulates.
- 2) Grass may need to be irrigated during establishment.
- 3) For infiltration basins, landscaping of the area surrounding the basin should adhere to the following criteria so as not to hinder maintenance operations:
 - a. No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes.
 - b. Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

Maintenance Access

- 1) Maintenance access road(s) shall be provided to the drainage structures associated with the basin (e.g., inlet, emergency overflow, or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.
- 2) An access ramp to the basin bottom is required to facilitate the entry of sediment removal and vegetation maintenance equipment without compaction of the basin bottom and side slopes.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines are specified:

- 1) The entire area draining to the facility should be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entrance during construction.

- 2) Infiltration basins should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Infiltration basins should not be used as sediment control facilities.
- 3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility cannot be avoided, the infiltrative capacity should be restored by tilling or aerating prior to placing the infiltrative bed.
- 4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Infiltration facility maintenance should include frequent inspections to ensure that surface ponding infiltrates into the subsurface completely within the design infiltration time after a storm (see Appendix I for an infiltration BMP inspection and maintenance checklist).

Maintenance and regular inspections are of primary importance if infiltration BMPs are to continue to function as originally designed. A specific maintenance plan shall be formulated specifically for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

- 1) Regular inspection should determine if the pretreatment sediment removal BMPs require routine maintenance.
- 2) If water is noticed in the basin more than 72 hours after a major storm the infiltration facility may be clogged. Maintenance activities triggered by a potentially clogged facility include:
 - a. Check for debris/sediment accumulation, rake surface, and remove sediment (if any) and evaluate potential sources of sediment and debris (e.g., embankment erosion, channel scour, overhanging trees, etc). If suspected upland sources are outside of the immediate jurisdiction, additional pretreatment operations (e.g., trash racks, vegetated swales, etc.) may be necessary.
 - b. For basins, removal of the top layer of native soil may be required to restore infiltrative capacity.
 - c. Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.
 - d. Facilities shall be inspected annually. Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.

- 3) Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site, and as follows:
 - a. Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.
 - b. Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
 - c. Grass should be mowed to 4" - 9" high and grass clippings should be removed.
 - d. Fallen leaves and debris from deciduous plant foliage should be raked and removed.
 - e. Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the [encyclopededia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
 - f. Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.
- 4) For infiltration basins, sediment build-up exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment should be disposed of in a hazardous waste landfill and the source of the contaminated sediments should be investigated and mitigated to the extent possible.
- 5) Following sediment removal activities, replanting and/or reseeded of vegetation may be required for reestablishment.

INF-2: Infiltration Trench

Infiltration trenches are long, narrow, gravel-filled trenches, often vegetated, that infiltrate stormwater runoff from small drainage areas. Infiltration trenches may include a shallow depression at the surface, but the majority of runoff is stored in the void space within the gravel and infiltrates through the sides and the bottom of the trench.



Rural Highway Infiltration Trench

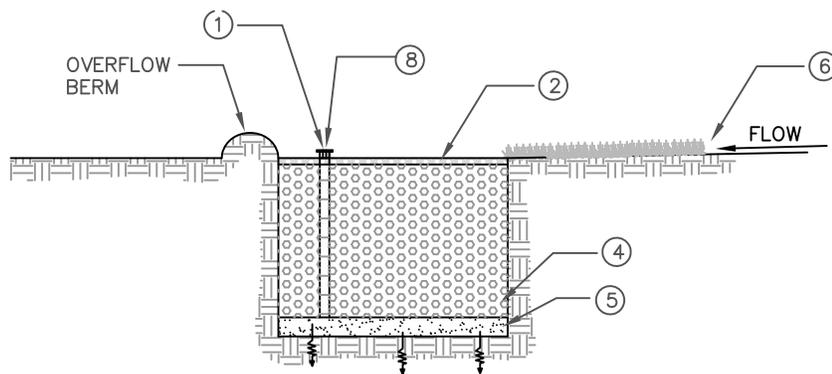
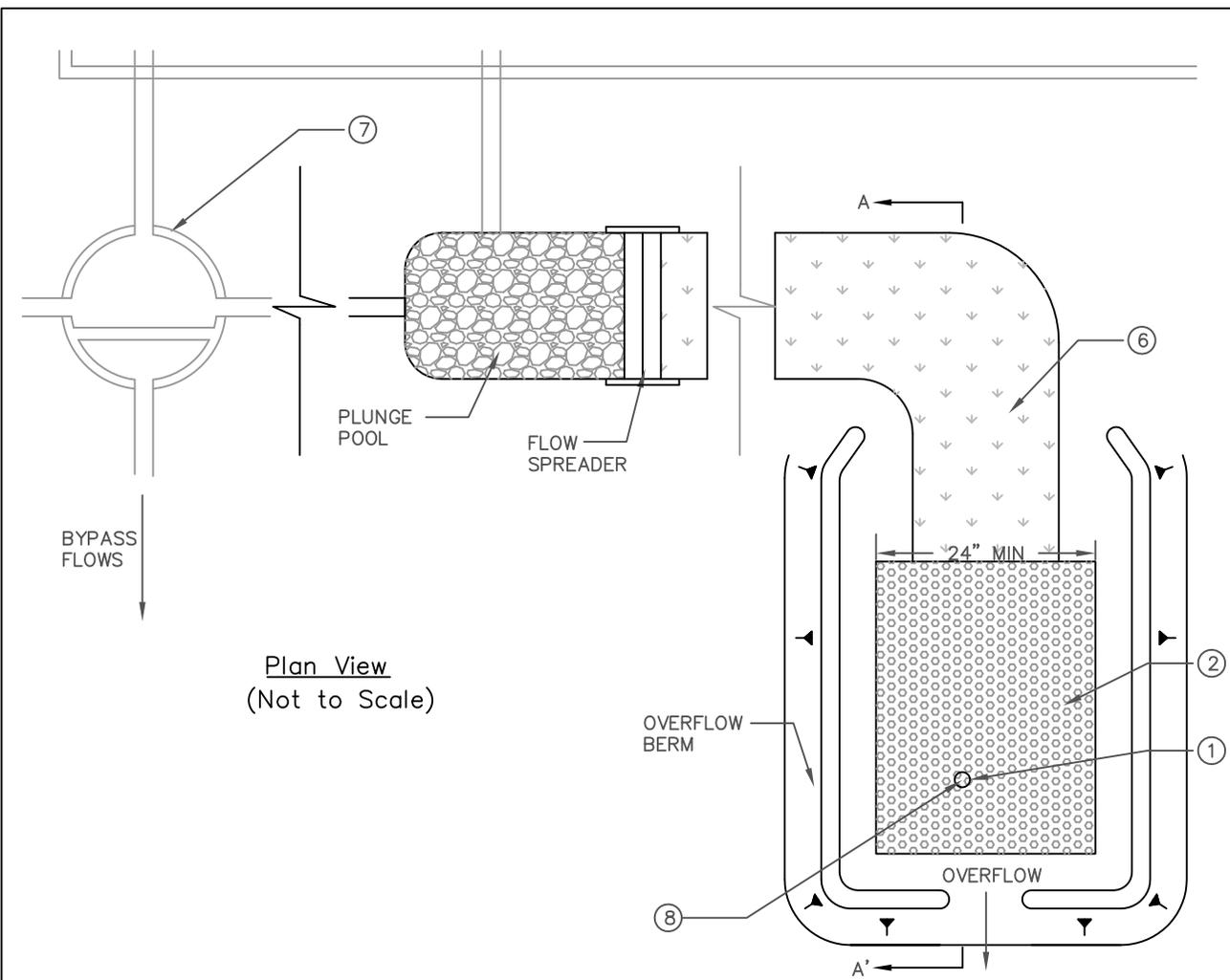
<http://stormwater.wordpress.com/2007/05/23/infiltration--trenches/>

Application

- Open areas adjacent to parking lots, driveways, and buildings
- Roadway medians and shoulders

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Remove weeds
- Inspect for mosquito breeding



NOTES:

- ① OBSERVATION WELL WITH LOCKABLE ABOVE-GROUND CAP.
- ② 2" PEA GRAVEL FILTER LAYER.
- ③ MINIMUM 10' ABOVE SEASONAL HIGH GROUNDWATER TABLE AND 3' ABOVE BEDROCK.
- ④ 3' - 5' DEEP TRENCH FILLED WITH 2" - 6" DIAMETER CLEAN STONE WITH 30% - 40% VOIDS.
- ⑤ 6" DEEP SAND FILTER LAYER (OR FABRIC EQUIVALENT).
- ⑥ RUNOFF FILTERS THROUGH GRASS FILTER STRIP OR VEGETATED SWALE.
- ⑦ OPTIONAL FLOW CONTROL DEVICE FOR OFF-LINE CONFIGURATIONS.



Figure 6-3: Infiltration Trench

Limitations

The following limitations should be considered before choosing to use an infiltration trench:

- Native soil infiltration rate – soil permeability at the infiltration trench location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields and springs. Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
 - Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Design Criteria

The main challenge associated with infiltration trenches is preventing system clogging and subsequent infiltration inhibition. Infiltration trenches should be designed according to the requirements listed in Table 6-5 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-5: Infiltration Trench Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Design drawdown time	hr	12 – 72, see Appendix D, Section D.2
Trench bottom elevation	feet	5 feet from seasonally high groundwater table
Setbacks	feet	100 feet from wells, fields, springs Geotechnical expert should establish the setback requirement from building foundations that must be ≥ 8 ft Do not locate under tree drip-lines
Pretreatment	-	BIO-3: Vegetated Swale , BIO-4: Filter Strip , proprietary device, or sedimentation forebay, for all surfaces other than roofs
Design percolation rate, (P_{design})	in/hr	Measured percolation rate must be corrected based onsite suitability assessment and design related considerations described in this fact sheet
Maximum depth of facility (d_{max})	feet	8.0; Defined by the design infiltration rate and the design drawdown time (includes ponding depth and depth of media)
Surface area of facility (A)	square feet	Based on depth of ponding (if applicable) and depth of trench media
Facility geometry	-	Minimum 24 inches wide and maximum 5 feet deep; max 3% bottom slope
Filter media diameter	inches	1 – 3 (gravel); prefabricated media may also be used
Trench lining material	-	Geotextile fabric
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

- 1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.
- 2) Groundwater separation must be at least 5 feet from the trench bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Groundwater level measurements must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).
- 3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed infiltration trench;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, “Determine the design percolation rate,” in the Infiltration Basin fact sheet above);
- Identify the seasonally high depth to groundwater table surface elevation.
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
 - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and

- Identify potential impacts to nearby structural foundations.

Setbacks

- 1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.
- 2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- 3) Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.

Pretreatment

Pretreatment is required for infiltration trenches in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice; easing the long-term maintenance burden. Pretreatment is important for most all structural stormwater BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes and hydrodynamic separation devices.

For design specification of selected pre-treatment devices, refer to:

- [VEG-3: Vegetated swales](#)
- [VEG-4: Vegetated filter strips](#)
- [TCM-4: Sand filters](#)
- [TCM-5: Cartridge media filters](#)
- [PT-1: Hydrodynamic separation device](#)

Sizing Criteria

See [Sizing Criteria](#) section in the INF-1: Infiltration Basin fact sheet.

Geometry and Sizing

- 1) Infiltration trenches should be at least 2 feet wide and 3 to 5 feet deep.
- 2) The longitudinal slope of the trench should not exceed 3%.
- 3) The filter bed media layers should have the following composition and thickness:

- a. Top layer – If stormwater runoff enters the top of the trench via sheet flow at the ground surface, then the top 2 inches should be pea gravel with a thin 2 to 4 inch layer of pure sand and 2 inch layer of choking stone (e.g., #8) to capture sediment before entering the trench. If stormwater runoff enters the trench from an underground pipe, pretreatment prior to entry into the trench is required.
 - b. Middle layer (3 to 5 feet of washed, 1.5 to 3 inch gravel). Void space should be in the range of 30 percent to 40 percent.
 - c. Bottom layer (6 inches of clean, washed sand to encourage drainage and prevent compaction of the native soil while the stone aggregate is added).
- 4) One or more observation wells should be installed, depending on trench length, to check for water level, drawdown time, and evidence of clogging. A typical observation well consists of a slotted PVC well screen, 4 to 6 inches in diameter, capped with a lockable, above-ground lid.

Drainage

- 1) The bottom of the infiltration bed must be native soil, over-excavated to at least one foot in depth and replaced uniformly without compaction. Amending the excavated soil with 2 to 4 inches (~15% to 30%) of coarse sand is recommended.
- 2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure the design drawdown time. An observation well should be incorporated to allow observation of drain time.

Emergency Overflow

- 1) There must be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.
- 2) The overflow channel must be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

Vegetation

- 1) Trees and other large vegetation should be planted away from trenches such that drip lines do not overhang infiltration beds.

Maintenance Access

- 1) The facility and outlet structures must all be safely accessible during wet and dry weather conditions.
- 2) An access road along the length of the trench is required, unless the trench is located along an existing road or parking lot that can be safely used for maintenance access.

- 3) If the infiltration trench becomes plugged and fails, then access is needed to excavate the facility to remove and replace the top layer or the filter bed media, as well as to increase all dimensions of the facility by 2 inches to provide a fresh surface for infiltration. To prevent damage and compaction, access must be able to accommodate a backhoe working at “arms length”.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines are specified:

- 1) The entire area draining to the facility must be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entering during construction.
- 2) Infiltration trenches should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Infiltration trenches should not be used as sediment control facilities.
- 3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility cannot be avoided, the infiltrative capacity should be restored by tilling or aerating prior to placing the infiltrative bed.
- 4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Infiltration facility maintenance should include frequent inspections to ensure that water infiltrates into the subsurface completely within the design drawdown time after a storm.

Maintenance and regular inspections are of primary importance if infiltration trenches are to continue to function as originally designed. A specific maintenance plan shall be developed specific to each facility outlining the schedule and scope of maintenance operations, as well as the documentation and reporting requirements. The following are general maintenance requirements:

- 1) Regular inspection should determine if the sediment pretreatment structures require preventative maintenance. Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.
- 2) If water is noticed in the observation well of the infiltration trench more than 72 hours after a major storm, the infiltration trench may be clogged. Maintenance activities triggered by a potentially clogged facility include:

- a. For trenches, assess the condition of the top aggregate layer for sediment buildup and crusting. Remove top layer of pea gravel and replace. If slow draining conditions persist, entire trench may need to be excavated and replaced.
- 3) Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.
- 4) Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.
- 5) Clean when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.
- 6) Mow as appropriate for vegetative cover species.
- 7) Monitor health of vegetation and replace as necessary.
- 8) Control mosquitoes as necessary.
- 9) Remove litter and debris from trench area as required.

INF-3: Bioretention

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. An optional gravel layer can be added below the planting soil to provide additional storage volume for infiltration. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. For areas with low permeability native soils or steep slopes, see section [INF-7: Bioinfiltration](#) or [BIO-1: Bioretention with Underdrain](#) for relevant design specifications.



Bioretention in Parkway and parking lots

Photo Credits: Geosyntec Consultants

Application

- Commercial, residential, mixed use, institutional, and recreational uses
- Parking lot islands, traffic circles
- Road parkways & medians

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

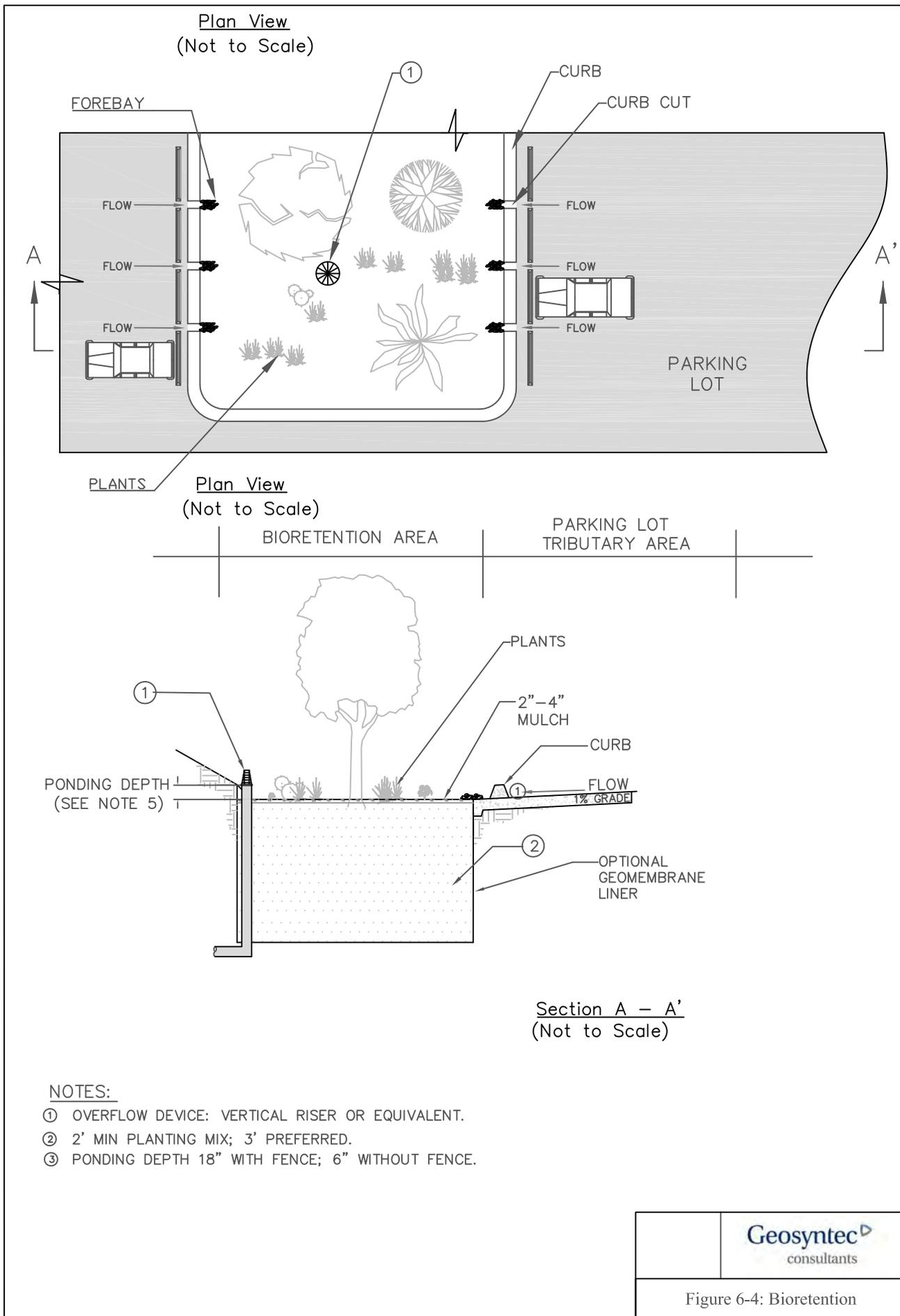


Figure 6-4: Bioretention

Limitations

The following limitations should be considered before choosing to use bioretention:

- 1) Native soil infiltration rate - soil permeability at the bioretention location must be at least 0.5 inches per hour.
- 2) Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- 3) Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- 4) Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- 5) Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
- 6) Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.
- 7) High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risk areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- 8) High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- 9) Vertical relief and proximity to storm drain - site must have adequate relief between the land surface and storm drain to permit vertical percolation through the soil media and collection.

Design Criteria

Bioretention should be designed according to the requirements listed in Table 6-6 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-6: Bioretention Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	48
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18
Minimum thickness of amended soil	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 3
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Overflow device	-	Required

Sizing Criteria

Bioretention facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 96 hours (including subsurface pore space), and surface ponding must be infiltrated within 48 hours. The simple sizing procedure is provided below. For the routing modeling method, refer to [TCM-4 Sand Filters](#).

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate through the BMP and to the subsurface will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For bioretention facilities, the design percolation rate discussed here is the adjusted percolation rate of the underlying soils and not the percolation rate of the filter media bed.

Considerations for Design Percolation Rate Corrections

Suitability assessment-related considerations include (Table 6-7):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties, resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88), which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Table 6-7: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 ($f = 0.5 - 0.64$)	4 or 5 ($f = 0.65 - 0.91$)	6 or 7 ($f = 0.92$ or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Design related considerations include:

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.
- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.
- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remain functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive

correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.

- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of bioretention facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-8: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens, AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors using the worksheet shown in Table 6-9 below. The design percolation rate would be determined as follows:

- For each consideration shown in Tables 6-7 and 6-8 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns assign a factor value of 3, for medium concerns assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.
- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short-term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-9: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \sum p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \sum p$			
Combined Safety Factor = $S_A \times S_B$					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

- 1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time (48 hr), (d_{max}), as follows:

$$d_{max} = \frac{P_{design} \times t_{ponding}}{12 \frac{in}{ft}} \quad (\text{Equation 6-6})$$

Where:

- $t_{ponding}$ = required drain time of surface ponding (48 hrs)
- P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)
- d_{max} = the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft), calculated using Equation 6-6

- 2) Choose surface ponding depth (d_p) such that:

$$d_p \leq d_{max} \quad (\text{Equation 6-7})$$

Where:

- d_p = selected surface ponding depth (ft)
- d_{max} = the maximum depth of water that can be infiltrated within the required drain time (ft)

Choose thickness(es) of amended media and optional gravel storage layer and calculate total effective storage depth of the bioretention area ($d_{effective}$), as follows:

$$d_{effective} \leq (d_p + n_{media}^* l_{media} + n_{gravel} l_{gravel}) \quad (\text{Equation 6-8})$$

Where:

- $d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), including surface ponding and volume available in pore spaces of media and gravel layers
- d_p = surface ponding depth (ft), chosen using Equation 6-7
- n_{media}^* = available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions. This represents the volume of

available pore space as a fraction of the total soil volume; sometimes has units of (ft³/ft³) or described as a percentage.

l_{media} = thickness of amended soil media layer (ft), minimum 2 ft

n_{gravel} = porosity of optional gravel layer (ft/ft), approximately 0.40 ft/ft

l_{gravel} = thickness of optional gravel layer (ft)

- 3) Check that entire effective depth (surface plus subsurface storage), $d_{effective}$, infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96 \text{ hr} \quad (\text{Equation 6-9})$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), calculated using Equation 6-8

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 1).

If $t_{total} \leq 96$ hrs, then proceed to 5).

- 4) Calculate required infiltrating surface area, (A_{req}):

$$A_{req} = \frac{SQDV}{d_{effective}} \quad (\text{Equation 6-10})$$

Where:

A_{req} = required infiltrating area (ft²). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

$SQDV$ = stormwater quality design volume (ft³)

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), calculated using Equation 6-8

- 5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

- 1) Bioretention areas shall be sized to capture and treat the stormwater quality design volume (See Section 2 and Appendix E for calculating SQDV) with an 18-inch maximum ponding depth. *The intention is that ponding depth be limited to a depth that will allow for a health vegetation layer.*
- 2) Minimum planting soil depth should be 2 feet, although 3 feet is preferred. *The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV.*
- 3) A gravel storage layer below the bioretention soil media to promote infiltration into the native soil is optional.
- 4) Bioretention should be designed to drain below the planting soil in less than 48 hours and completely drain in less than 96 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity needed to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.*

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

- 1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.
- 2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.
- 3) Curb cuts for roadside or parking lot areas: curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and it should provide a settling area and periodic sediment removal of coarse material before flow dissipates to the remainder of the cell.
- 4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Overflow

An overflow device is required at the 18-inch ponding depth. The following, or equivalent should be provided:

- 1) A vertical PVC pipe (SDR 35) to act as an overflow riser.
- 2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe.

The inlet to the riser should be at the ponding depth (18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued, i.e., not removable.

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

- 1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.
- 2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.
- 3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

- 4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:
- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
 - Organic matter: 35-75% dry weight basis.
 - Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
 - Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
 - Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - $\text{NH}_4:\text{NH}_3 < 3$
 - Ammonium < 500 ppm, dry weight basis
 - Seed Germination > 80% of control
 - Plant trials > 80% of control

- Solvita® > 5 index value
- Nutrient content:
 - Total Nitrogen content 0.9% or above preferred
 - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range (“minimum” column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

- 5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity.*

Plants

- 1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

- 2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- 3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

- 1) Watering: Plants should be drought-tolerant. Watering may be required during prolonged dry periods after plants are established.
- 2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems, except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- 3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.
- 4) Nutrients and pesticides: The soil mix and plants should be selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.
- 5) Mulch: Replace mulch annually in bioretention facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal

deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

- 6) Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. Replacing mulch in bioretention facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

INF-4: Drywell

A dry well is defined as a bored, drilled, or driven shaft or hole whose depth is greater than its width. A dry well is designed specifically for flood alleviation and stormwater disposal. Drywells are similar to infiltration trenches in their design and function, as they are designed to temporarily store and infiltrate runoff, primarily from rooftops or other impervious areas with low pollutant loading. A dry well may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment.

Dry wells can be used to reduce the increased volume of stormwater runoff caused by roofs of buildings. While generally not a significant source of runoff pollution, roofs are one of the most important sources of new or increased runoff volume from land development sites. Dry wells can also be used to indirectly enhance water quality by reducing the amount of SQDV to be treated by the other, downstream stormwater management facilities.



Drywell installation

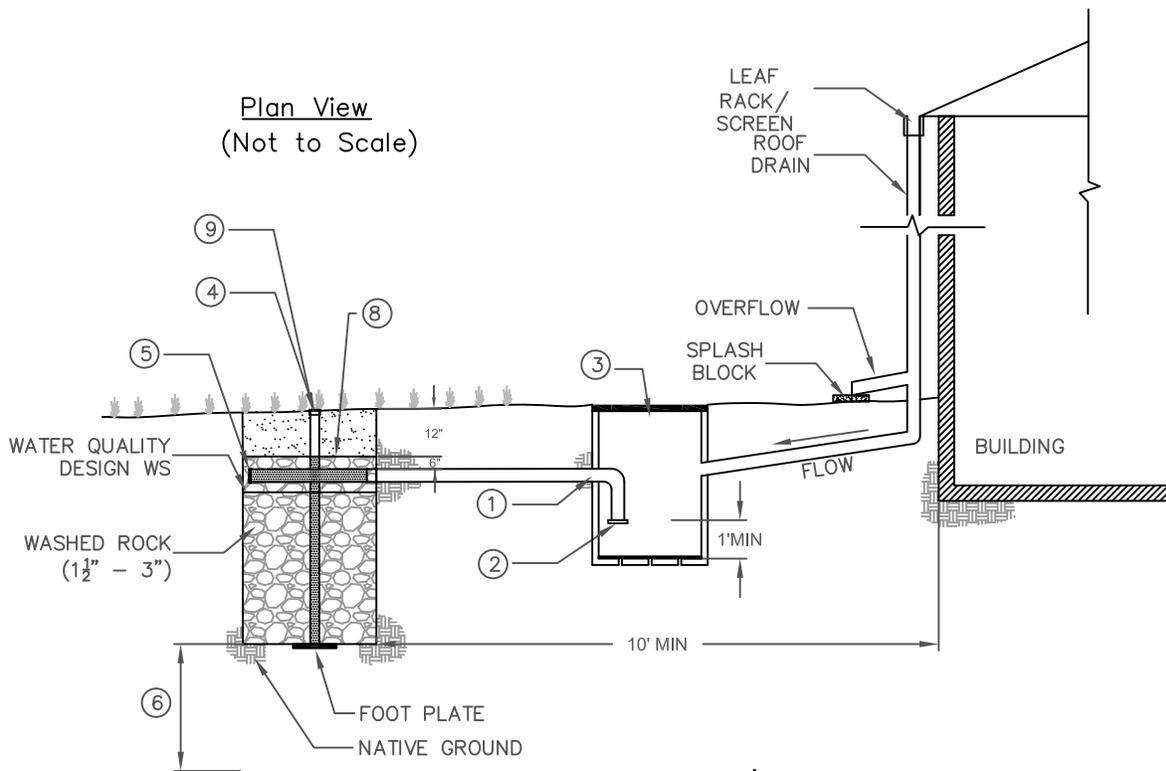
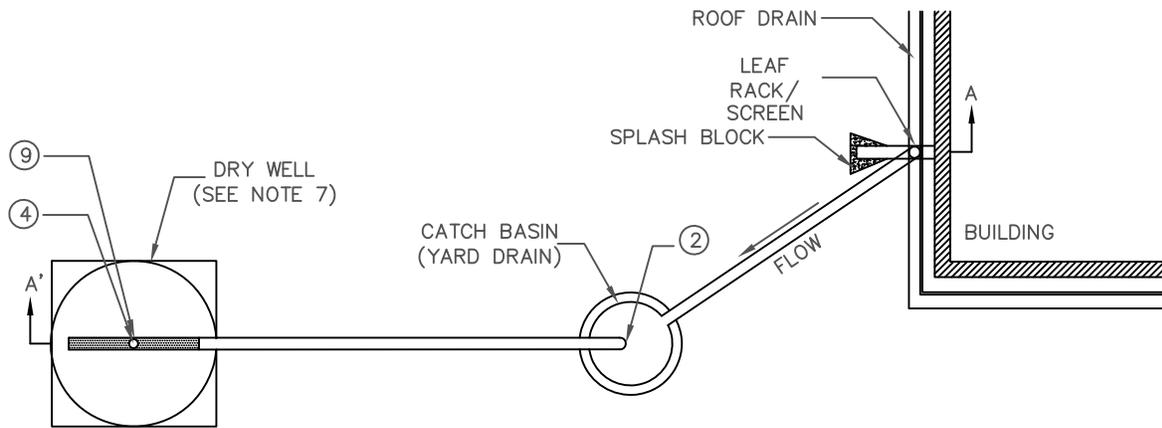
Photo Credits: 1. K&A Enterprises; 2. Canale Landscaping

Application

- Infiltration of roof runoff

Preventative Maintenance

- Remove trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Inspect for mosquito breeding



NOTES:

- ① MINIMUM 4" – 6" DIAMETER PVC PIPE. INSTALL AT FLAT SLOPE.
- ② INSTALL FINE MESH SCREEN AT INLET TO DRY WELL. SET INLET ELEVATION AT 1' MINIMUM ABOVE CATCH BASIN BOTTOM.
- ③ CATCH BASIN (YARD DRAIN) INSTALLED WITH A SOLID LID FLUSH WITH GROUND SURFACE.
- ④ 4–6" VERTICAL PERFORATED PVC INSPECTION WELL WITH SCREW LID (NUT DOWN) FLUSH WITH GROUND SURFACE.
- ⑤ CAP END OF 4–6" HORIZONTAL PERFORATED PVC DISPERSION PIPE.
- ⑥ MINIMUM 10' ABOVE SEASONAL HIGH GROUNDWATER TABLE AND 3' ABOVE BEDROCK.
- ⑦ DRY WELL CONFIGURATION MAY VARY (E.G. PRE-FAB MAY BE CIRCULAR).
- ⑧ CHOKING STONE LAYER SHALL BE PLACED ON TOP OF THE DRY WELL TO SEPARATE IT FROM THE TOPSOIL AND PREVENT CLOGGING.



Figure 6-5: Drywell

Limitations

The following limitations shall be considered before choosing to use a dry well:

- Native soil infiltration rate – soil permeability at the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected from pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- Dry wells cannot receive untreated stormwater runoff, except rooftop runoff. Pretreatment of runoff from other surfaces is necessary to prevent premature failure that results from clogging with fine sediment, and to prevent potential groundwater contamination due to nutrients, salts, and hydrocarbons.

- Infiltration structures cannot be used to treat runoff from portions of the site that are not stabilized.
- Rehabilitation of failed dry wells requires complete reconstruction.

Design Criteria

The main challenge associated with drywells, as with infiltration trenches, is the prevention of system clogging and subsequent infiltration inhibition. Drywells should be designed according to the requirements listed in Table 6-10 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-10: Infiltration BMP Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Design drawdown time	hour	12
Pretreatment	-	BIO-3: Vegetated Swale , BIO-4: Filter Strip , proprietary device, or equivalent.
Design percolation rate (k_{design})	in/hr	Shall be corrected for testing method, potential for clogging and compaction over time, and facility geometry.
Maximum depth of facility (d_{max})	feet	Defined by the design infiltration rate and the design drawdown time (includes depth of media).
Surface area of facility (A)	ft ²	Based on depth of dry well media.
Facility geometry	-	Geometry varies; max 10 feet deep; flat bottom slope.
Filter media diameter	inches	1.5 – 3 (gravel); prefabricated media may also be used
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist on site to allow the construction of a properly functioning infiltration facility.

- 1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully-treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.
- 2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Measurements of groundwater levels must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).
- 3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed drywell;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, “Determine the design percolation rate,” in the INF-1: Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
 - Provide a written opinion by a professional civil engineer describing whether the drywell will compromise slope stability; and
 - Identify potential impacts to nearby structural foundations.

Setbacks

- 1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

- 2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- 3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

- A removable filter with a screened bottom should be installed in the roof leader below the surcharge pipe in order to screen out leaves and other debris.
- Though roofs are generally not a significant source of runoff pollution, they can still be source of particulates and organic matter. Measures such as roof gutter guards, roof leader clean-out with sump, or an intermediate sump box can provide pretreatment for dry wells by minimizing the amount of sediment and other particulates that may enter it.

Sizing Criteria

See [Sizing Criteria](#) section in the INF-1: Infiltration Basin fact sheet.

Geometry and Sizing

- 1) Dry well configurations vary, but generally they have length and width dimensions closer to square than infiltration trenches. Pre-fabricated dry-wells are often circular. The surface area of the dry well must be large enough to infiltrate the storage volume in 12 hours based on the maximum depth allowable (d_{max}).
- 2) The filter bed media layers are the same as for infiltration trenches unless prefabricated dry wells and/or media are used. The porosity of gravel media systems is generally 30 to 40% and is 80 to 95% for prefabricated media systems.
- 3) If a dry well receives runoff from an underground pipe (i.e., runoff does not enter the top of the dry well from the ground surface), a fine mesh screen should be installed at the inlet. The inlet elevation should be 18 inches below the ground surface (i.e., below 12 inches of surface soil and 6 inches of dry well media).
- 4) An observation well should be installed to check for water levels, drawdown time, and evidence of clogging. A typical observation well consists of a slotted PVC well screen, 4 to 6 inches in diameter, capped with a lockable, above-ground lid.

Drainage

- 1) The bottom of infiltration bed must be native soil, over-excavated to at least one foot in depth and replaced uniformly without compaction. Amending the excavated soil with 2 to 4 inches (~15% to 30%) of coarse sand is recommended.

- 2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure a maximum 12 hr drawdown time. An observation well should be incorporated to allow observation of drain time.

Emergency Overflow

- 1) There must be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.
- 2) The overflow channel must be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

Vegetation

- 1) Drywells should be kept free of vegetation.
- 2) Trees and other large vegetation should be planted away from drywells such that drip lines do not overhang infiltration beds.

Maintenance Access

- 1) The facility and outlet structures must all be safely accessible during wet and dry weather conditions.
- 2) Maintenance access is required.
- 3) If the drywell becomes plugged and fails, then access is needed to excavate the facility to remove and replace the top layer and the filter bed media of the structure. To prevent damage and compaction, access must be able to accommodate a backhoe working at “arms length”.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines should be specified:

- 1) The entire area draining to the facility must be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entering during construction.
- 2) Drywells should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Drywells should not be used as sediment control facilities.
- 3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility

cannot be avoided, the infiltration capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

- 4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Drywell maintenance should be performed frequently to ensure that water infiltrates into the subsurface completely within the recommended infiltration time (or drain time if a drywell receives runoff from an underground pipe) of 72 hours or less after a storm.

Maintenance and regular inspections are important for the proper function of drywells. A specific maintenance plan shall be developed specifically for each facility outlining the schedule and scope of maintenance operations, documentation, and reporting requirements.

INF-5: Permeable Pavement

Permeable pavements contain small voids that allow water to pass through to a stone base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or a poured-in-place solution (porous concrete or permeable asphalt). All permeable pavements with a stone reservoir base treat stormwater and remove sediments and metals to some degree. While conventional pavement result in increased rates and volumes of surface runoff, porous pavements when properly constructed and maintained, allow some of the stormwater to percolate through the pavement and enter the soil below. This facilitates groundwater recharge while providing the structural and functional features needed for the roadway, parking lot, or sidewalk. The paving surface, subgrade, and installation requirements of permeable pavements are more complex than those for conventional asphalt or concrete surfaces. For porous pavements to function properly over an expected life span of 15 to 20 years, they must be properly sited and carefully designed and installed, as well as periodically maintained. Failure to protect paved areas from construction-related sediment loads can result in their premature clogging and failure. Note that the 2011 TGM does not provide specific instructions on how to design and construct pavement.



Application

- Parking lots
- Driveways
- Sidewalks and walkways
- Outdoor athletic courts

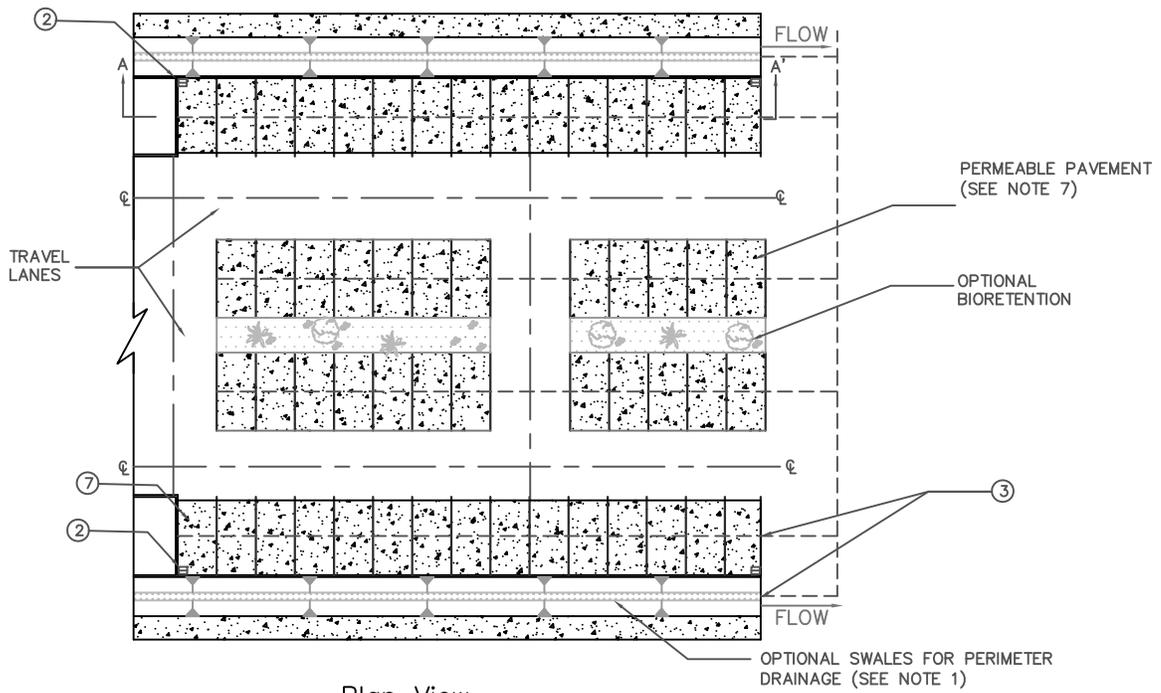


Preventative Maintenance

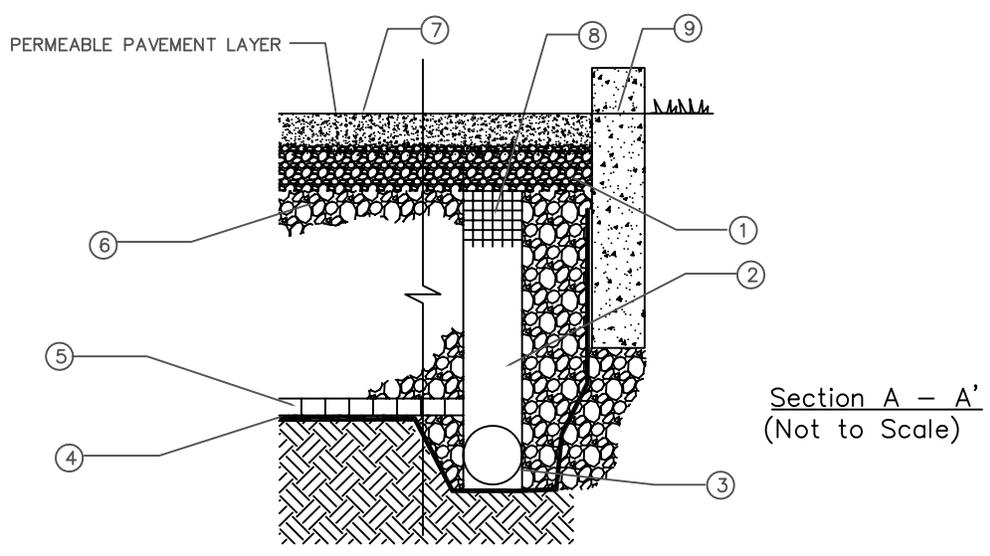
- Trash removal
- Post-rain inspections
- Vacuum sweeping
- Vegetation inspection and removal

Permeable pavement applications

Photo Credits: 1. Geosyntec Consultants; 2. EPA Stormwater Management



Plan View
(Not to Scale)



Section A - A'
(Not to Scale)

NOTES:

- ① BEDDING COURSE SHALL BE 1½" TO 3" MIN THICKNESS (TYP NO. 8 AGGREGATE).
- ② OPTIONAL OVERFLOW PIPE(S) SHALL BE PROVIDED IF OVERFLOWS ARE NOT MANAGED VIA PERIMETER DRAINAGE TO SWALES, BIORETENTION OR STORM WATER CONVEYANCE SYSTEM INLETS.
- ③ CONNECT OUTFALL PIPES TO DOWNSTREAM STORMWATER CONVEYANCE SYSTEM. OUTFALL PIPES SHALL BE SLOPED TOWARDS COLLECTION SYSTEM.
- ④ SOIL SUBGRADE SHALL HAVE ZERO SLOPE.
- ⑤ INSTALL GEOTEXTILE OR CHOKING LAYER ON BOTTOM & SIDES OF OPEN-GRADED BASE FOR FULL AND PARTIAL INFILTRATION, OR AN IMPERMEABLE LINER FOR NO INFILTRATION.
- ⑥ OPEN-GRADED BASE. THICKNESS AND GRADATION VARIES WITH DESIGN. TYP. NO. 57 AGGREGATE OR 4" THICK NO. 57 OVER NO. 2 STONE SUBBASE. THICKNESS OF SUB-BASE VARIES WITH DESIGN.
- ⑦ PERMEABLE PAVEMENT INFILTRATIVE LAYER
- ⑧ OPTIONAL RIGID PLASTIC SCREEN FASTENED OVER OVERFLOW INLETS.
- ⑨ CURB/EDGE RESTRAINT WITH CUT-OUTS FOR OVERFLOW DRAINAGE TO PERIMETER BMPS, STORMWATER CONVEYANCE SYSTEM INLETS OR OPTIONAL OVERFLOW PIPES.
- ⑩ PARTIAL EXFILTRATION THROUGH THE SOIL. PERFORATED PIPES DRAIN EXCESS RUNOFF THAT CAN NOT BE ABSORBED BY SLOW-DRAINING SOIL.



Figure 6-6: Permeable Pavement

Limitations

The following describes limitations for the use of permeable pavement.

- Native soil infiltration rate - permeability of soils at the BMP location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other infiltration barrier to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near a service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risk areas are isolated from stormwater runoff, or infiltration areas that have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- Permeable pavement cannot receive untreated stormwater runoff from other surfaces. Pretreatment of run-on from other surfaces is necessary to prevent premature failure that results from clogging with fine sediment.

- Permeable pavement cannot be used to treat runoff from portions of the site that are not stabilized.

Design Criteria

Permeable pavement should be designed according to the requirements listed in Table 6-11 and outlined in the section below.

Table 6-11: Permeable Pavements Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater Quality Design Volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Pretreatment	-	Runoff from pervious areas should be minimized but, if provided, BIO-3: Vegetated Swale or BIO-4: Filter Strip should be provided for all runoff from offsite sources that are not directly adjacent to the permeable pavement.
Drawdown time of gravel drainage layer	hrs	12 - 72
Porous Pavement Infill		ASTM C-33 sand or equivalent
Minimum depth to bedrock	ft	2 (without underdrains)
Minimum depth to seasonal high water table	ft	2 (with underdrains); 10 (without underdrains)
Infiltration rate of subsoil	in/hr	1.0 (minimum without an underdrain)
Overflow device	-	Required

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

- 1) Infiltration facilities require a minimum native soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality.

Pretreatment for removing coarse sediment present in runoff from the tributary area is required in all instances.

- 2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Groundwater levels measurements must be made during the time when the water level is expected to be at a maximum (i.e., toward the end of the wet season).
- 3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed permeable pavement;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, “Determine the design percolation rate,” in the Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
 - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and
 - Identify potential impacts to nearby structural foundations.

Setbacks

- 1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.
- 2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- 3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

- 1) Depending on how and where permeable pavements will be used, pretreatment of the runoff entering the permeable pavement may be necessary. This is particularly important when the permeable pavement will be accepting run-on from pervious areas or areas that are not completely stabilized. If this is the case, then the run-on should be treated prior to contacting the permeable pavement. Without adequate pretreatment, the life of the permeable pavement may be significantly decreased.
- 2) If sheet flow is conveyed to the permeable pavement over stabilized grassed areas, the site must be graded in such a way that minimizes erosive conditions.

Sizing Criteria

Permeable pavement must be designed to meet Ventura County codes and/or applicable local permitting authority codes. These sizing criteria are meant to provide guidance for runoff volume storage only.

Step 1: Calculate the Design Volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see [Section 2](#) and Appendix E) with a 12 to 72 hour drawdown time (see Appendix D, Section D.2).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils and not the percolation rate of the filter media bed (refer to the [“Geometry and Sizing”](#) section of INF-2 for the recommended composition of the filter media bed for infiltration trenches).

Considerations for Design Percolation Rate Corrections

Suitability assessment related considerations include (Table 6-12):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate

average properties resulting in a higher level of uncertainty associated with initial estimates.

- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table 6-12: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 ($f = 0.5 - 0.64$)	4 or 5 ($f = 0.65 - 0.91$)	6 or 7 ($f = 0.92$ or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88) which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Design related considerations include (Table 6-13):

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.
- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.
- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.

Compaction during construction – proper construction oversight is needed during construction to ensure that the bottom of the infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-13: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors, using the worksheet shown in Table 6-14 below. The design percolation rate would be determined as follows:

- For each consideration shown in Table 6-12 and Table 6-13 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns assign a factor value of 3, for medium concerns assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.

- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-14: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \sum p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \sum p$			
Combined Safety Factor = $S_A \times S_B$					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Determine the Gravel Drainage Layer Depth

Permeable pavement (including the base layers) should be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

- 1) Calculate the maximum depth of runoff (d_{max}) that can be infiltrated within the drawdown time:

$$d_{max} = \frac{P_{design} \cdot t}{12} \tag{Equation 6-11}$$

Where:

d_{max} = maximum depth that can be infiltrated (ft)

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

t = drawdown time (12-72 hours) (hr)

2) Select the gravel drainage layer depth, (l), such that:

$$d_{max} \geq n \times l \quad \text{(Equation 6-12)}$$

Where:

d_{max} = maximum depth that can be infiltrated (ft) (see 1) above)

n = gravel drainage layer porosity(unitless)(generally about 40% or 0.40 for gravel)

l = gravel drainage layer depth (ft)

Step 4: Determine infiltrating surface area

3) Calculate infiltrating surface area for permeable pavement (A):

$$A = \frac{SQDV}{\frac{TP_{design}}{12} + nl} \quad \text{(Equation 6-13)}$$

Where:

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

n = gravel drainage layer porosity(unitless)[about 40% or 0.40 for gravel]

l = depth of gravel drainage layer (ft)

T = time to fill the gravel drainage layer with water (use 2 hours for most designs) (hr)

Geometry and Size

1) Permeable pavement shall be sized to capture and treat the stormwater quality design volume (SQDV).

2) Pavement design options include:

- a. Full or partial infiltration – A design for full infiltration uses an open graded base for maximum infiltration and storage of stormwater. The water infiltrates directly into the base and through the soil. Pipes may provide drainage in overflow conditions. Partial infiltration does not rely completely on infiltration through the soil to dispose all of the captured runoff. Some of the water may infiltrate into the soil and the remainder drained by pipes.
 - b. No infiltration – No infiltration is desirable when the soil has low permeability and low strength, or there are other site limitations. An underdrain should be provided if the depth to bedrock is less than 2 feet or the depth to the water table is less than 10 feet. By storing water for a time in the base and then slowly releasing it through pipes, the design behaves like an underground detention pond. In other cases, the soil of the sub-base may be compacted and stabilized to render improved support for vehicular loads. This practice reduces infiltration into the soil to nearly zero. The “no infiltration” option requires the use of geotextile and bedding between the pavement and the open graded base.
- 3) If permeable pavement is located on a site with a slope greater than 2%, the permeable pavement area should be terraced to prevent lateral flow through the subsurface. Permeable pavement cannot be located on a site with a slope greater than 5%.
- 4) Porous pavement systems generally consist of at least four different layers of material:
- a. The top or wearing layer consists of either asphalt or concrete with a greater than normal percentage of voids (typically 12 to 20 percent in the case of asphalt). The wearing layer may also be comprised of lattice-type pavers (either hollow concrete blocks or paving stones made from solid conventional concrete or stone), which are set in a bedding material (sand, pea-sized gravel or turf grass).
 - b. Below the wearing layer, a stone reservoir layer or a thick layer of aggregate (e.g., 2 inch stone) provides the bulk of the water storage capacity for a porous pavement system. In the pavement design, it is important to ensure that this reservoir layer retains its load bearing capacity under saturated conditions, because it may take several days for complete drainage to occur.
 - c. Typically, porous pavement designs include two (or more) transition layers that can be constructed from 1 to 2 inch diameter stone. One transition layer separates the top wearing layer from the underlying stone reservoir layer. Another transition layer is used to separate the stone reservoir from the undisturbed subgrade soil. Some designs also add a geotextile layer to this bottom layer or some combination of stones and geotextiles.

- d. Porous asphalt pavement, for example, consists of open grade asphalt mixture ranging in depth from 2 to 4 inches with 16 percent voids. The thickness selected depends on bearing strength and pavement design requirements. This layer sits on a 2 to 4 inch transition layer located over a stone reservoir. The bottom layer completes the transition to the underlying undisturbed soil using a combination transition/filter fabric layer.
 - e. The depth of each layer should be determined by a licensed civil engineer based on analyses of the hydrology, hydraulics, and structural requirements of the site.
- 5) Modular paving stones are also used to create porous pavements. These pavements can be constructed in situ by pouring concrete into special frames or by using preformed blocks. The top layer of these porous pavements consists of conventional concrete, with the intervening void areas filled with either turf or sand. A transition or bedding layer is used to make the transition to the reservoir layer. These lattice-type pavers or hollow concrete blocks are often used in conjunction with turf grasses and are used in low-traffic parking lots, lanes, or driveways. Porous pavements using paving stones have similar construction, but can be designed to have a much higher load bearing capacity, and therefore have more widespread applicability. Construction guidelines and design specifications are available from the manufacturers of these products.
- 6) Permeable pavement (including the base layers) should be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate subsoil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.
- 7) The percolation rate will decline as the surface becomes occluded and particulates accumulate in the infiltration layer. It is important that adequate conservatism is incorporated in the selection of design percolation rates.

Overflow

An overflow mechanism is required. Two options are provided:

Option 1: Perimeter control

Flows in excess of the design capacity of the permeable pavement system will require an overflow system connected to a downstream conveyance or other stormwater runoff BMP. In addition, if the pavement becomes clogged and infiltration decreases to the point that there is ponding, runoff will migrate off of the pavement via overland flow instead of infiltrating into the subsurface gravel layer. There are several options for handling overflow using perimeter controls such as:

- 1) Perimeter vegetated swale.
- 2) Perimeter bioretention.
- 3) Storm drain inlets.
- 4) Rock filled trench that funnels flow around pavement and into the subsurface gravel layer.

Option 2: Overflow pipe(s)

- 1) A vertical pipe should be connected to the underdrain.
- 2) The diameter, location, and quantity may vary with design and should be determined by a licensed civil engineer.
- 3) The pipe should be located away from vehicular traffic.
- 4) The piping system may incorporate an observational and/or cleanout well.
- 5) The top of the overflow pipe should be covered with a screen fastened over the overflow inlet.

Construction Considerations

- 1) Permeable pavement should be laid close to level and the bottom of the base layers must be level to ensure uniform infiltration.
- 2) Permeable pavement surfaces should not be used to store site materials, unless the surface is well protected from accidental spillage or other contamination.
- 3) To prevent/minimize soil compaction in the area of the permeable pavement installation, use light equipment with tracks or oversized tires.
- 4) Divert stormwater from the area as needed (before and during installation).
- 5) The pavement should be the last installation done at a development site. Landscaping should be completed and adjacent areas stabilized, before pavement installation to minimize the risk of clogging.
- 6) Vehicular traffic should be prohibited for at least 2 days after installation.

Operations and Maintenance

Permeable pavement mainly requires vacuuming and management of adjacent areas to limit sediment contamination and prevent clogging by fine sediment particles. Therefore, little special training is needed for maintenance crews. The following maintenance concerns and maintenance activities shall be considered and provided:

- 1) Trash tends to accumulate in paved areas, particularly in parking lots and along roadways. The need for litter removal should be determined through periodic inspection.
- 2) Regularly (e.g., monthly for a few months after initial installation, then quarterly) inspect pavement for pools of standing water after rain events, this could indicate surface clogging.
- 3) Actively (3 to 4 times per year, or more frequently depending onsite conditions) vacuum sweep the pavement to reduce the risk of clogging by frequently removing fine sediments before they can clog the pavement and subsurface layers. This also helps to prolong the functional period of the pavement.
- 4) Inspect for vegetation growth on pavement and remove when present.
- 5) Inspect for missing sand/gravel in spaces between pavers and replace as needed.
- 6) Activities that lead to ruts or depressions on the surface should be prevented or the integrity of the pavement should be restored by patching or repaving. Examples are vehicle tracks and utility maintenance.
- 7) Spot clogging of porous concrete may be remedied by drilling 0.5 inch holes every few feet in the concrete.
- 8) Interlocking pavers that are damaged should be replaced.
- 9) Maintain landscaped areas and reseed bare areas.

INF-6: Proprietary Infiltration

A number of vendors offer proprietary infiltration products that allow for similar or enhanced rates of infiltration and subsurface storage while offering durable prefabricated structures. There are many varieties of proprietary infiltration BMPs.



Application

- Mixed-use and commercial
- Roads and parking lots
- Parks and open spaces
- Single and multi-family residential

Routine Maintenance

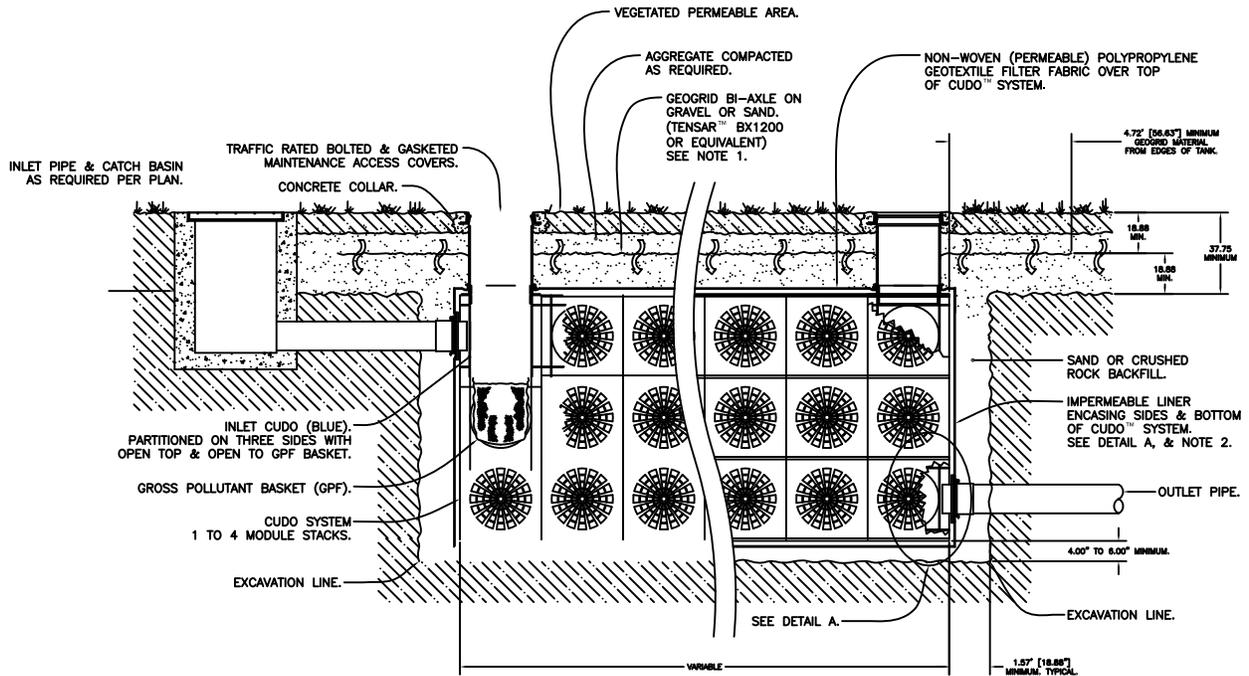
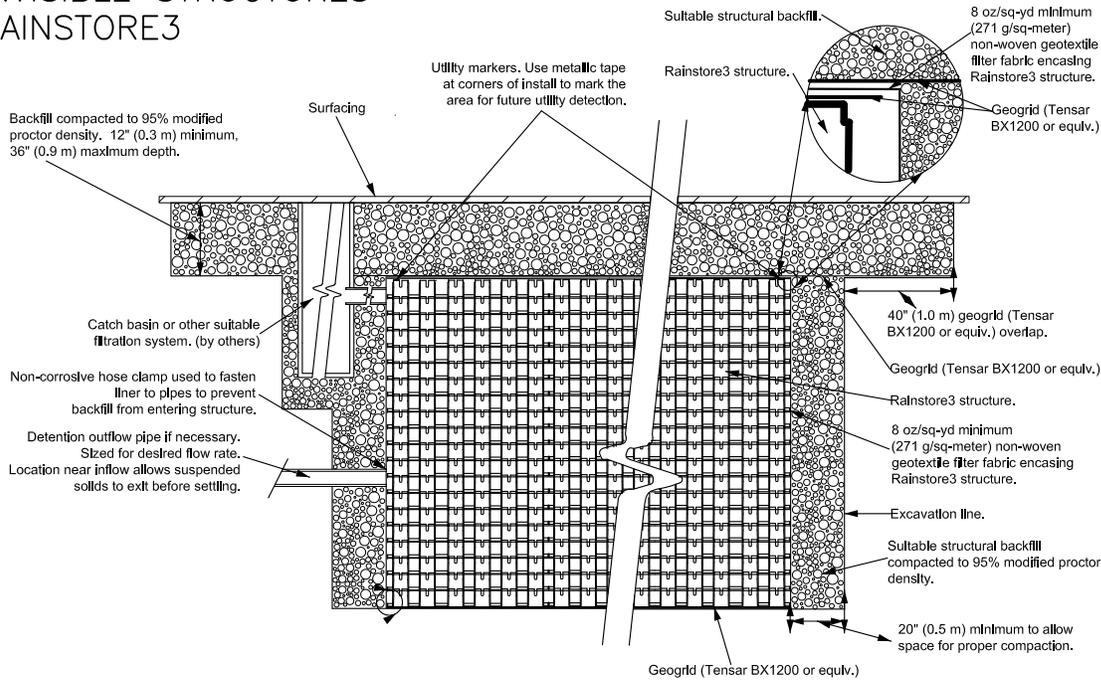
- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Inspect for mosquito breeding



Proprietary Infiltration BMPs

Photo Credits: 1. & 2. Contech Stormwater Solutions, Inc.

INVISIBLE STRUCTURES RAINSTORE3



SECTION / CUTAWAY VIEW
SCALE: NONE

CUDO CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

Geosyntec[®]
consultants

Figure 6-7: Proprietary Infiltration BMPs

Limitations

The following limitations shall be considered before choosing to use an infiltration BMP:

- Native soil infiltration rate - soil permeability of the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Table 6-15: Proprietary Infiltration Manufacturer Websites

Device	Manufacturer	Website
A-2000™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
ChamberMaxx™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CON/SPAN Vaults™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CON/Storm™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
Perforated Corrugated Metal Pipe (CMP)	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
Drywell StormFilter	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CUDO® Water Storage System	KriStar Enterprises Inc.	www.kristar.com
D-Raintank® Matrix Tank Modules	Atlantis®	www.atlantis-america.com
EcoRain™ Modular Rain Tank	EcoRain Systems Inc.	www.ecorain.com
Landmax®	Hancor®	www.hancor.com
Landsaver™	Hancor®	www.hancor.com
Precast Concrete Dry Well	Jensen Precast®	www.jensenprecast.com
Rainstore ³	Invisible Structures Inc.	www.invisiblestructures.com
StormChambers™	Hydrologic Solutions, Inc.	www.hydrologicsolutions.com
Stormtech® SC-740 and SC-310 Chambers	StormTech LLC	www.stormtech.com
StormTrap®	StormTrap	www.stormtrap.com
Triton Chambers™	Triton Stormwater Solutions	www.tritonsws.com

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

- 1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour such that pollutant removal may not be adequate to protect groundwater quality, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.
- 2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Measurements of groundwater levels must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).
- 3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed proprietary infiltration BMP.;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, “Determine the design percolation rate,” in the Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
 - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and
 - Identify potential impacts to nearby structural foundations.

Setbacks

- 1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.
- 2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

- 3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

Pretreatment is required for proprietary infiltration BMPs in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of sediment particles before runoff reaches a management practice. This eases the long-term maintenance burden and likelihood of failure. Pretreatment is important for most stormwater treatment BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins, sedimentation manholes and hydrodynamic separation devices. The use of at least two pretreatment devices is highly recommended for infiltration BMPs.

Sizing

- 1) Proprietary infiltration BMPs shall be sized to capture and treat the stormwater quality design volume (SQDV). See Section 2 and Appendix E for calculating for further detail.
- 2) The percolation rate will decline as the surface becomes occluded and particulates accumulate in the infiltrative layer. It is important that adequate conservatism is incorporated in the selection of design percolation rates.
- 3) For the sizing guidelines, refer to the manufacturer's website.

Operations and Maintenance

See vendor's website for maintenance requirements.

INF-7: Bioinfiltration

Bioinfiltration facilities are designed for partial infiltration of runoff and partial biotreatment. These facilities are similar to bioretention devices with underdrains, but the underdrain is raised above the gravel sump to facilitate infiltration. These facilities can be used in areas where there are no hazards associated with infiltration, but infiltration of the full DCV may not be feasible due to low infiltration rates (Soil Type 3) or high depths of fill. These facilities may not result in retention of the DCV but they can be used to meet the MEP standards.



Bioretention in Parkway and parking lots

Photo Credits: Geosyntec Consultants

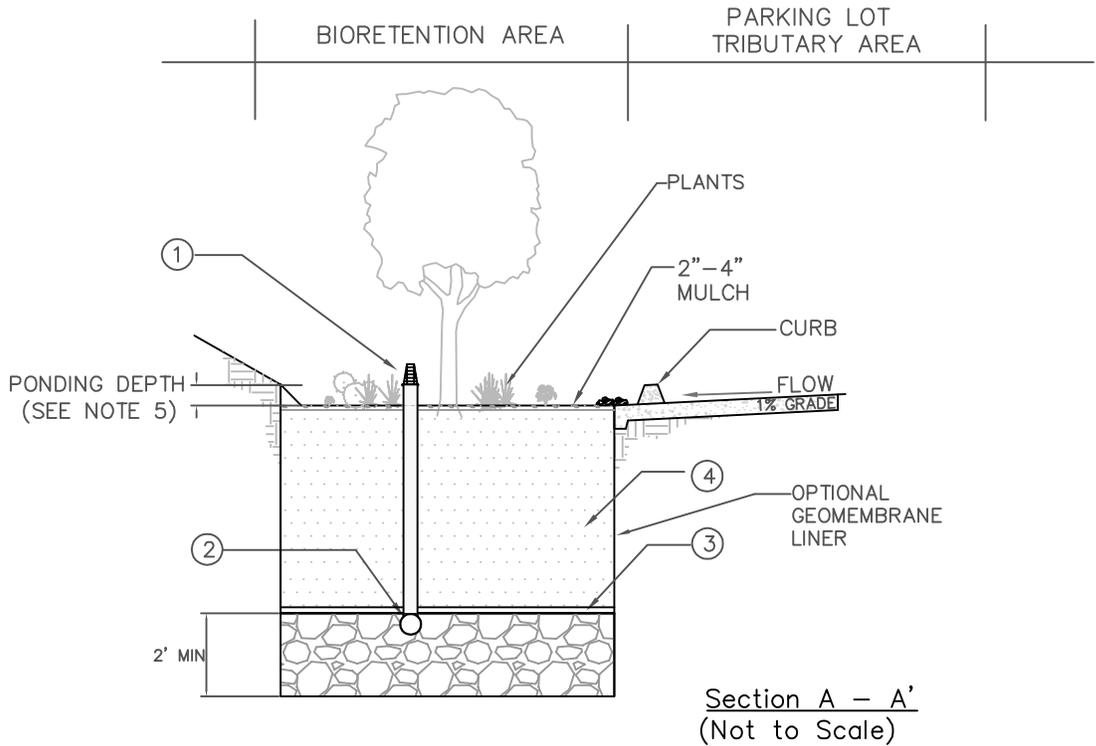
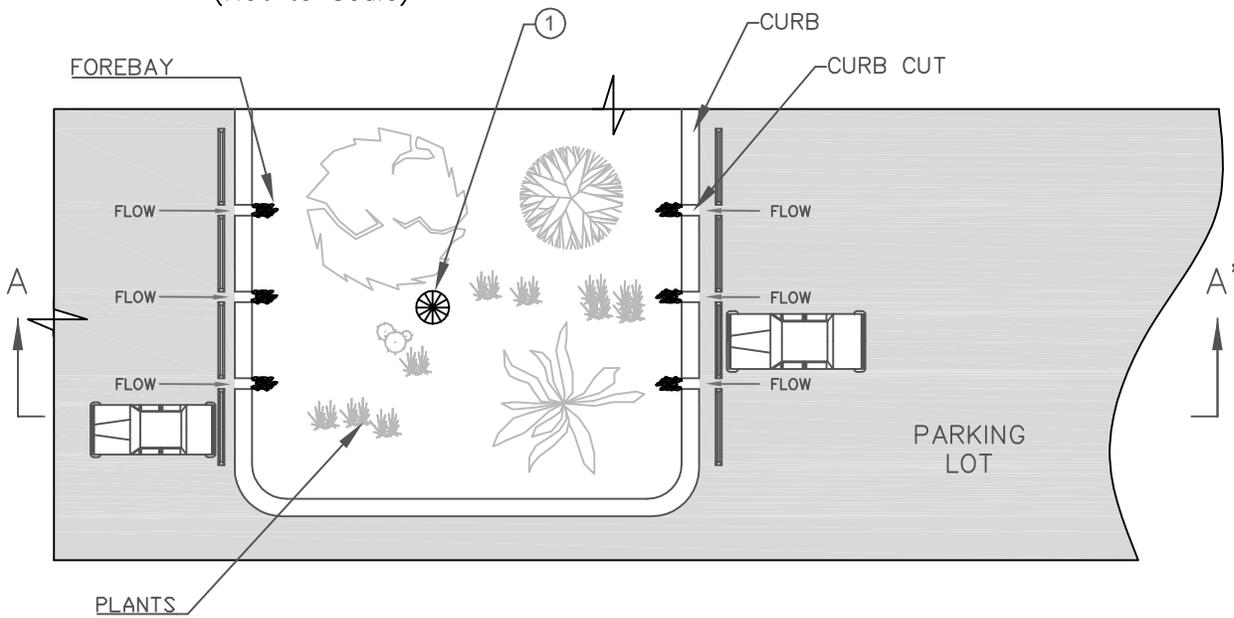
Application

- Commercial, residential, mixed use, institutional, and recreational uses
- Parking lot islands, traffic circles
- Road parkways & medians

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

Plan View
(Not to Scale)



NOTES:

- ① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
- ② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
- ③ OPTIONAL CHOKING GRAVEL LAYER.
- ④ 2' MIN PLANTING MIX; 3' PREFERRED.
- ⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.
- ⑥ 2' MIN GRAVEL LAYER DEPTH.



Figure 6-8: Bioinfiltration

Limitations

The following limitations should be considered before choosing to use bioinfiltration:

- 1) Native soil infiltration rate - soil permeability at the bioinfiltration location must be no less than 0.3 inches per hour.
- 2) Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment through the soils before it reaches the groundwater.
- 3) Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- 4) Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- 5) Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
- 6) Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.
- 7) High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risk areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- 8) High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- 9) Vertical relief and proximity to storm drain - site must have adequate relief between the land surface and storm drain to permit vertical percolation through the soil media and collection.

Design Criteria

Bioinfiltration should be designed according to the requirements listed in Table 6-16 and outlined in the section below.

Table 6-16: Bioretention Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	48
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18
Minimum thickness of amended soil	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	Underdrain should be installed below the choking stone; 6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide capacity for maximum rate filtered through amended media
Minimum thickness of gravel layer	feet	2
Overflow device	-	Required

Sizing Criteria

Bioinfiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 96 hours (including subsurface pore space), and surface ponding must be infiltrated within 48 hours. The simple sizing procedure is provided below. For the routing modeling method, refer to [TCM-4 Sand Filters](#).

Step 1: Calculate the Design Volume

Bioinfiltration facilities shall be sized to capture and partially infiltrate and partially biotreat the SQDV volume (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate through the BMP and to the subsurface will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For bioinfiltration facilities, the design percolation rate discussed here is the adjusted percolation rate of the underlying soils and not the percolation rate of the filter media bed. The measured short-term infiltration rate should be adjusted using a factor of safety of 2.0.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

- 1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time (48 hr), (d_{max}), as follows:

$$d_{max} = \frac{P_{design} \times t_{ponding}}{12 \frac{in}{ft}} \quad \text{(Equation 6-14)}$$

Where:

- | | | |
|---------------|---|---|
| $t_{ponding}$ | = | required drain time of surface ponding (48 hrs) |
| P_{design} | = | design percolation rate of underlying soils (in/hr) (see Step 2, above) |

d_{max} = the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft), calculated using Equation 6-14

2) Choose surface ponding depth (d_p) such that:

$$d_p \leq d_{max} \quad \text{(Equation 6-15)}$$

Where:

d_p = selected surface ponding depth (ft)

d_{max} = the maximum depth of water that can be infiltrated within the required drain time (ft)

Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of the bioinfiltration area ($d_{effective}$), as follows:

$$d_{effective} \leq (d_p + n_{media}^* l_{media} + n_{gravel} l_{gravel}) \quad \text{(Equation 6-16)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), including surface ponding and volume available in pore spaces of media and gravel layers

d_p = surface ponding depth (ft), chosen using Equation 6=15

n_{media}^* = available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions. This represents the volume of available pore space as a fraction of the total soil volume; sometimes has units of (ft³/ft³) or described as a percentage.

l_{media} = thickness of amended soil media layer (ft), minimum 2 ft

n_{gravel} = porosity of gravel layer (ft/ft), approximately 0.40 ft/ft

l_{gravel} = thickness of gravel layer (ft), minimum 2 ft

3) Check that entire effective depth (surface plus subsurface storage), $d_{effective}$, infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96 \text{ hr} \quad (\text{Equation 6-17})$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), calculated using Equation 6-16

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 1).

If $t_{total} \leq 96$ hrs, then proceed to 5).

- 4) Calculate required infiltrating surface area, (A_{req}):

$$A_{req} = \frac{SQDV}{d_{effective}} \quad (\text{Equation 6-18})$$

Where:

A_{req} = required infiltrating area (ft²). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

$SQDV$ = stormwater quality design volume (ft³)

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), calculated using Equation 6-16

- 5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

- 1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

- 2) Minimum gravel layer depth is 2 feet.

The intention is that the gravel sump provides partial retention of captured water.

- 3) Bioinfiltration should be designed to drain below the planting soil in less than 48 hours and completely drain from the gravel layer in 96 hours (both starting from the end of inflow).

The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioinfiltration cells:

- 1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.
- 2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.
- 3) Curb cuts for roadside or parking lot areas: curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and it should provide a settling area and periodic sediment removal of coarse material before flow dissipates to the remainder of the cell.
- 4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

- 1) 6-inch minimum diameter.
- 2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

- 3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.
- 4) Underdrains should be sloped at a minimum of 0.5%.
- 5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioinfiltration facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

Gravel Layer

- 1) The following aggregate should be used for the gravel layer below the underdrain pipe. Place the underdrain below the choking stone, within the top 6 inches of the gravel layer.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

- 2) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the gravel layer. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft², should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate (choking stone) should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches

of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

- 3) Bioinfiltration facilities have the added benefit of enhanced nitrogen removal due to the elevated underdrain. This allows for a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO₂ and NO₃) instead of oxygen for respiration.*
- 4) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioinfiltration cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for harvesting.

Overflow

An overflow device is required at the 18-inch ponding depth. The following, or equivalent should be provided:

- 1) A vertical PVC pipe (SDR 35) to act as an overflow riser.
- 2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe.

The inlet to the riser should be at the ponding depth (18 inches for fenced bioinfiltration areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued, i.e., not removable.

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

- 1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioinfiltration soil shall also support vigorous plant growth.
- 2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

- 3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioinfiltration should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

- 4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:
- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
 - Organic matter: 35-75% dry weight basis.
 - Carbon and Nitrogen Ratio: $15:1 < C:N < 25:1$
 - Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.

- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - $\text{NH}_4:\text{NH}_3 < 3$
 - Ammonium < 500 ppm, dry weight basis
 - Seed Germination $> 80\%$ of control
 - Plant trials $> 80\%$ of control
 - e. Solvita® > 5 index value
- Nutrient content:
 - Total Nitrogen content 0.9% or above preferred
 - Total Boron should be < 80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioinfiltration should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioinfiltration media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range (“minimum” column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioinfiltration media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

- 5) The bioinfiltration area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity.*

Planting/Storage Media Design for Nutrient Sensitive Receiving Waters

- 1) Where the BMP discharges to receiving waters with nutrient impairments or nutrient TMDLs, the planting media placed in the cell should be designed with the specific goal of minimizing the potential for initial and long term leaching of nutrients from the media.
- 2) In general, the potential for leaching of nutrients can be minimized by:
 - a. Utilizing stable, aged compost (as required of media mixes under all conditions).
 - b. Utilizing other sources of organic matter, as appropriate, that are safe, non-toxic, and have lower potential for nutrient leaching than compost.
 - c. Reducing the content of compost or other organic material in the media mix to the minimum amount necessary to support vigorous plant growth and healthy biological processes.
- 3) A landscape architect should be consulted to assist in the design of planting/storage media to balance the interests of plant establishment, water retention capacity (irrigation demand), and the potential for nutrient leaching. The following practices should be considered in developing the media mix design:
 - a. The actual nutrient content and organic content of the selected compost source should be considered when specifying the proportions of compost and sand. The compost specification allows a range of organic content over approximately a factor of 2 and nutrient content may vary more widely. Therefore determining the actual organic content and nutrient content of the compost expected to be supplied is important in determining the proportion to be used for amendment.
 - b. A commitment to periodic soil testing for nutrient content and a commitment to adaptive management of nutrient levels can help reduce the amount of organic amendment that must be provided initially. Generally, nutrients can be added planting areas through the addition of organic mulch, but cannot be removed.
 - c. Plant palettes and the associated planting mix should be designed with native plants where possible. Native plants generally have a broader tolerance for nutrient content, and can be longer lived in leaner/lower nutrient soils. An additional benefit of lower nutrient levels is that native plants will generally have less competition from weeds.

- d. Nutrients are better retained in soils with higher cation exchange capacity (CEC). CEC can be increased through selection of organic material with naturally high CEC, such as peat, and/or selection of inorganic material with high CEC such as some sands or engineered minerals (e.g., low P-index sands, zeolites, rhyolites, etc). Including higher CEC materials would tend to reduce the net leaching of nutrients.
- e. Soil structure can be more important than nutrient content in plant survival and biologic health of the system. If a good soil structure can be created with very low amounts of compost, plants survivability should still be provided. Soil structure is loosely defined as the ability of the soil to conduct and store water and nutrients as well as the degree of aeration of the soil. While soil structure generally develops with time, planting/storage media can be designed to promote earlier development of soil structure. Soil structure is enhanced by the use of amendments with high hummus content (as found in well-aged organic material). In addition, soil structure can be enhanced through the use of compost/organic material with a distribution of particle sizes (i.e., a more heterogeneous mix). Finally, inorganic amendments such as polymer beads may be useful for promoting aeration and moisture retention associated with a good soil structure. An example of engineered soil to promote soil structure can be found here:

<http://www.hort.cornell.edu/uhi/outreach/pdfs/custructuralsoilwebpdf.pdf>
- f. Younger plants are generally more tolerant of lower nutrient levels and tend to help develop soil structure as they grow. Starting plants from smaller transplants can help reduce the need for organic amendments and improve soil structure. The project should be able to accept a plant mortality rate that is somewhat higher than starting from larger plants and providing high organic content.
- g. With these considerations, it is anticipated that less than 10 percent compost amendment could be used, while still balancing plant survivability and water retention.

Plants

- 1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.
- 2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- 3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioinfiltration areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioinfiltration maintenance requirements are typical landscape care procedures and include:

- 1) **Watering:** Plants should be drought-tolerant. Watering may be required during prolonged dry periods after plants are established.
- 2) **Erosion control:** Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioinfiltration inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems, except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioinfiltration area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- 3) **Plant material:** Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.
- 4) **Nutrients and pesticides:** The soil mix and plants should be selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioinfiltration area, as well as contribute pollutant loads to receiving waters. By design, bioinfiltration facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.
- 5) **Mulch:** Replace mulch annually in bioinfiltration facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.
- 6) **Soil:** Soil mixes for bioinfiltration facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental

concern for at least 20 years in bioinfiltration systems. Replacing mulch in bioinfiltration facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

RWH-1: Rainwater Harvesting

Rainwater harvesting BMPs capture and store stormwater runoff for later use. These BMPs are engineered to store a specified volume of water with no surface discharge until this volume is exceeded. Storage facilities that can be used to harvest rainwater include cisterns (above ground tanks), open storage reservoirs (e.g., ponds and lakes), and underground storage devices (tanks, vaults, pipes, arch spans, and proprietary storage systems). Uses of captured water may potentially include irrigation demand, indoor non-potable demand, industrial process water demand, or other demands. Rainwater harvesting systems typically include several components: (1) methods to divert runoff to the storage device, (2) an overflow for when the storage device is full, and (3) a distribution system to get the water to where it is intended to be used. Harvesting systems typically include pretreatment to remove large sediment and vegetative debris. Systems used for internal uses may require an additional level of treatment prior to use.



Cistern

Photo Credit: MetaEfficient

Application

- Any type of land use, provided adequate water demand

Preventative Maintenance

- Debris and sediment removal
- After-rain inspections

Limitations

Rainwater harvesting may be used to meet all of the 5% EIA requirement if reliable demand is available. Rainwater harvesting is not required to be used if the available demands do not meet the volume required for 80% capture using a 72 hour drawdown time.

Design Criteria

Specific considerations for cistern rainwater harvesting systems include:

- Cisterns should include screens on gutters and downspouts to remove vegetative debris and sediment from the runoff prior to entering the cistern.
- Above-ground cisterns should be secured in place.
- Above-ground cisterns should not be located on uneven or sloped surfaces; if installed on a sloped surface, the base where the cistern will be installed should be leveled and designed for the weight of the filled cistern prior to installation.
- Child-resistant covers and mosquito screens should be placed on all water entry holes.
- A first flush diverter may be installed so that initial runoff bypasses the cistern. Where a first flush diverter is used, the diverted flows must be directed to a pervious area so that no runoff is produced or another form of treatment must be provided for this flow.
- Above-ground cisterns should be installed in a location with easy access for maintenance or replacement.

Specific considerations for underground detention include:

- Access entry covers (36" diameter minimum) should be locking and within 50 feet of all areas of the detention tank.
- In cases where the detention facility provides sediment containment, the facility should be laid flat and there should be at least 1/2 foot of dead storage within the tank or vault.
- Outlet structures should be designed using the 100-year storm as overflow and should be easily accessible for maintenance activities.
- For detention facilities beneath roads and parking areas, structural requirements should meet H₂O load requirements.
- In cases where groundwater may cause flotation, these forces should be counteracted with backfill, anchors, or other measures.

- Underground detention facilities should be installed on consolidated and stable native soil; if the facility is constructed in fill slopes, a geotechnical analysis should be performed to ensure stability.

General considerations include:

- In cases where there is non-potable indoor demand, proper pretreatment measures should be installed such as pre-filtration, cartridge filtration, and/or disinfection (which can also be provided between the cistern and point of use).
- Plumbing systems should be installed in accordance with the current California Building and Plumbing Codes (CBC – part of California Code of Regulations, Title 24).
- Underground detention facilities can be incorporated into a treatment train to provide initial or supplemental storage to other detention storage facilities and/or infiltration BMPs.
- Treatment of the captured rainwater (i.e. disinfection) may be required depending on the end use of the water.

Rainwater harvesting uses include:

- Harvested rainwater can be used for irrigation and other non-potable uses (if local, State, and Federal ordinances allow). The use of captured stormwater allows a reduced demand on the potable water supply. Cross-contamination should be prevented when make-up water is required for rainwater use demand by providing a backflow prevention system on the potable water supply line and/or an air gap.
- Irrigation Use
 - Subsurface (or drip) irrigation should not require disinfection pretreatment prior to use; other irrigation types, such as spray irrigation, may require additional pre-treatment prior to use
 - Selecting native and/or drought tolerant plants for landscaped area will reduce irrigation demand; however, they are still recommended for use.
- Domestic Use
 - Domestic uses may include toilet flushing and clothes washing (if local, State, and Federal ordinances allow).
 - Pretreatment requirements per local, State, or Federal codes and ordinances may apply.
- Other Non-Potable Uses

- Other potential non-potable uses may include vehicle/equipment washing, evaporative cooling, industrial processes, and dilution water for recycled water systems.

Sizing Criteria

The effectiveness of rainwater harvesting (RWH) systems is a function of tributary area, storage volume, demand patterns and magnitudes, and operational regime. If either of the latter two factors are too complex, simple design criteria metrics are not possible. The rainwater harvesting design criteria provided in this Fact Sheet are intended for the evaluation of systems that have relatively simple demand regimes and passive operation. If the answer to any of the following complexity screening questions is yes, a site-specific evaluation of rainwater harvesting effectiveness should be completed using a continuous simulation model with a long-term precipitation record.

Complexity Screening Questions:

- Does the proposed system have seasonally-varying demand other than irrigation?
- Will the system be operated by advanced control systems or otherwise actively controlled?
- Does the operational regime call for the system be shut down at any time during the rainy season?

Effectiveness of a harvesting system for retaining the SQDV depends on the cistern's effective storage capacity (i.e., the volume available for storage at the beginning of each event). Therefore, the required storage volume varies based on precipitation and demand. Using the following sizing charts, cisterns should be sized to achieve 80 percent capture efficiency. These nomographs are based on continuous simulation performed in EPA SWMM using precipitation and ET records representative of lowland regions (Oxnard Airport Precipitation Gauge, El Rio Spreading Grounds ET station) and mountainous regions (Ojai-Stewart Canyon Precipitation Gauge, Matilja ET Station) of the County.

Instructions for determining required cistern volume and demand are provided below:

Step 1: Determine Required Rainwater Harvesting Design Volume (RWHDV)

Note that a rainwater harvesting system sized for 80% capture runoff (as determined by continuous modeling), which can draw down in 72 hours is required to meet the 5% EIA standard. If the demand required to draw a tank sized for these parameters is not available, rainwater harvesting is not mandated for use. Partial capture of runoff is allowable if rainwater harvesting is desired for use. Sizing instructions for partial capture are included in [Step 3](#).

- 1) Determine the design storm required for 80% capture with a 72 hour drawdown time by selecting the project region (lowland or mountainous), then determining where the 72 hour drawdown curve intersects the 80% capture line. Pivot down from this intersection to the x axis to read the design storm, d_{design} .
- 2) Determine the required rainwater harvesting system volume using the following equation:

$$\text{RWHDV} = C * (d_{\text{design}}/12) * A_{\text{retain}} \quad (\text{Equation 6-19})$$

Where:

- RWHDV = rainwater harvesting design volume (acre-ft)
- C = runoff coefficient, calculated using Appendix E and the site imperviousness
- d_{design} = design storm required for 80% capture with a 72 hour drawdown time, estimated as described in 1) (inches)
- A_{retain} = the drainage area from which runoff must be retained (acres)

Step 2: Determine the Required Daily Demand to Achieve 80% Capture

- 1) The required daily demand to achieve 80% capture of runoff can be calculated as follows:

$$\text{Demand} = [\text{RWHDV}/(72/24)] * (325,851) \quad (\text{Equation 6-20})$$

Where:

- Demand = required project daily demand to draw down rainwater harvesting system sized for 80% capture in 72 hours (gallons)
- RWHDV = rainwater harvesting design volume (acre-ft), from Step 1 above

If the project daily demand is less than the Demand calculated, the project is not required to utilize rainwater harvesting. If rainwater harvesting is desired for use for partial retention, if a longer drawdown time is desired, or if a predetermined daily demand is to be used, refer to Steps 3 and 4 below.

Step 3: Determine RWHDV for Partial Retention or a Longer Drawdown Time

- 1) Calculate RWHDV for selected combination of % capture and drawdown time using nomographs and the following equation:

$$RWHDV = C * (d_{\text{design}}/12) * A_{\text{retain}} \quad (\text{Equation 6-21})$$

Where:

- RWHDV = rainwater harvesting design volume (acre-ft)
- C = runoff coefficient, calculated using Appendix E and the site imperviousness
- d_{design} = design storm required for selected % capture and drawdown time (inches)
- A_{retain} = the drainage area from which runoff must be retained (acres)

- 2) Determine the required daily demand for the selected capture efficiency and/or drawdown time:

$$Demand = [RWHDV / (t_{\text{drawdown}}/24)] * (325,851) \quad (\text{Equation 6-22})$$

Where:

- Demand = required project daily demand to draw down rainwater harvesting system sized for 80% capture in 72 hours (gallons)
- RWHDV = rainwater harvesting design volume (acre-ft), from 1) above
- t_{drawdown} = selected drawdown time (hours)

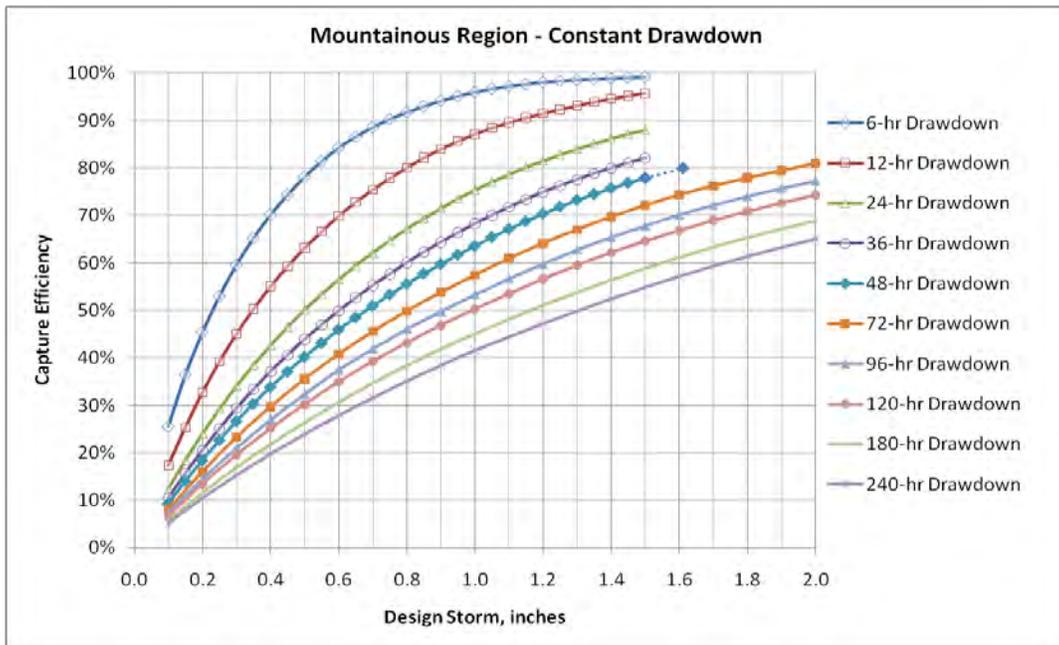
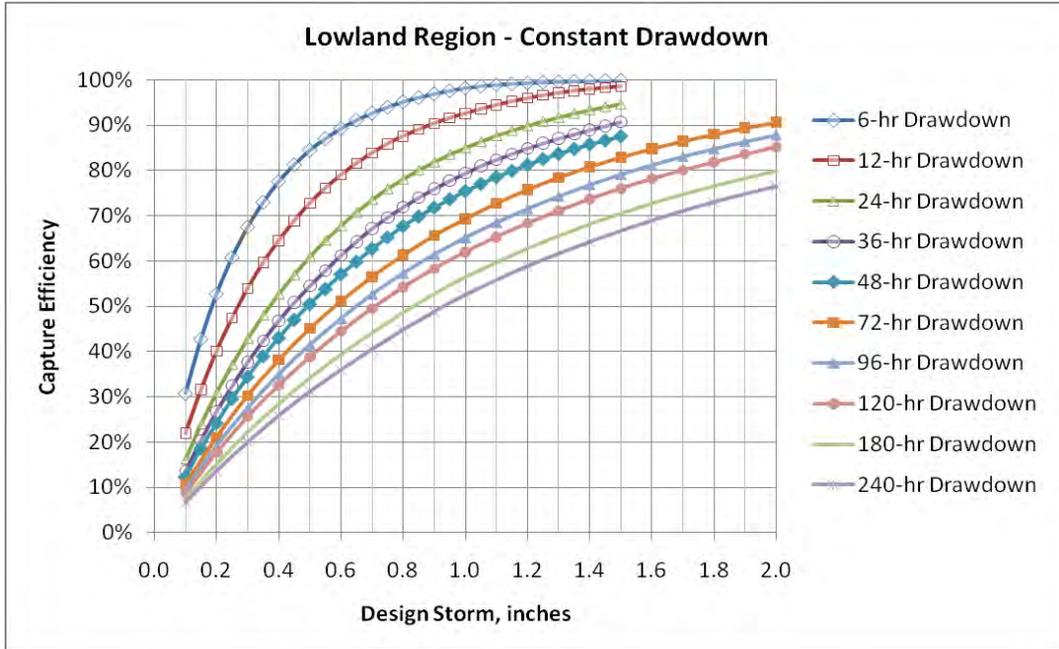
Step 4: Determine RWHDV for a Predetermined Daily Demand

- 1) Determine the daily demand requirement in acre-feet (1 acre-foot = 325,851 gallons).
- 2) Calculate the required RWHDV for the desired drawdown time using the following equation:

$$RWHDV = Demand * (t_{\text{drawdown}}/24) \quad (\text{Equation 6-23})$$

Where:

- Demand = required project daily demand (acre-feet)
- RWHDV = rainwater harvesting design volume (acre-ft)
- t_{drawdown} = selected drawdown time (hours)



Operations and Maintenance

- 1) Inspect storage facilities, associated pipes, and valve connections for leaks.
- 2) Clean gutters and filters of debris that has accumulated and is obstructing flow into the storage facility.
- 3) Clean and remove accumulated sediment annually.
- 4) Check cisterns for stability and anchor if necessary.
- 5) If the storage device is underground, ensure that a manhole is accessible, operational, and secure.

ET-1: Green Roof

Green roofs (also known as eco-roofs and vegetated roof covers) are roofing systems that layer a soil/vegetative cover over a waterproofing membrane. Green roofs rely on highly porous media and moisture retention layers to store intercepted precipitation and to support vegetation that can reduce the volume of stormwater runoff via evapotranspiration. There are two types of green roofing systems: extensive, which is a light-weight system; and intensive, which is a heavier system that allows for larger plants but requires additional structural support.



Green Roof Examples

Photo Credits:

1. Milwaukee Department of Environmental Sustainability;
2. Geosyntec Consultants

Application

- Building roofs
- Outdoor eating area roofs
- Parking structure or turnaround roofs

Preventative Maintenance

- Weeding and pruning
- Leaf and debris removal
- Regular membrane inspection
- Drain cleanout

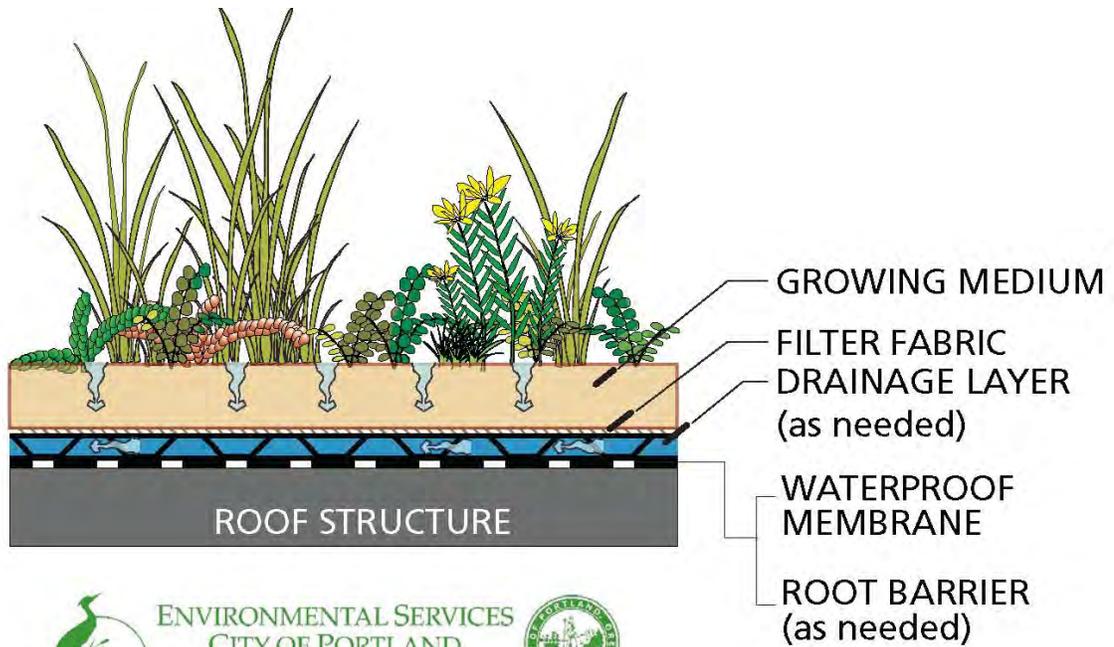


Exhibit A: Green Roof Schematic Courtesy of Portland, OR Environmental Services Department



Exhibit B: Green Roof Schematic Courtesy of American Wick



Figure 6-9: Green Roofs

Limitations

The following describes additional site suitability recommendations and limitations for green roofs.

- Typically not used for steep roofs (>25%); and
- Structural roof support must be sufficient to support additional roof weight.

Design Criteria

Green roofs should be designed according to the requirements listed in Table 6-17 and outlined in the section below.

Table 6-17: Green Roof Design Criteria

Design Parameter	Unit	Design Criteria
Soil depth range	inch	2 – 6
Saturated soil weight	lbs. / sq. ft.	10 – 25
Maximum roof slope	%	25
Minimum roof slope	--	Flat
Vegetation type	--	Varies (see vegetation section below)
Vegetation height	--	Varies (see vegetation section below)

Sizing

Green roofs may provide quantifiable reduction in volume. However, they are not explicitly sized to meet the water quality treatment requirements. Rather, the volume reduction is accounted for implicitly in sizing calculations for the treatment BMPs for the remainder of the site by assuming that the roof area is pervious rather than impervious when calculating a runoff coefficient for the site.

Green Roof Components***Structural Support***

The first requirement that must be met before installing a green roof is the structural support of the roof. The roof must be able to support the additional weight of the soil, water, and vegetation. A licensed structural engineer should be consulted to determine the proposed structural support during the design phase.

Waterproof Roofing Membrane

Waterproof roofing membrane is an integral part of a green roofing system. The waterproof membrane prevents the roof runoff from penetrating and damaging the roofing material. There are many materials available for this purpose and come in various forms (i.e., rolls, sheets, liquid) and exhibit different characteristics (e.g., flexibility, strength, etc.). Depending on the type of membrane chosen a root barrier may be required to prevent roots from compromising the integrity of the membrane.

Drainage Layer

Depending on the design of the roof, a drainage layer may be required to convey the excess runoff from of the roof. If a drainage layer is needed, there are numerous options including a gravel layer (which may require additional structural support), and many styles and types of plastic drainage layers.

Soil Considerations

The soil layer is an important factor in the construction and operation of green roofs. The soil layer must have excellent drainage, not be too heavy when saturated, and be adequately fertile as a growing medium for plants. Many companies sell their own proprietary soil mixes. However, a simple mix of 1/4 topsoil, 1/4 compost, and the remainder pumice perlite may be used for many applications. Other soil amendments may be substituted for the compost and the pumice perlite. The soil mix used should not contain any clay.

Vegetation

Green roofs must be vegetated in order to provide adequate treatment of runoff via filtration and evapotranspiration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. Green roofs should be vegetated with a mix of erosion-resistant plant species that effectively bind the soil and can withstand the extreme environment of rooftops. A diverse selection of low growing plants that thrive under the specific site, climatic, and watering conditions should be identified. A mixture of drought-tolerant, self-sustaining (perennial or self-sowing without need for fertilizers, herbicides, and or pesticides) is most effective in the Ventura County region. Plants selected should also be low maintenance and able to withstand heat, cold, and high winds. Native or adapted sedum/succulent plants are preferred because they generally require less fertilizer, limited maintenance, and are more drought resistant than exotic plants. When appropriate, green roofs may be planted with larger plants. However, this depends on structural support and soil depth.

The following provides additional vegetation guidance for green roofs.

- 1) For extensive roofs, trees or shrubs may be used as long as the increased soil depth required may be supported.

- 2) Irrigation is required if the seed is planted in spring or summer. The use of a permanent smart (self-regulating) irrigation system or other watering system, may help provide maximal water quality performance. Drought-tolerant plants should be specified to minimize irrigation requirements. For projects seeking “High Performance Building” recognition, ASHRAE Standard 189.1 states that potable water cannot be used for irrigating green roofs after they are established.
- 3) Locate the green roof vegetation in an area without excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.
- 4) A relevant plant list should be provided by a landscape professional and used as a guide to support project-specific planting recommendations, including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Drain

- 1) There must be a drain pipe (gutter) to convey runoff (both overflow and underdrain flow, if appropriate) safely from the roof to another basic or stormwater runoff BMP, a pervious area, or the stormwater conveyance system.

Construction Considerations

- 1) Building structure must be adequate to hold the additional weight of the soil, retained water, and plants.
- 2) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

- 1) During the establishment period, green roofs may need irrigation and occasional light fertilization until the plants have fully established themselves. Once healthy and fully established, properly selected climate-appropriate plants will no longer need irrigation except during extreme drought.
- 2) Weeding during the establishment period may be required to ensure proper establishment of the desired vegetation. Once established and assuming proper selection of vegetation, the vegetation should not require any preventative maintenance.
- 3) The roofing membrane should be inspected routinely, as it is a crucial element of the green roof. In addition, preventative inspection of the drainage paths is required to ensure that there are no clogs in the system. If a green roof is not properly draining, the moisture in the system may cause the roof to leak and/or the plants to drown or rot. Leaks in the roof may occur not only due to improper drainage, but also if the incorrect combination of waterproofing barrier, root barrier, and drainage systems

- are selected. Leak inspections in the roofing system are advised, especially in locations prone to leaks, such as at all joints.
- 4) Inspect green roofs for erosion or damage to vegetation after every storm greater than 0.75 inches and at the end of the wet season to schedule summer maintenance and in the fall to ensure readiness for winter. Additional inspection after periods of heavy runoff is recommended. Green roofs should be checked for debris, litter, and signs of clogging.
 - 5) Replanting and/or reseeding of vegetation may be required for reestablishment.
 - 6) Vegetation should be healthy and dense enough to provide filtering while protecting underlying soils from erosion.
 - 7) Fallen leaves and debris from deciduous plant foliage should be removed.
 - 8) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
 - 9) Dead vegetation should be removed if greater than 10% of the area coverage. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

ET-2: Hydrologic Source Control BMPs

Hydrologic source control (HSC) BMPs are simple BMPs that are highly integrated with the site design to reduce runoff volume. The practices described in this fact sheet include impervious area dispersion, street trees, and rain barrels.



Application

- Building roofs
- Sidewalks and patios
- Landscaping hardscapes

Preventative Maintenance

- Weeding and pruning
- Leaf and debris removal



Hydrologic Source Control Examples

Photo Credits:

1.

<http://www.auburn.edu/projects/sustainability/website/newsletter/0910.php>;

2. Geosyntec Consultants;

3. toronto.ca/environment/water.htm

Accounting for Hydrologic Source Controls in Hydrologic Calculations

The effects of HSC BMPs are accounted for in hydrologic calculations as an adjustment to the storm depth used in the SQDV calculations described in [Section 2](#). Runoff volume calculations are performed exactly as described in Section 2, with the exception that the storm depth used in the calculation is adjusted prior to the calculation. Adjustments are based on the type and magnitude of HSC BMPs employed for the drainage area per guidance outlined in this Fact Sheet.

EXAMPLE 6.1: ACCOUNTING FOR HSCS IN HYDROLOGIC CALCULATIONS

Given:

- A drainage area consists of a 1 acre building roof surrounded by 0.25 acres of landscaping (80 percent composite imperviousness);
- The drainage from the roof is spread uniformly over the entire pervious area via splash pads and level spreaders;
- Soils are moderately well drained and have a shallow slope;
- For the purpose of this example, assume the hydrologic source control adjustment for this configuration of disconnected downspouts is 0.3 inches. For an actual project, hydrologic source control adjustment would be calculated based on instructions in this section; and
- The unadjusted design storm depth at the project site is 0.75 inches.

Result:

- 1) The designer uses 0.75 inches – 0.3 inches = 0.45 inches in the calculation of SQDV.

Impervious Area Dispersion

Impervious area dispersion refers to the practice of routing runoff from impervious areas, such as rooftops, walkways, and patios, onto the surface of adjacent pervious areas. Runoff is dispersed uniformly via splash block or dispersion trench and soaks into the ground as it moves slowly across the surface of the pervious area. Minor ponding may occur, but it is not the intent of this practice to actively promote localized on-lot infiltration, which should be designed as an infiltration BMP (see INF-1 through INF-6 above).

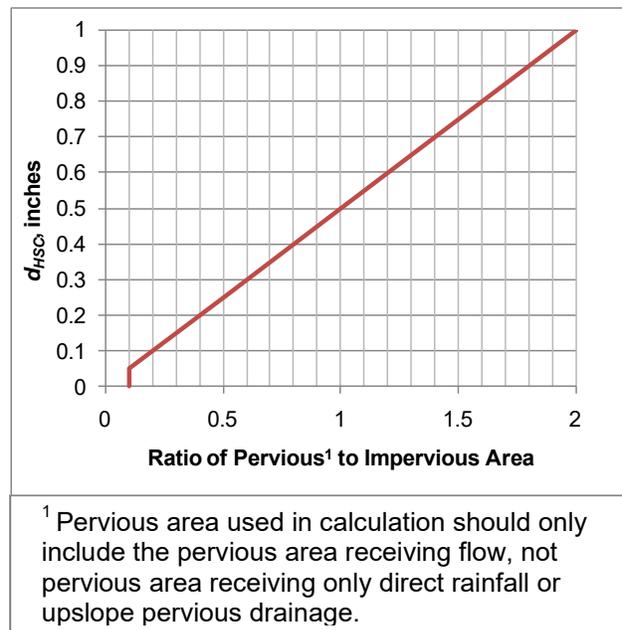
Design Considerations

- 1) Not likely to result in net increased infiltration over existing condition for previously pervious sites, but has potential to result in some geotechnical hazards associated with infiltration.
- 2) Significant pervious area should be available, at a ratio of at least 1 part pervious area capable of receiving flow to 5 parts impervious.

- 3) Pervious area receiving flow should have a slope ≤ 2 percent and path lengths of ≥ 10 feet per 1000 sf of impervious area.
- 4) Overflow from the pervious area up to the SQDV should be directed to a Retention BMP, Biofiltration BMP, or Treatment Control Measure. Larger flows should be directed to the storm drain system.
- 5) Soils in the pervious area should be preserved in their natural condition or improved with soil amendments (see Soil Amendments below).
- 6) Impervious area disconnection is an HSC that may be used as the first element in any treatment train.
- 7) The use of impervious area disconnection reduces the sizing requirement for downstream Retention BMPs, Biofiltration BMPs, and/or Treatment Control Measures.

Calculating HSC Retention Volume

- 1) The retention volume provided by downspout dispersion is a function of the ratio of impervious to pervious area.
- 2) Determine flow patterns in pervious area and estimate footprint of pervious area receiving dispersed flow. Calculate the ratio of pervious to impervious area.
- 3) Check soil conditions using the checklist below; amend if necessary.
- 4) Look up the storm retention depth (d_{HSC}), from the chart to the right.



- 5) The max d_{HSC} is equal to the design storm depth for the project site.

Soil Condition Checklist

- 1) Soil should have a maximum slope of 2 percent.
- 2) Landscaping should be well-established.
- 3) Amended soils should consist of: 60 to 70% sand, 15 to 25% compost, 10 to 20% clean topsoil. The organic content of the soil mixture should be 8 to 12%; the pH range should be 5.5 to 7.5.

Additional References

- SMC LID Manual (pp 131):
http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- City of Portland Bureau of Environmental Services. 2010. How to manage stormwater – Disconnect Downspouts:
<http://www.portlandonline.com/bes/index.cfm?c=43081&a=177702>
- Seattle Public Utility:
http://www.cityofseattle.org/util/stellent/groups/public/@spu/@usm/documents/webcontent/spu01_006395.pdf
- Thurston County, Washington State (pp 10):
http://www.co.thurston.wa.us/wwm/Engineering_Standards/Drainage_Manual/PDFs/DG-5%20Roof%20Runoff%20Control.pdf

Amended Soils

A soil amendment is any material added to the upper layer of soil especially in the vicinity of the root zone soil to improve its physical properties, such as the water retention, permeability, water infiltration, drainage, aeration and structure. The goal is to provide a better environment for roots. To do its work, an amendment should be thoroughly mixed into the soil. If it is merely buried, its effectiveness is reduced and it will interfere with water and air movement and root growth.

Amending a soil is different from mulching, although many mulches also are used as amendments. A mulch is left on the soil surface. Its purpose is to reduce evaporation and runoff, inhibit weed growth, and create an attractive appearance. Mulches also moderate soil temperature, helping to warm soils in the spring and cool them in the summer. Mulches may be incorporated into the soil as amendments after they have decomposed to the point that they no longer serve their purpose.

Organic amendments, such as compost, increase soil organic matter content and offer many benefits. Organic matter improves soil aeration, water infiltration, and both water- and nutrient-holding capacity. Many organic amendments contain plant nutrients and act as organic fertilizers. Organic matter also is an important energy source for bacteria, fungi and earthworms that live in the soil.

Design Considerations

- 1) Landscaped and other developed pervious areas can be amended to improve evapotranspiration and soil moisture storage capacity.
- 2) Landscape and other developed pervious areas can be amended to increase infiltration rates in cases where the limiting infiltration horizon exists near the surface of the soil column.

- 3) Soil amendments are common components of several Retention BMPs, Biofiltration BMPs, and Treatment Control Measures, including infiltration basins, bioretention, vegetated swales, filter strips, planter boxes, green roofs, dry extended detention basins, wet retention basins, and constructed treatment wetlands.
- 4) Compost, soil conditioners, and fertilizers should be rototilled into the native soil to a minimum depth of 6 inches; 12 inches preferred.
- 5) All soil amendments shall be free of sticks, glass, plastic, metal, debris larger than 1 inch, and other deleterious material.
- 6) Compost shall meet criteria listed in the guidelines for planting and storage media.

Calculating HSC Retention Volume

No retention credit is given for amended soils alone. Amended soils should be used to increase the retention volume of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures.

Additional References

- San Diego County LID Handbook Appendix 4 (Factsheet 30):
<http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf>
- Colorado State University Extension website:
<http://www.ext.colostate.edu/pubs/garden/07235.html>

Street Trees

By intercepting rainfall, trees can provide several aesthetic and stormwater benefits including peak flow control, increased infiltration and evapotranspiration, and runoff temperature reduction. The volume of precipitation intercepted by the canopy reduces the treatment volume required for downstream treatment BMPs. Shading reduces the heat island effect as well as the temperature of adjacent impervious surfaces over which stormwater flows, and thus reduces the heat transferred to the downstream waterbody. Tree roots also strengthen the soil structure and provide infiltrative pathways, simultaneously reducing erosion potential and enhancing infiltration.

Design Considerations

- 1) Street trees can be incorporated along sidewalks, streets, parking lots, or driveways.
- 2) Street trees can be used in combination with bioretention systems along medians or in traffic calming bays.
- 3) There should be sufficient space available to accommodate both the tree canopy and the root system.

- 4) The mature tree canopy, height, and root system should not interfere with subsurface utilities, overhead powerlines, buildings and foundations, or other existing or planned structures.
- 5) Depending on space constraints, a 20 to 30 foot canopy (at maturity) is recommended for stormwater mitigation.
- 6) Native, drought-tolerant species should be selected in order to minimize irrigation requirements and improve the long-term viability of the tree.
- 7) Trees should not impede pedestrian or vehicle sight lines.
- 8) Planting locations should receive adequate sunlight and wind protection. Other environmental factors should be considered prior to planting.
- 9) Soils should be preserved in their natural condition (if appropriate for planting) or restored via soil amendments. If necessary, a landscape architect should be consulted.

Calculating HSC Retention Volume

- 1) The retention volume provided by streets trees via canopy interception is dependent on the tree species, time of the year, and maturity.
- 2) To compute the retention credit, the expected impervious area covered by the full tree canopy after 4 years of growth should be computed (IA_{HSC}). The maximum retention depth credit for canopy interception (d_{HSC}) is 0.05 inches.

Additional References

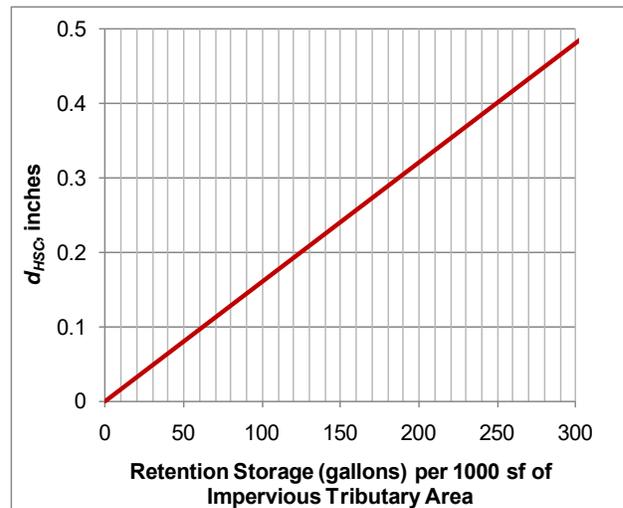
- California Stormwater BMP Handbook:
http://www.cabmphandbooks.com/Documents/Development/Section_3.pdf
- City of Los Angeles, Street Tree Division - Street Tree Selection Guide:
<http://bss.lacity.org/UrbanForestryDivision/StreetTreeSelectionGuide.htm>
- Portland Stormwater Management Manual:
<http://www.portlandonline.com/bes/index.cfm?c=35122&a=55791>
- San Diego County LID Handbook Fact Sheets:
<http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf>

Residential Rain Barrels

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later use for irrigating landscaped areas.

Design Considerations

- 1) If detained water will be used for irrigation, sufficient vegetated areas and other impervious surfaces should be present in the drainage area.
- 2) Storage capacity and sufficient area for overflow dispersion should be accounted for.
- 3) Screens on gutters and downspouts to remove sediment and particles as the water enters the barrel or cistern should be provided.
- 4) Removable child-resistant covers and mosquito screening should be provided to prevent unwanted access.
- 5) Above-ground barrels should be secured in place.
- 6) Above-ground barrels should not be located on uneven or sloped surfaces. If installed on a sloped surface, the base where the rain barrel will be installed should be leveled prior to installation.
- 7) Overflow dispersion should occur greater than 5 feet from building foundations.
- 8) Dispersion should not cause geotechnical hazards related to slope stability.
- 9) Effective energy dissipation and uniform flow spreading methods should be employed to prevent erosion and facilitate dispersion.
- 10) Placement should allow easy access for regular maintenance.

*Calculating HSC Retention Volume*

- 1) The retention volume provided by rain barrels that are not actively managed can be computed as 50% of the total storage volume (e.g., 22.5 gallons for each 55 gallon barrel).
- 2) If the rain barrel is actively managed, then it should be treated as a cistern (see RWH-1).
- 3) Estimate the average retention volume per 1000 square feet impervious tributary area provided by rain barrels.
- 4) Look up the storm retention depth (d_{HSC}), from the chart to the right.
- 5) The max d_{HSC} is equal to the design storm depth for the project site.

Additional References

- Santa Barbara BMP Guidance Manual, Chapter 6:
http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/o/Manual_071008_Final.pdf
- County of Los Angeles LID Standards Manual:
http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf
- SMC LID Manual (pp 114):
http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- San Diego County LID Handbook Appendix 4 (Factsheet 26):
<http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf>

BIO-1: Bioretention with Underdrain

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Bioretention with an underdrain is a treatment control measures that can be used for areas with low permeability native soils or steep slopes. Bioretention may be designed without an underdrain to serve as a retention BMP in areas of high soil permeability (see [INF-3 Bioretention](#)) or partial retention/ partial biofiltration BMP (see [INF-7: Bioinfiltration](#)).



Bioretention in Parking Lots

Photo Credits: Geosyntec Consultants

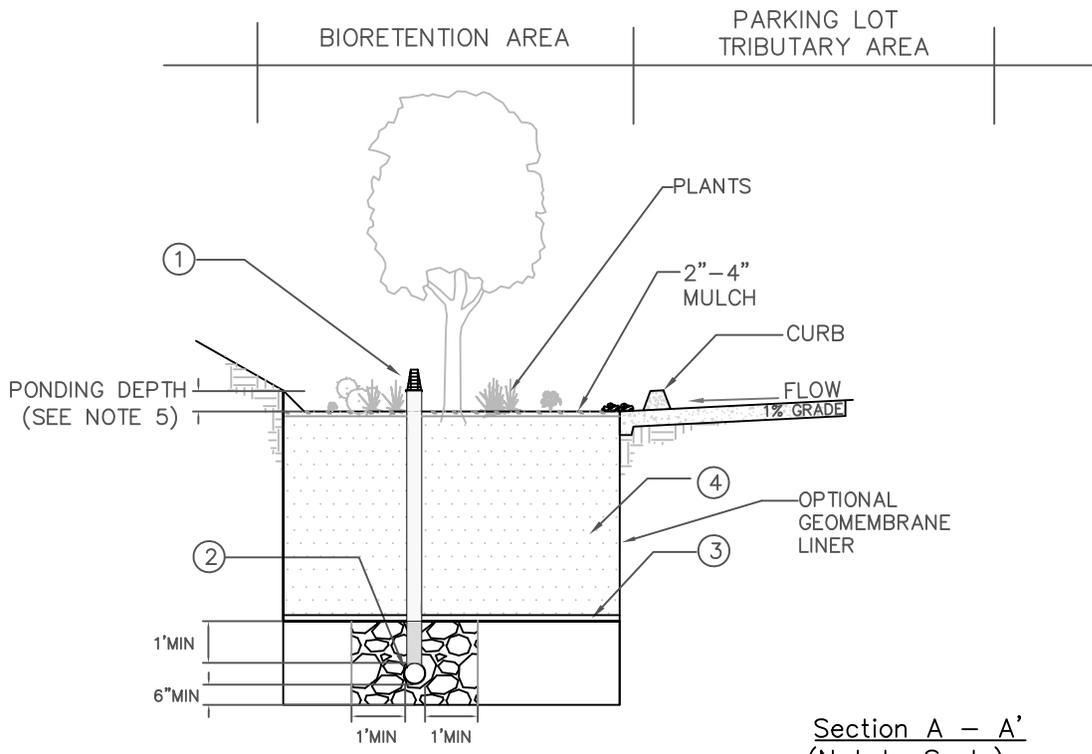
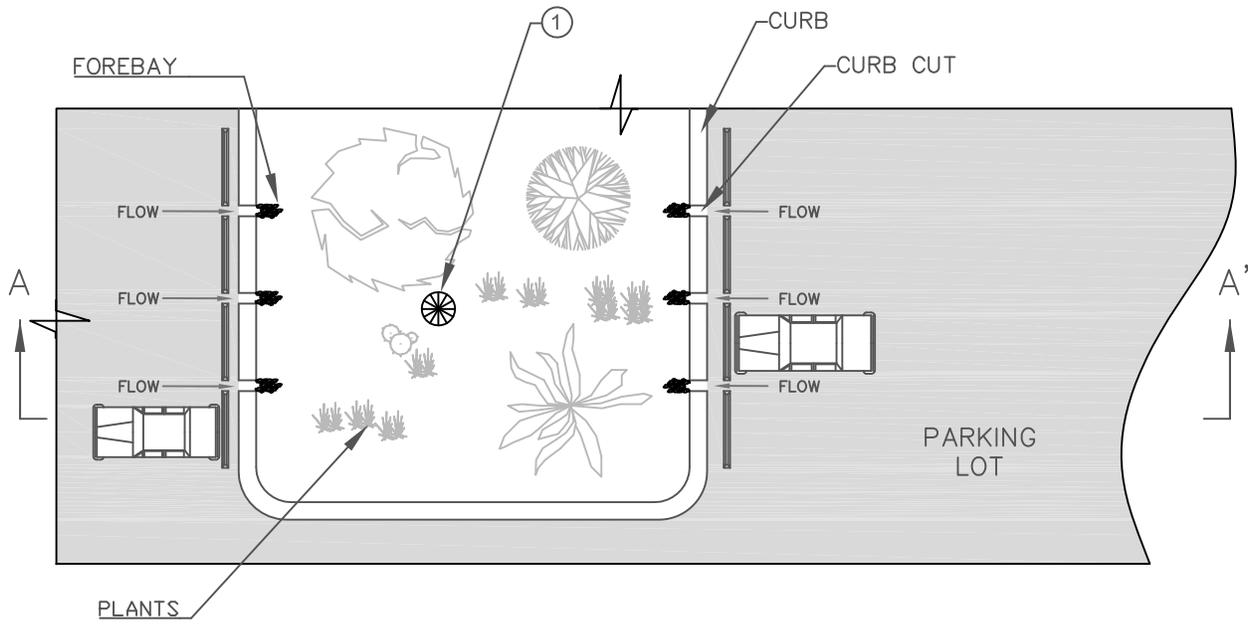
Application

- Parking lots
- Roadway parkways and medians
- School entrances, courtyards, and walkways
- Playgrounds and sports fields

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

Plan View
(Not to Scale)



NOTES:

- ① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
- ② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
- ③ OPTIONAL CHOKING GRAVEL LAYER.
- ④ 2' MIN PLANTING MIX; 3' PREFERRED.
- ⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.

Section A - A'
(Not to Scale)

<p>Figure 6-10: Bioretention with Underdrain</p>

Limitations

- 1) Vertical relief and proximity to storm drain - site must have adequate relief between land surface and storm drain to permit vertical percolation through the soil media and collection and conveyance in underdrain to storm drain system.
- 2) Depth to groundwater - shallow groundwater table may not permit complete drawdown between storms.

Design Criteria

Bioretention with an underdrain should be designed according to the requirements listed in Table 6-18 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-18: Bioretention with an Underdrain Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	72
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18 inches
Minimum thickness of amended soils layer	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide

Design Parameter	Unit	Design Criteria
		capacity for maximum rate filtered through amended media
Gravel layer	-	A gravel bed should be provided around underdrain. Underdrain should have at least 1 foot of gravel installed to the sides and on top of the underdrain, and at least 0.5 feet of gravel installed below underdrain.
Overflow device	-	Required

Sizing Criteria

Bioretention facilities with underdrains shall be designed to capture and treat the SQDV. However because these systems commonly have a relatively high amended soil infiltration rate and shallow depth, these systems are typically capable of filtering a significant portion of the SQDV during a storm event. Therefore, a simplified routing approach is described in the following steps that accounts for the portion of the SQDV that is filtered during the storm event.

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and biofilter the SQDV (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design K_{sat} is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design K_{sat} .

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and aggregate layer.

- 1) Select a surface ponding depth (d_p) that satisfies geometric criteria and is congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however, it requires greater consideration for public safety, energy dissipation, and plant selection.
- 2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft} \quad (\text{Equation 6-24})$$

Where:

- $t_{ponding}$ = required drain time of surface ponding (≤ 72 hrs)
- d_p = selected surface ponding water depth (ft)
- K_{design} = media design saturated hydraulic conductivity (in/hr)
(see Step 2, above)

If $t_{ponding}$ exceeds 72 hours, return to (1) and reduce surface ponding or increase media K_{design} . Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 72 hours unless a low K_{design} is specified.

- 3) Compute depth of water that may be filtered during the design storm event as follows:

$$d_{filtered} = \text{Minimum} \left[\frac{K_{design} \times T_{routing}}{12 \frac{in}{ft}}, d_p \right] \quad (\text{Equation 6-25})$$

Where:

- $d_{filtered}$ = depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed the surface ponding depth (d_p)
- K_{design} = design saturated hydraulic conductivity (in/hr) (see Step 2, above)
- $T_{routing}$ = storm duration that may be assumed for routing calculations; this should be assumed to be 3 hours unless rationale for an alternative assumption is provided
- d_p = selected surface ponding water depth (ft)

The intention is that routing is important in the appropriate sizing of bioretention with underdrains. However, the depth of water considered to be filtered during the storm should be limited to the maximum ponding depth. This

results in designs that are robust to account for a variety of storm depths and durations. This limitation is for sizing calculations only. In reality, the depth that is filtered during a storm will vary based on storm depth, duration, and intensity. This TGM does not intend to limit the amount that may actually be filtered.

- 4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \quad \text{(Equation 6-26)}$$

Where:

- A_{req} = required infiltrating area (ft²). Should be calculated at the contour corresponding to the mid ponding depth (i.e., 0.5× d_p from the bottom of the facility)
- $SQDV$ = stormwater quality design volume (ft³)
- d_p = selected surface ponding water depth (ft)
- $d_{filtered}$ = depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See Equation 6-15)

- 5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., 0.5× d_p from the bottom of the facility).

Geometry

- 1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

- 2) Bioretention should be designed to drain below the planting soil in less than 72 hours and completely drain from the underdrain in 96 hours (both starting from the end of inflow).

The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

- 1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.
- 2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.
- 3) Curb cuts for roadside or parking lot areas: Curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and provide an area for settling and periodic removal of sediment and coarse material before flow dissipates to the remainder of the cell.
- 4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.
- 5) Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

- 1) 6-inch minimum diameter.
- 2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*
- 3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.
- 4) Underdrains should be sloped at a minimum of 0.5%.
- 5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top

elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

- 6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

- 7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft², should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

- 8) For bioretention facilities enhanced to remove address nitrogen as the primary pollutant class, the underdrain should be elevated from the bottom of the bioretention facility by at least 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO₂ and NO₃) instead of oxygen for respiration.*

An alternative enhanced nitrogen removal design is to include an internal water storage layer by adding a 90-degree elbow to the underdrain to raise the outlet. This design feature provides additional storage in the media. The bioretention facility must have at least 30 inches of planting media. The top of the elbow should be at

least 12 inches below the top of the planting media, and in poorly draining soils, should preferably be 18 to 24 inches below the top of the planting media. The top of the water storage layer should not be less than 12 inches from the bottom of the planting media layer. (For more information, see [Urban Waterways](#) publication).

- 9) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required at the maximum ponding depth. The following, or equivalent, should be provided:

- 1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.
- 2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.
- 3) The inlet to the riser should be at the ponding depth (maximum 18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

- 1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.
- 2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.
- 3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using

#200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

- 4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:
 - Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
 - Organic matter: 35-75% dry weight basis.
 - Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
 - Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
 - Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - $NH_4:NH_3 < 3$
 - Ammonium < 500 ppm, dry weight basis

- Seed Germination > 80% of control
- Plant trials > 80% of control
- Solvita® > 5 index value
- Nutrient content:
 - Total Nitrogen content 0.9% or above preferred
 - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, 1/4 inch, 1/2 inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
1/2 inch	90	100
1/4 inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range (“minimum” column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

- 5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity.*

Plants

Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

- 1) **Watering:** Plants should be selected to be drought-tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.
- 2) **Erosion control:** Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- 3) **Plant material:** Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.
- 4) **Nutrient and pesticides:** The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often

- elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.
- 5) **Mulch:** Replace mulch annually in bioretention facilities where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.
 - 6) **Soil:** Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in bioretention facilities where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-2: Planter Box

Planter boxes are bioretention treatment control measures that are completely contained within an impermeable structure with an underdrain (they do not infiltrate). These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and an underdrain within the planter box. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Planter boxes are comprised of a variety of materials, usually chosen to be the same material as the adjacent building or sidewalk.

Planter boxes may be placed adjacent to or near buildings, other structures, or sidewalks. Planter boxes can be used directly adjacent to buildings beneath downspouts as long as the boxes are properly lined on the building side and the overflow outlet discharges away from the building to ensure water does not percolate into footings or foundations. They can also be placed further away from buildings by conveying roof runoff in shallow engineered open conveyances, shallow pipes, or other innovative drainage structures.



Planter boxes extending along a building wall

Photo Credit: Geosyntec Consultants

Application

- Areas adjacent to buildings and sidewalks
- Building entrances, courtyards, and walkways

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures

Periodically observe function under wet weather conditions

Limitations

The applicability of stormwater planter boxes is limited by the following site characteristics:

- 1) The tributary area (area draining to the planter box area) should be less than 15,000 ft².
- 2) Groundwater levels should be at least 2 ft lower than the bottom of the planter box.
- 3) Site must have adequate vertical relief between land surface and the stormwater conveyance system to permit connection of the underdrain to the stormwater conveyance system.
- 4) Planter boxes should not be located in areas with excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

Design Criteria

Planter boxes should be designed according to the requirements listed in Table 6-19 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-19: Planter Box Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Drawdown time of planting soil	hours	12
Maximum ponding depth	inches	12
Minimum soil depth	feet	2; 3 preferred
Stabilized mulch depth	inches	2 to 3
Planting soil composition	-	60 to 70% sand, 30 to 40% compost
Underdrain	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent)
Overflow device	-	Required

Sizing Criteria

See [Sizing Criteria](#) section in the BIO-1: Bioretention with underdrains fact sheet.

Geometry and Size

- 1) Planter boxes areas should be sized to capture and treat the SQDV with a 12 inch maximum ponding depth. The mulch layer should be included as part of the ponding depth.
- 2) Minimum soil depth should be 2 feet, although 3 feet is preferred. *The intention is that a minimum soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV. A deeper planting soil depth will provide a smaller surface area footprint.*
- 3) Planter boxes should be designed to drain to below the planting soil depth in less than 48 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, prevent long periods of saturation for plant health, maintain adequate soil oxygen levels for healthy soil biota and vegetation, reduce potential for vector breeding, and provide proper soil conditions for biodegradation and retention of pollutants.*
- 4) Any planter box shape configuration is possible as long as other design criteria are met.
- 5) The distance between the downspouts and the overflow outlet should be maximized. *The intention is to increase the opportunity for stormwater retention and filtration.*
- 6) Off-line configurations should be considered to minimize the possibility of scouring and resuspension of previously captured pollutants during large storms.

Structural Materials

- 1) Planter boxes should be constructed out of stone, concrete, brick, recycled plastic, or other permanent materials. Pressure-treated wood or other materials that may leach pollutants (e.g., arsenic, copper, zinc, etc.) should not be allowed.
- 2) The structure should be adequately sealed or a waterproof membrane installed to ensure water only exits the structure via the underdrain.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for planter boxes:

- 1) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

- 2) Woody plants (e.g., trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains are required and should meet the following criteria:

- 1) 6-inch minimum diameter.
- 2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*
- 3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch opening per lineal foot and should face down.
- 4) Underdrains should be sloped at a minimum of 0.5%.
- 5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of underdrain pipes not terminating in an observation well/cleanout should also be capped.
- 6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

- 7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should

meet a minimum permittivity rate of 75 gal/min/ft², should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

- 8) The underdrain should be elevated from the bottom of the bioretention facility by 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO₂ and NO₃) instead of oxygen for respiration.*
- 9) The underdrain must drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required to be set at 2 inches below the top of the planter and no more than 12 inches above the soil surface. The most common option is a vertical riser, described below.

Vertical riser

- 1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.
- 2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.
- 3) The inlet to the riser should be a maximum of 12 inches above the planting soil, and be capped with a spider cap. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

A waterproof barrier should be provided to restrict moisture away from foundations. Geomembrane liners should have a minimum thickness of 30 mils. Equivalent waterproofing measures may be used.

Planting/Storage Media

- 1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Planter box soil shall also support vigorous plant growth.
- 2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.
- 3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for the planter box should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

- 4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal

of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - $NH_4:NH_3 < 3$
 - Ammonium < 500 ppm, dry weight basis
 - Seed Germination > 80% of control
 - Plant trials > 80% of control
 - Solvita® > 5 index value
- Nutrient content:
 - Total Nitrogen content 0.9% or above preferred
 - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for planter box should be analyzed by an accredited lab using #200, 1/4 inch, 1/2 inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
1/2 inch	90	100
1/4 inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in planter box media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range (“minimum” column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the planter box media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

- 5) The planter box should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity.*

Plants

- 1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.
- 2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- 3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.
- 4) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

Planter boxes require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, planter box maintenance requirements are typical of landscape care procedures and include:

- 1) Watering: Plants should be selected to be drought-tolerant and do not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.
- 2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for an inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems

- except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the flow entrance. If sediment is deposited in the planter box, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- 3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.
 - 4) Nutrients and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the planter box area, as well as contribute pollutant loads to receiving waters. By design, planter boxes are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.
 - 5) Mulch: Replace mulch annually in planter boxes where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial, auto dealer/repair, parking lots, and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.
 - 6) Soil: Soil mixes for planter boxes are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in planter boxes where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in planter boxes. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-3: Vegetated Swale

Vegetated swales are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels, provide the opportunity for stormwater volume reduction through infiltration and evapotranspiration, reduce the flow velocity, and conveying stormwater runoff. An effective vegetated swale achieves uniform sheet flow through a densely vegetated area for a period of several minutes. The vegetation in the swale can vary depending on its location and is the choice of the designer, depending on the design criteria outlined in this section.



Vegetated swale captures flow from a residential street

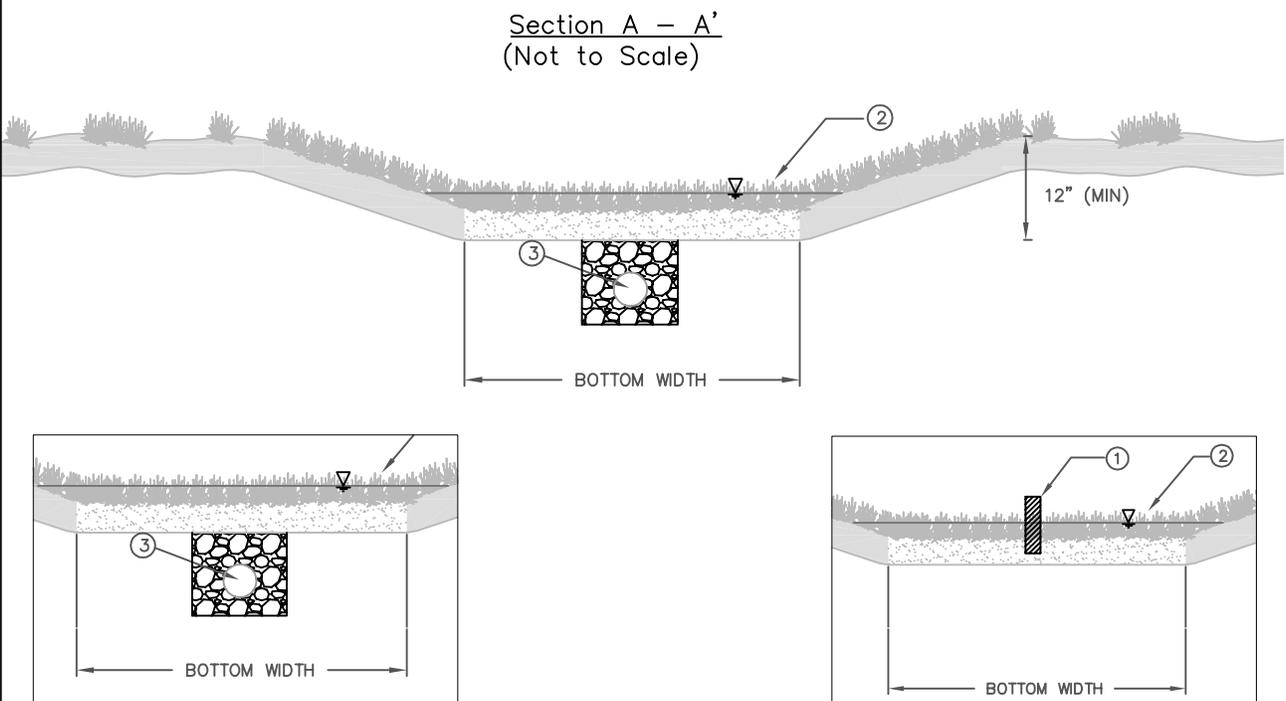
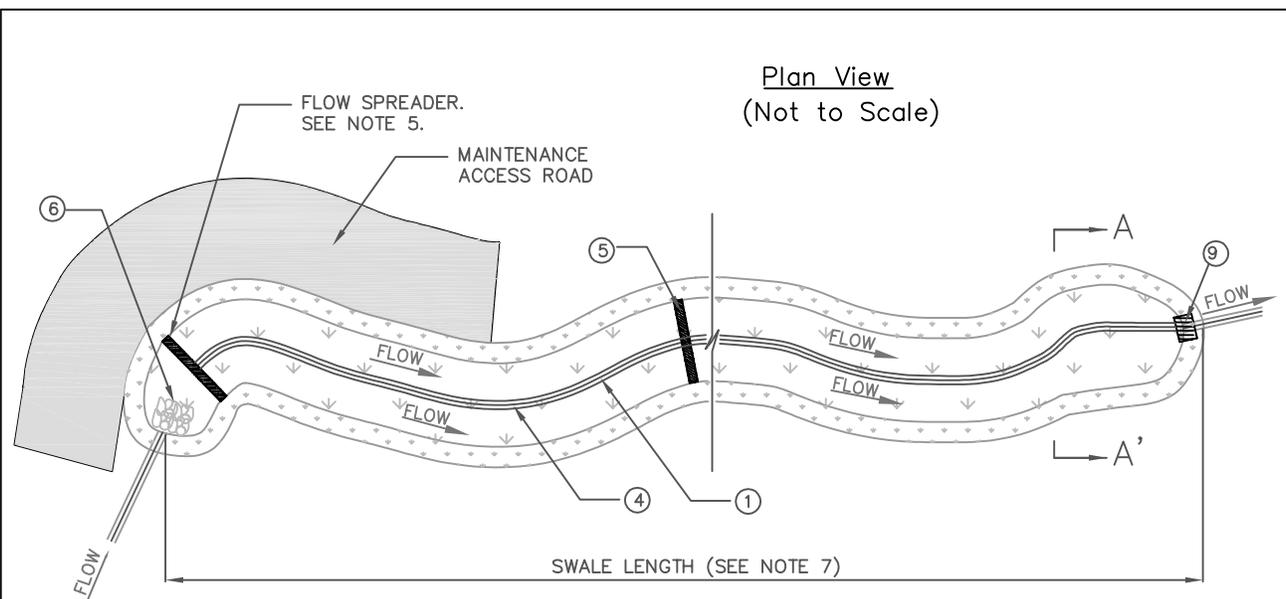
Photo Credit: Geosyntec Consultants

Application

- Open areas adjacent to parking lots
- Open spaces adjacent to athletic fields
- Roadway medians and shoulders

Preventative Maintenance

- Remove excess sediment, trash, and debris
- Clean and reset flow spreaders
- Mow regularly
- Remove sediment and debris build-up near inlets and outlets
- Repair minor erosion and scouring



NOTES:

- ① SWALE DIVIDER REQUIRED FOR BOTTOM WIDTHS > 10'. MINIMUM REQUIRED BOTTOM WIDTH IS 2' EXCLUDING WIDTH OF LOW FLOW CHANNEL. MAXIMUM BOTTOM WIDTH WITH DIVIDER IS 16'.
- ② DEPTH OF FLOW FOR WATER QUALITY TREATMENT MUST NOT EXCEED TWO-THIRDS OF VEGETATION HEIGHT OR NOT GREATER THAN 2" FOR FREQUENTLY MOWED TURF.
- ③ IF AN UNDERDRAIN IS REQUIRED, IT MUST CONSIST OF AN AT LEAST 6" DIAMETER PERFORATED PIPE IN COARSE AGGREGATE BED CONNECTED TO STORM DRAIN. GRAVEL BED MUST EXTEND 6" BELOW AND 12" TO THE SIDE AND TOP OF THE PIPE.
- ④ IF NO UNDERDRAIN, LOW FLOW DRAIN SHALL EXTEND ENTIRE LENGTH OF SWALE AND SHALL HAVE A DEPTH OF 6" MINIMUM AND WIDTH NO MORE THAN 5% SWALE BOTTOM WIDTH. ANCHORED PLATE FLOW SPREADER IF USED, SHALL HAVE V-NOTCHES (MAX TOP WIDTH = 5% OF SWALE WIDTH) OR HOLES TO ALLOW PREFERENTIAL EXIT OF LOW FLOWS.
- ⑤ INSTALL CHECK DAMS OR GRADE CONTROL STRUCTURES FOR SLOPES > 2% AT 50' MAXIMUM SPACING TO ACHIEVE A MAXIMUM EFFECTIVE LONGITUDINAL SLOPE OF 2%. FLOW SPREADERS SHALL BE PROVIDED AT INLET AND AT THE BASE OF EACH CHECK DAM.
- ⑥ INSTALL ENERGY DISSIPATOR AT THE INLET OF VEGETATED SWALE.
- ⑦ SWALE LENGTH SHALL LENGTH REQUIRED TO PROVIDE 7 MINUTES RESIDENCE TIME.
- ⑧ INSTALL APPROPRIATE OUTLET STRUCTURE. ACCOMMODATE LOW FLOW CHANNEL AND/OR UNDERDRAIN (IF PRESENT).
- ⑨ AMEND SOILS WITH 2" OF COMPOST TILLED INTO 6" OF NATIVE SOIL UNLESS NATIVE SOIL ORGANIC CONTENT > 10%.

<p>Figure 6-12: Vegetated Swale</p>	

Limitations

- 1) Compatibility with flood control - swales should not interfere with flood control functions of existing conveyance and detention structures.
- 2) Vegetation - select vegetation appropriately based on irrigation requirements and exposure (shady versus sunny areas). A thick vegetative cover is needed for vegetated swales to function properly. Native and drought tolerant plants are recommended.
- 3) Drainage area - each vegetated swale can treat a relatively small drainage area. Large areas should be divided and treated using multiple swales.

Design Criteria

Vegetated swales should be designed according to the requirements listed in Table 6-20 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-20: Vegetated Swale Filter Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design flow rate (SQDF)	cfs	See Section 2 and Appendix E for calculating SQDF.
Swale Geometry	-	Trapezoidal
Minimum bottom width	feet	2
Maximum bottom width	feet	10; if greater than 10 must use swale dividers; with dividers, max is 16
Minimum length	feet	sufficient length to provide minimum contact time
Minimum slope in flow direction	%	0.2 (provide underdrains for slopes less < 0.5%)
Maximum slope in flow direction	%	2.0 (provide grade-control checks for slopes > 2.0)
Maximum flow velocity	ft/sec	1.0 (water quality treatment); 3.0 (flood conveyance)
Maximum depth of flow for water quality treatment	inches	3 to 5 (1 inch below top of grass)
Minimum residence (contact) time	minutes	7 (provide sufficient length to yield minimum residence time)
Vegetation type	--	Varies (see vegetation section below); Native and drought tolerant plants are recommended
Vegetation height	inches	4 to 6 (trim or mow to maintain height)

Sizing Criteria

The flow capacity of a vegetated swale is a function of the longitudinal slope (parallel to flow), the resistance to flow (i.e. Manning's roughness), and the cross sectional area. The cross section is normally approximately trapezoidal and the area is a function of the bottom width and side slopes. The flow capacity of vegetated swales should be such that the SQDF will not exceed a flow depth of 2/3 the height of the vegetation within the swale or 4 inches at the SQDF. Once design criteria have been selected, the resulting flow depth for the SQDF is checked. If the depth restriction is exceeded, swale parameters (e.g. longitudinal slope, width) are adjusted to reduce the flow depth.

Procedures for sizing vegetated swales are summarized below. A vegetated swale sizing worksheet and example are also provided.

Step 1: Select design flows

The swale sizing is based on the SQDF (see [Section 2](#) and Appendix E).

Step 2: Calculate swale bottom width

The swale bottom width (b) is calculated based on Manning's equation for open-channel flow. This equation can be used to calculate discharges (Q) as follows:

$$Q = \frac{1.49AR^{0.67}S^{0.5}}{n} \quad \text{(Equation 6-27)}$$

Where:

Q	=	flow rate (cfs)
n	=	Manning's roughness coefficient (unitless)
A	=	cross-sectional area of flow (ft ²)
R	=	hydraulic radius (ft) = area divided by wetted perimeter
S	=	longitudinal slope (ft/ft)

For shallow flow depths in swales, channel side slopes are ignored in the calculation of bottom width. Use the following equation (a simplified form of Manning's formula) to estimate the swale bottom width (b):

$$b = \frac{SQDF * n_{wq}}{1.49y^{0.67} s^{0.5}} \quad \text{(Equation 6-28)}$$

Where:

b	=	bottom width of swale (ft)
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$SQDF$	=	stormwater quality design flow (cfs)
n_{wq}	=	Manning's roughness coefficient for shallow flow conditions = 0.2 (unitless)
y	=	design flow depth (ft)
s	=	longitudinal slope (along direction of flow) (ft/ft)

Proceed to Step 3 if the bottom width is calculated to be between 2 and 10 feet. A minimum 2-foot bottom width is required. Therefore, if the calculated bottom width is less than 2 feet, increase the width to 2 feet and recalculate the design flow depth y using the Equation 6-18, where $SQDF$, n_{wq} , and s are the same values as used above, but $b = 2$ feet.

The maximum allowable bottom width is 10 feet. Therefore, if the calculated bottom width exceeds 10 feet, then one of the following steps is necessary to reduce the design bottom width:

- 1) Increase the longitudinal slope (s) to a maximum of 2 feet in 100 feet (0.02 feet per foot).
- 2) Increase the design flow depth (y) to a maximum of 4 inches.
- 3) Place a divider lengthwise along the swale bottom (Figure 6-11) at least three-quarters of the swale length (beginning at the inlet), without compromising the design flow depth and swale lateral slope requirements. The swale width can be increased to an absolute maximum of 16 feet if a divider is provided.

Step 3: Determine design flow velocity

To calculate the design flow velocity (V_{wq}) through the swale, use the flow continuity equation:

$$V_{wq} = SQDF/A_{wq} \quad \text{(Equation 6-29)}$$

Where:

V_{wq}	=	design flow velocity (fps)
$SQDF$	=	stormwater quality design flow (cfs)
A_{wq}	=	$by + Zy^2$ = cross-sectional area (ft ²) of flow at design depth, where Z = side slope length per unit height (e.g., $Z = 3$ if side slopes are 3H:1V)

If the design flow velocity exceeds 1 foot per second, go back to Step 2 and modify one or more of the design parameters (longitudinal slope, bottom width, or flow depth) to

reduce the design flow velocity to 1 foot per second or less. If the design flow velocity is calculated to be less than 1 foot per second, proceed to Step 4. *Note: It is desirable to have the design velocity as low as possible, both to improve treatment effectiveness and to reduce swale length requirements.*

Step 4: Calculate swale length

Use the following equation to determine the necessary swale length (L) to achieve a hydraulic residence time of at least 7 minutes:

$$L = 60t_{hr}V_{wq} \quad \text{(Equation 6-30)}$$

Where:

L	=	minimum allowable swale length (ft)
t_{hr}	=	hydraulic residence time (min)
V_{wq}	=	design flow velocity (fps), calculated by Equation 6-19

If there is adequate space on the site to accommodate a larger swale, consider using a greater length to increase the hydraulic residence time and improve the swale's pollutant removal capability. If the calculated length is too long for the site, or if it would cause layout problems, such as encroachment into shaded areas, proceed to Step 5 to further modify the layout. If the swale length can be accommodated on the site (meandering may help), proceed to Step 6.

Step 5: Adjust swale layout to fit on site

If the swale length calculated in Step 4 is too long for the site, the length can be reduced (to a minimum of 100 feet) by increasing the bottom width up to a maximum of 16 feet, as long as the 10 minute retention time is retained. However, the length cannot be increased in order to reduce the bottom width because Manning's depth-velocity-flow rate relationships would not be preserved. If the bottom width is increased to greater than 10 feet, a low flow dividing berm is needed to split the swale cross section in half to prevent channelization.

Length can be adjusted by calculating the top area of the swale and providing an equivalent top area with the adjusted dimensions.

- 1) Calculate the swale treatment top area (A_{top}), based on the swale length calculated in Step 4:

$$A_{top} = (b_i + b_{slope})L_i \quad \text{(Equation 6-31)}$$

Where:

- A_{top} = top area (ft²) at the design treatment depth
- b_i = bottom width (ft), calculated in Step 2 using Equation 6-18
- b_{slope} = the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, $b_{slope} = 2$ feet)
- L_i = initial length (ft) calculated in Step 4 using Equation 6-30

- 2) Use the swale top area and a reduced swale length (L_f) to increase the bottom width, using the following equation:

$$L_f = A_{top} / (b_f + b_{slope}) \tag{Equation 6-32}$$

Where:

- L_f = reduced swale length (ft)
- b_f = increased bottom width (ft)

- 3) Recalculate V_{wq} according to Step 3 using the revised cross-sectional area A_{wq} based on the increased bottom width (b_f). Revise the design as necessary if the design flow velocity exceeds 1 foot per second.
- 4) Recalculate to ensure that the 10 minute retention time is retained.

Step 6: Provide conveyance capacity for flows higher than SQDF

Vegetated swales may be designed as flow-through channels that convey flows higher than the SQDF, or they may be designed to incorporate a high-flow bypass upstream of the swale inlet. A high-flow bypass usually results in a smaller swale size. If a high-flow bypass is provided, this step is not needed. If no high-flow bypass is provided, proceed with the procedure below. A flow splitter structure design is described in Appendix F.

- 1) Check the swale size to determine whether the swale can convey the flood control design storm peak flow (Refer to Ventura County Hydrology Manual, revised 2006).
- 2) The peak flow velocity of the flood control design storm (see Ventura County Hydrology Manual revised 2006) should be less than 3.0 feet per second. If this velocity exceeds 3.0 feet per second, return to Step 2 and increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.

Geometry and Size

- 1) In general, a trapezoidal channel shape should be assumed for sizing calculations above, but a more naturalistic channel cross-section is preferred.
- 2) Swales designed for water quality treatment purposes only are usually fairly shallow, generally less than 1 ft. Therefore, a side slope of 2:1 (H:V) can be used and is acceptable.
- 3) Swales shall be greater than 100 feet in length. The vegetated swale can be shorter than 100 feet if it is used for pretreatment only (i.e., prior to infiltration). Length can be increased by meandering the swale.
- 4) The minimum swale bottom width shall be 2 feet to allow for ease of mowing.
- 5) The maximum swale bottom width shall be limited to 10 feet, unless a swale divider is provided, then the maximum bottom width can be a maximum of 16 feet wide. The swale width is calculated without the swale diving berm. *The intention is that experience shows that when the width exceeds about 10 feet, it is difficult to keep the water from concentrating in low flow channels. It is also difficult to construct the bottom level without sloping to one side. Vegetated swales are best constructed by leveling the bottom after excavating. A single-width pass with a front-end loader produces a better result than a multiple-width pass.*
- 6) Swales that are required to convey flood flow as well as the SQDF should be sized to convey the flood control design storm and include a provision of freeboard as required by the local approval authority.
- 7) Gradual meandering bends in the swale are desirable for aesthetic purposes and to promote slower flow.

Bottom Slope

- 1) The longitudinal slope (along the direction of flow) should be between 1% and 6%.
- 2) If longitudinal slopes are less than 1.5% and the soils are poorly drained (e.g., silts and clays), then underdrains should be provided. A soils report to verify soils properties should be provided for swales less than 1.5%.
- 3) If longitudinal slope exceeds 2%, check dams with vertical drops of 12 inches or less should be provided to achieve a bottom slope of 2% or less between the drop structures.
- 4) The lateral (horizontal) slope at the bottom of the swale should be zero (flat) to discourage channeling.

Water Depth and Dry Weather Flow Drain

- 1) Water depth should not exceed 4 inches (or 2/3 of the expected vegetation height), except for frequently mowed turf swales, in which the depth should not exceed 2 inches.
- 2) The swale length must provide a minimum hydraulic residence time of 7 minutes.
- 3) A low flow drain should be provided if the potential for dry weather flows exists. The low flow drain should extend the entire length of the swale. The drain should have a minimum depth of 6 inches, and a width no more than 5% of the calculated swale bottom width. The width of the drain should be in addition to the required bottom width. The flow spreader at the swale inlet should have v-notches (maximum top width = 5% of swale width) or holes to allow preferential exit of low flows into the drain, if applicable. If an underdrain or gravel drainage layer is installed as discussed below, the low flow drain should be omitted.

Swale Inflow and Design Capacity

- 1) Whenever possible, inflow should be directed towards the upstream end of the swale and should, at a minimum, occur evenly over the length of the swale. Swale inflow design should provide for positive drainage into the swale to function on the long-term with minimal maintenance.
- 2) On-line vegetated swales should be designed to convey flow rates up to the post-development peak stormwater runoff discharge rate (flow rate) for the 100-yr 24-hour storm event, with appropriate freeboard (see Ventura County Hydrology Manual, revised 2006).
- 3) Off-line vegetated swales should be designed to convey the flow-based SQDF by using a flow diversion structure (e.g., flow splitter) which diverts the SQDF to the off-line vegetated swale designed to handle SQDF. Freeboard for off-line swales is not required, but should be provided if space is available. Flow splitter design specifications are described in Appendix F.

Energy Dissipation

- 1) Vegetated swales may be designed either on-line or off-line. If the facility is on-line, velocities should be maintained below the maximum design flow velocity of 3 feet per second to prevent scour and resuspension of deposited sediments.
- 2) The maximum flow velocity under the stormwater quality design flow rate should not exceed 1.0 foot per second. *The intention is that this maximum SQDV promotes settling and keeps vegetation upright.*
- 3) This velocity limitation combined with a maximum depth of 4 inches and bottom width of 10 feet results in a recommended maximum flow capacity of about 3.3 cfs,

- after accounting for the side slopes. The contributory drainage area to each swale is limited so as not to exceed this recommended maximum flow capacity.
- 4) The maximum flow velocity during the 100-yr 24-hr storm event should not exceed 3.0 foot per second. This can be accomplished by:
 - a. Splitting roadside swales near high points in the road so that flows drain in opposite directions, mimicking flow patterns on the road surface.
 - b. Limiting tributary areas to long swales by diverting flows throughout the length of the swale at regular intervals, to the downstream stormwater conveyance system.
 - 5) A flow spreader (see “Flow Spreaders” below) should be used at the inlet so that the entrance velocity is quickly dissipated and the flow is uniformly distributed across the whole swale. Energy dissipation controls should be constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flows.
 - 6) If check dams are used to reduce the longitudinal slope, a flow spreader should be provided at the toe of each vertical drop, with specifications described below.
 - 7) If flow is to be introduced through curb cuts, place pavement approximately one inch above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

Flow Spreaders

- 1) An anchored plate flow spreader or similar device should be provided at the inlet to the swale. Equivalent methods for spreading flows evenly throughout the width of the swale are acceptable.
- 2) The top surface of the flow spreader plate should be level, projecting a minimum of 2 inches above the ground surface of the water quality facility, or v-notched with notches 6 to 10 inches on center and 1 to 4 inches deep (use shallower notches with closer spacing).
- 3) A flow spreader plate should extend horizontally beyond the bottom width of the facility to prevent water from eroding the side slope. The plate should have a row of horizontal perforations at its base to prevent ponding for long durations. The horizontal extent should be such that the bank is protected for all flows up to the 100-yr 24-hr storm event (on-line swales) or the maximum flow that will enter the water quality facility (off-line swales).
- 4) Flow spreader plates should be securely fixed in place.
- 5) Flow spreader plates may be made of either concrete, stainless steel, or other durable material.

- 6) Anchor posts should be 4-inch square concrete, tubular stainless steel, or other material resistant to decay.

Check Dams

If check dams are required, they can be designed using a number of different materials, including riprap, earthen berms, or removal stop logs. Where vegetated swales parallel urban streets, the check dam can double as a crossing walk so that pedestrians have a pathway from the parked car to the building.

Check dams must be placed as to achieve the desired slope (1 to 6%) at a maximum of 50 feet apart. Check dams should be no higher than 12 inches. If riprap is used, the material should consist of well-graded stone consisting of a mixture of rock sizes. The following is an example of an acceptable gradation:

Particle Size	% Passing
24 inch	100
15 inch	75
9 inch	50
4 inch	10

Underdrains

If underdrains (not to be confused with a dry weather flow drain) are required, then they should meet the following criteria:

- 1) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*
- 2) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of opening per linear foot of pipe.
- 3) Underdrains should be sloped at a minimum of 0.5%.
- 4) The underdrain pipe should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. Clean-out risers with diameters equal to the underdrain pipe should be placed at the terminal ends of the underdrain and can be incorporated into the flow spreader and outlet structure to minimize maintenance obstacles in the swale. Intermediate clean-out risers may also be placed in the check dams or grade control structures. The cleanout risers should be capped with a lockable screw cap.

- 5) The underdrain should be placed parallel to the swale bottom and backfilled and underbedded with six inches of drain rock. The following coarse aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

- 6) At the option of the designer/geotechnical engineer, the drain rock may be wrapped in a geotextile fabric meeting the following minimum materials requirements. If a geotextile fabric is used, it should pass 75 gal/min/ft², should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of geotextile fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

- 7) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, daylight to a vegetated dispersion area using an effective flow dispersion device, stored for rainwater harvesting, or to a storm drain.

Gravel Drainage Layer

To increase volume reduction and if soil conditions allow (infiltration rate > 0.5 in/hr), omit the low flow drain or underdrain and install an appropriately sized gravel drainage layer (typically a washed 57 stone) beneath the swale to achieve desired volume reduction goals. Where slopes are greater than 1%, the gravel drainage layer should be installed in combination with check dams (e.g., drop structures) to slow the flow in the swale and allow for infiltration into the gravel drainage layer and then into the subsurface. The base of the drainage layer should have zero slope. The drawdown time in the gravel drainage layer should not exceed 72 hours. The soil and gravel layers should

be separated with a geotextile filter fabric or a thin, 2 to 4 inch layer of pure sand and a thin layer (nominally two inches) of choking stone (such as #8). Sizing of the gravel drainage layer is based on volume reduction requirements.

Swale Divider

- 1) If a swale divider is used, the divider should be constructed of a firm material that will resist weathering and not erode, such as concrete, plastic, or compacted soil seeded with grass. Treated timber should not be used. Selection of divider material should take into account maintenance activities, such as mowing.
- 2) The divider should have a minimum height of 1 inch greater than the stormwater quality design water depth.
- 3) Earthen berms should be no steeper than 2H:1V.
- 4) Material other than earth should be embedded to a depth sufficient to be stable.

Soils

Swale soils should be amended with 2 inches of compost, unless the organic content is already greater than 10%. The compost should be mixed into the native soils to a depth of 6 inches to prevent soil layering and washout of compost. The compost will contain no sawdust, green or under-composted material, or any other toxic or harmful substance. It should contain no un-sterilized manure, which can lead to high levels of pathogen indicators (coliform bacteria) in the runoff.

Vegetation

Swales must be vegetated in order to provide adequate treatment of runoff via filtration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. It is important to maximize water contact with vegetation and the soil surface.

- 1) The swale area should be appropriately vegetated with a mix of erosion-resistant plant species that effectively bind the soil. A diverse selection of low growing plants that thrive under the specific site, climatic, and watering conditions should be specified. A mixture of dry-area and wet-area grass species that can continue to grow through silt deposits is most effective. Native or adapted grasses are preferred because they generally require less fertilizer, limited maintenance, and are more drought-resistant than exotic plants. When appropriate, swales that are integrated within a project may use turf or other more intensive landscaping, while swales that are located on the project perimeter, within a park, or close to an open space area are encouraged to be planted with a more naturalistic plant palette.
- 2) Trees or shrubs may be used in the landscape as long as they do not over-shade the turf.

- 3) Above the design treatment elevation, a typical lawn mix or landscape plants can be used provided they do not shade the swale vegetation.
- 4) Irrigation is required if the seed is planted in the spring or summer. Use of a permanent irrigation system may help provide maximal water quality performance. Drought-tolerant grasses should be specified to minimize irrigation requirements.
- 5) Vegetative cover should be at least 4 inches in height, ideally 6 inches. Swale water depth should ideally be $2/3$ of the height of the shortest plant species.
- 6) Locate the swale in an area without excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.
- 7) Locate the swale away from large trees that may drop excessive leaves or needles, which may smother the grass or impede the flow through the swale. Landscape planter beds should be designed and located so that soil does not erode from the beds and enter a nearby swale.

Maintenance Access

- 1) Access to the swale inlet and outlet should be safely provided, with ample room for maintenance and operational activities.

Operations and Maintenance

- 1) Inspect vegetated swales for erosion or damage to vegetation after every storm greater than 0.75 inches for on-line swales and at least twice annually for off-line swales, preferably at the end of the wet season to schedule summer maintenance and in the fall to ensure readiness for winter. Additional inspection after periods of heavy runoff is recommended. Each swale should be checked for debris and litter and areas of sediment accumulation (see Appendix I for a vegetated swale inspection and maintenance checklist).
- 2) Swale inlets (curb cuts or pipes) should maintain a calm flow of water entering the swale. Remove sediment as needed at the inlet, if vegetation growth is inhibited in greater than 10% of the swale or if the sediment is blocking even distribution and entry of the water. Following sediment removal activities, replanting and/or reseeding of vegetation may be required for reestablishment.
- 3) Flow spreaders should provide even dispersion of flows across the swale. Sediments and debris should be removed from the flow spreader if blocking flows. Splash pads should be repaired if needed to prevent erosion. Spreader level should be checked and leveled if necessary.
- 4) Side slopes should be maintained to prevent erosion that introduces sediment into the swale. Slopes should be stabilized and planted using appropriate erosion control measures when native soil is exposed or erosion channels are formed.

- 5) Swales should drain within 48 hours of the end of a storm. Till the swale if compaction or clogging occurs and revegetate. If a perforated underdrain pipe is present, it should be cleaned if necessary.
- 6) Vegetation should be healthy and dense enough to provide filtering, while protecting underlying soils from erosion:
 - Mulch should be replenished as needed to ensure survival of vegetation.
 - Vegetation, large shrubs or trees that interfere with landscape swale operation should be pruned.
 - Fallen leaves and debris from deciduous plant foliage should be removed.
 - Grassy swales should be mowed to 4 to 6 inches height. Grass clippings should be removed.
 - Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 10% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
 - Dead vegetation should be removed if greater than 10% of area coverage or when swale function is impaired. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.
- 7) Check dams (if present) should control and distribute flow across the swale. Causes for altered water flow and/or channelization should be identified and obstructions cleared. Check dams and swale should be repaired if damaged.
- 8) The vegetated swale should be well maintained. Trash and debris, sediment, visual contamination (e.g., oils), noxious or nuisance weeds, should all be removed.

BIO-4: Vegetated Filter Strip

Filter strips are vegetated areas designed to treat sheet flow runoff from adjacent impervious surfaces or intensive landscaped areas such as golf courses. Filter strips decrease runoff velocity, filter out total suspended solids and associated pollutants, and provide some infiltration into underlying soils. While some assimilation of dissolved constituents may occur, filter strips are generally more effective in trapping sediment and particulate-bound metals, nutrients, and pesticides. Filter strips are more effective when the runoff passes through the vegetation and thatch layer in the form of shallow, uniform flow. Biological and chemical processes may help break down pesticides, uptake metals, and use nutrients that are trapped in the filter.



Vegetated filter strip captures runoff from freeway

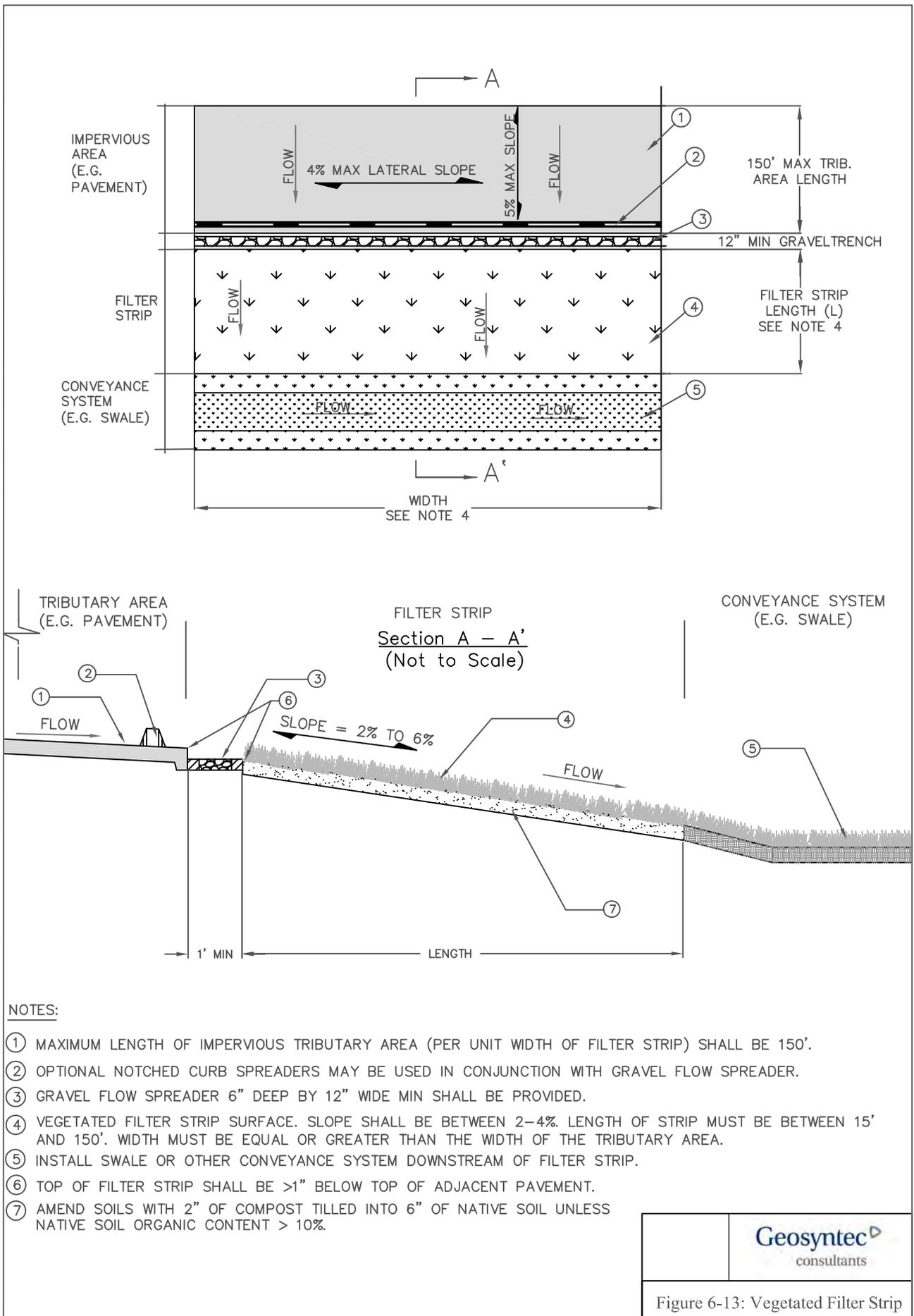
Photo Credit: Washington Department of Transportation

Applications

- Areas adjacent to parking lots and driveways
- Road medians and shoulders

Preventative Maintenance

- Remove excess sediment
- Stabilize/repair minor erosion and scouring
- Remove trash and debris
- Mow regularly



Limitations

The following describes limitations for vegetated filter strips:

- High flow velocity - steep terrain and/or large tributary area may cause concentrated, erosive flows.
- Sheet flow - shallow, evenly-distributed flow across the entire width of the filter strip is required. Filter strips are designed to treat small areas. The maximum flow path from a contributing impervious surface should not exceed 150 feet. Flows should enter as sheet flow and not exceed a depth of 1 inch.
- Shallow grades – a limited site slope may cause ponding.
- Availability of pervious area adjacent to impervious area - filter strips require sheet flow from impervious areas.

Design Criteria

The main challenge associated with filter strips is maintaining sheet flow, which is critical to the performance of this BMP. If flows are concentrated, then little or no treatment of stormwater runoff is achieved and erosive rilling is likely. The use of a flow spreading device (e.g., gravel trench or level spreader) to deliver shallow, evenly-distributed sheet flow to the strip is required. Vegetated filter strips should be designed according to the requirements listed in Table 6-21 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-21: Vegetated Filter Strip Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design flow (SQDF)	cfs	See Section 2 and Appendix E for calculating SQDF.
Maximum design flow depth	inches	1
Design residence time	minutes	7
Design flow velocity	ft/sec	< 1 ft/sec
Minimum length in flow direction	feet	15 (25 preferred); If sized for pretreatment only, filter strip can be a minimum of 4.
Maximum length (parallel to flow) of tributary area per unit width (perpendicular to flow) of filter strip	feet	150
Minimum slope in flow direction	%	2

Design Parameter	Unit	Design Criteria
Maximum slope in flow direction	%	4
Maximum lateral slope	%	4
Vegetation	-	Turf grass (irrigated) or approved equal
Minimum grass height	inches	2
Maximum grass height	inches	4 (typical) or as required to prevent shading
Elevation of flow spreader	inches	> 1 inch below the pavement surface

Sizing Criteria

The flow capacity of a vegetated filter strips (filter strips) is a function of the longitudinal slope (parallel to flow), the resistance to flow (e.g., Manning’s roughness), and the width and length of the filter strip. The slope should be shallow enough to ensure that the depth of water will not exceed 1 inch over the filter strip. Similarly, the flow velocity should be less than 1 ft/sec. Procedures for sizing filter strips are summarized below. A filter strip sizing example is also provided.

Step 1: Calculate the design flow rate

The design flow is calculated based on the SQDF (see Section 2).

Step 2: Calculate the minimum width

Determine the minimum width (W_{min}), perpendicular to flow, allowable for the filter strip and design for that width or larger.

$$W_{min} = (SQDF) / (q_{a,min}) \tag{Equation 6-33}$$

Where

W_{min} = minimum width of filter strip (and tributary area)

$SQDF$ = design flow (cfs)

$q_{a,min}$ = minimum linear unit application rate, 0.005 cfs/ft

Step 3: Calculate the design flow depth

The design flow depth (d_f) is calculated based on the width and the slope, parallel to the flow path, using a modified Manning’s equation as follows:

$$d_f = 12 \times [SQDF * n_{wq} / 1.49W_{trib} s^{0.5}]^{0.6} \tag{Equation 6-34}$$

Where:

d_f	=	design flow depth (inches)
$SQDF$	=	design flow (cfs)
W	=	width of strip (perpendicular to flow = width of impervious surface contributing area (ft))
s	=	slope (ft/ft) of strip parallel to flow, average over the whole width
n_{wq}	=	Manning's roughness coefficient (0.25-0.30)

If d_f is greater than 1 inch (0.083 ft), then a shallower slope is required, or a filter strip cannot be used.

Step 4: Calculate the design velocity

The design flow velocity (V_{wq}) is based on the design flow, design flow depth, and width of the strip:

$$V_{wq} = SQDF / (d_f W) \quad \text{(Equation 6-35)}$$

Where:

$d_{f,ft}$	=	design flow depth (ft) ($d_f/12$)
$SQDF$	=	stormwater quality design flow (cfs)
W	=	width of strip (perpendicular to flow = width of impervious surface contributing area (ft))

Step 5: Calculate the desired length of the filter strip

Determine the required length (L) to achieve a desired minimum residence time of 7 minutes using:

$$L = 60t_{hr} * V_{wq} \quad \text{(Equation 6-36)}$$

Where:

L	=	minimum allowable strip length (ft)
t_{hr}	=	hydraulic residence time (min)
V_{wq}	=	design flow velocity (fps) calculated by Equation 6-35

Geometry and Size

- 1) The width of the filter strip shall extend across the full width of the tributary area. The upstream boundary of the filter should be located contiguous to the developed tributary area.
- 2) The length (in direction of flow) should be between 15 and 150 feet. A minimum length of 25 feet is preferred. Filter strips used for pretreatment shall be at least 4 feet long (in direction of flow).
- 3) Filter strips shall be designed on slopes (parallel to the direction of flow) between 2% and 4%; steeper slopes tend to result in concentrated flow. Slopes less than 2% could pond runoff, and in poorly permeable soils, create a mosquito breeding habitat.
- 4) The lateral slope of strip (parallel to the edge of the pavement, perpendicular to the direction of flow) should be 4% or less.
- 5) Grading should be even: a filter strip with uneven grading perpendicular to the flow path will develop flow channels over time.
- 6) The top of the strip should be installed 2 to 5 inches below the adjacent pavement to allow for vegetation and sediment accumulation at the edge of the strip. A beveled transition is acceptable and may be required per roadside design specifications.
- 7) Both the top and toe of the slope should be as flat as possible to encourage sheet flow and prevent channeling and erosion. For engineered filter strips, the facility surface should be graded flat prior to placement of vegetation.

Energy Dissipation / Level Spreading

Runoff entering a filter strip must not be concentrated. A flow spreader should be installed at the edge of the pavement to uniformly distribute the flow along the entire width of the filter strip.

- 1) At a minimum, a gravel flow spreader (gravel-filled trench) should be placed between the impervious area contributing flows and the filter strip, and meet the following requirements:
 - a. The gravel flow spreader should be a minimum of 6 inches deep and should be 12 inches wide.
 - b. The gravel should be a minimum of 1 inch below the pavement surface. *The intention is that this allows sediment from the paved surface to be accommodated without blocking drainage onto the strip.*
- 2) The gravel flow spreader should be a minimum of 6 inches deep and should be 12 inches wide.

- a. Where the ground surface is not level, the gravel spreader must be installed so that the bottom of the gravel trench and the outlet lip are level.
 - b. Along roadways, gravel flow spreaders must be placed and designed in accordance with County road design specifications for compacted road shoulders.
- 3) Curb ports and interrupted curbs may only be used in conjunction with a gravel spreader to better ensure that water sheet flows onto the strip, provided:
- a. Curb ports use fabricated openings that allow concrete curbing to be poured or extruded while still providing an opening through the curb to admit water to the filter strip. Interrupted curbs are sections of curb placed to have gaps spaced at regular intervals along the total width of the treatment area. Openings or gaps in the curb should be at regular intervals but at least every 6 feet. The width of each opening should be a minimum of 11 inches.
 - b. At a minimum, gaps should be every 6 feet to allow distribution of flows into the treatment facility before they become too concentrated. The opening should be a minimum of 11 inches. Approximately 15 percent or more of the curb section length should be in open ports, and as a general rule, no opening should discharge more than 10 percent of the overall flow entering the facility.
- 4) Energy dissipaters are needed in a filter strips if sudden slope drops occur, such as locations where flows in a filter strip pass over a rockery or retaining wall aligned perpendicular to the direction of flow. Adequate energy dissipation at the base of a drop section can be provided by a riprap pad.

Access

- 1) Access should be provided at the upper edge of a filter strip to enable maintenance of the inflow spreader throughout the strip width and allow access for mowing equipment.

Water Depth and Velocity

- 1) The design water depth shall not exceed 1 inch.
- 2) Runoff flow velocities should not exceed approximately 1 foot per second across the filter strip surface.

Soils

Filter strip soils should be amended with 2 inches of compost, unless the organic content is already greater than 10%. The compost should be mixed into the native soils to a depth of 6 inches to prevent soil layering and washout of compost. The compost will contain no sawdust, green or under-composted material, or any other toxic or harmful substance. It

should contain no un-sterilized manure which can lead to high levels of potentially pathogenic bacteria in the runoff.

Vegetation

Filter strips must be uniformly graded and densely vegetated with erosion-resistant grasses that effectively bind the soil. Native or adapted grasses are preferred because they generally require less fertilizer and are more drought-resistant than exotic plants. The following vegetation guidelines should be followed for filter strips:

- 1) Sod (turf) can be used instead of grass seed, as long as there is complete coverage.
- 2) Irrigation should be provided to establish the grasses.
- 3) Grasses or turf should be maintained at a height of 2 to 4 inches. Regular mowing is often required to maintain the turf grass cover.
- 4) Trees or shrubs should not be used in abundance because they shade the turf and impede sheet flow.

Operations and Maintenance

Filter strips mainly require vegetation management. Therefore little special training is needed for maintenance crews. Typical maintenance activities and frequencies include:

- 1) Inspect strips at least twice annually for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and in the fall to ensure the strip is ready for winter. However, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for debris and litter and areas of sediment accumulation (see Appendix I for a vegetated filter strip inspection and maintenance checklist).
- 2) Mow as frequently as necessary (at least twice a year) for safety and aesthetics or to suppress weeds and woody vegetation.
- 3) Trash tends to accumulate in strip areas, particularly along roadways. The need for litter removal should be determined through periodic inspection. Litter should always be removed prior to mowing.
- 4) Regularly inspect vegetated buffer strips for pools of standing water. Vegetated filter strips can become a nuisance due to mosquito breeding in level spreaders (unless designed to dewater completely in less than 72 hours), in pools of standing water if obstructions develop (e.g. debris accumulation, invasive vegetation), and/or if proper drainage slopes are not implemented and maintained.
- 5) Activities that lead to ruts or depressions on the surface of the filter strip should be prevented or the integrity of the strip should be restored by leveling and reseeded. Examples are vehicle tracks, utility maintenance, and pedestrian (short-cut) tracks.

- 6) Vegetation should be healthy and dense enough to provide filtering, while protecting underlying soils from erosion:
- Mulch should be replenished as needed to ensure survival of vegetation.
 - Vegetation, large shrubs or trees that interfere with landscape swale operation should be pruned.
 - Fallen leaves and debris from deciduous plant foliage should be removed.
 - Filter strips should be mowed to 4 to 6 inches height. Grass clippings should be removed.
 - Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 10% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
 - Dead vegetation should be removed if greater than 10% of area coverage or when filter strip function is impaired. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

BIO-5: Proprietary Biotreatment

Proprietary biotreatment devices are manufactured treatment BMPs that incorporate plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their non-proprietary counterparts. Incoming flows are typically pretreated to remove larger particles/debris, filtered through a planting media (mulch, compost, soil, and plants), collected by an underdrain, and delivered to the stormwater conveyance system.



Application

- Parking lot islands
- Pickup/drop off turnarounds
- Roadway curbs

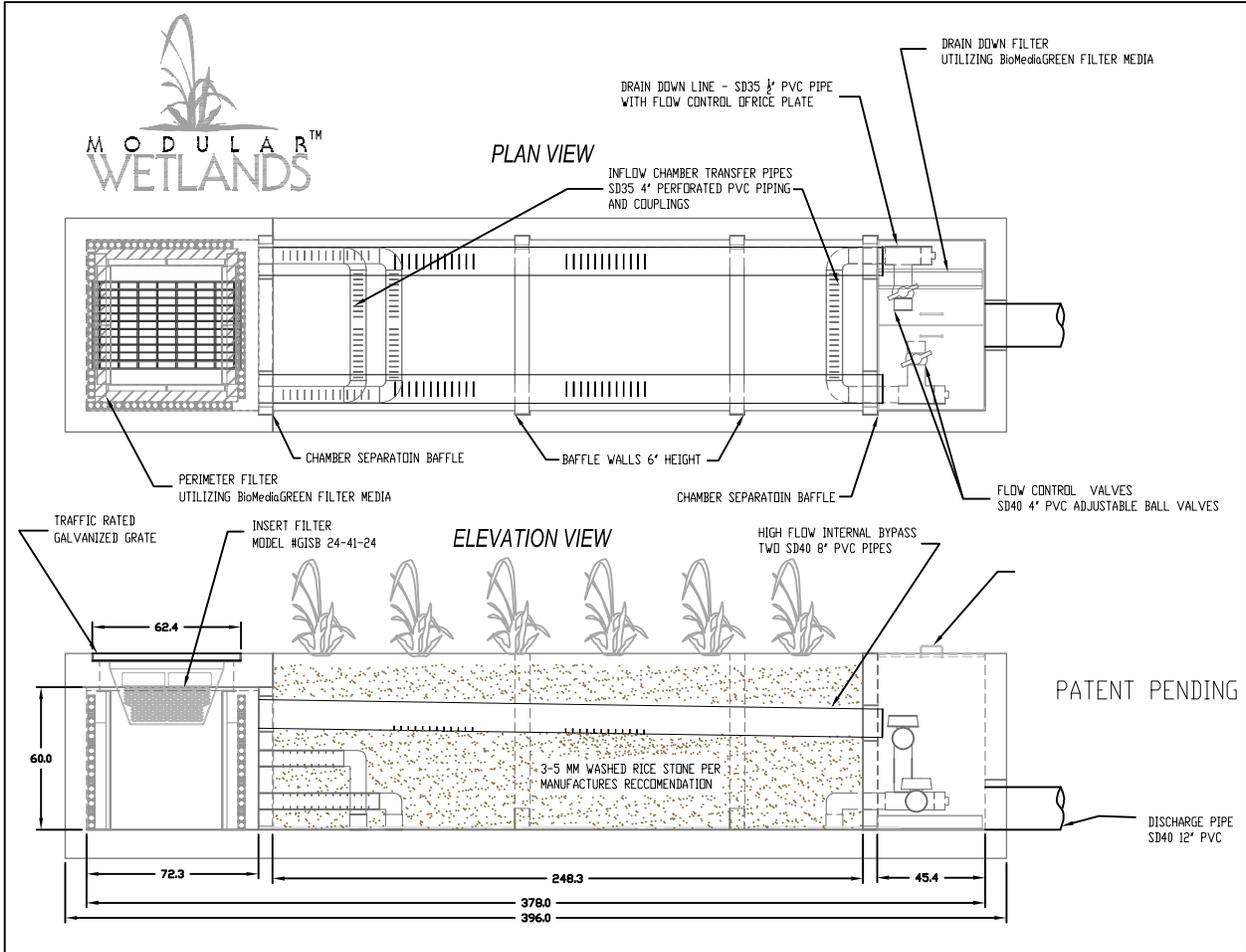
Maintenance

- Filter media replacement
- Sediment, trash, and debris removal
- Mulch replacement
- Vegetation upkeep and replacement

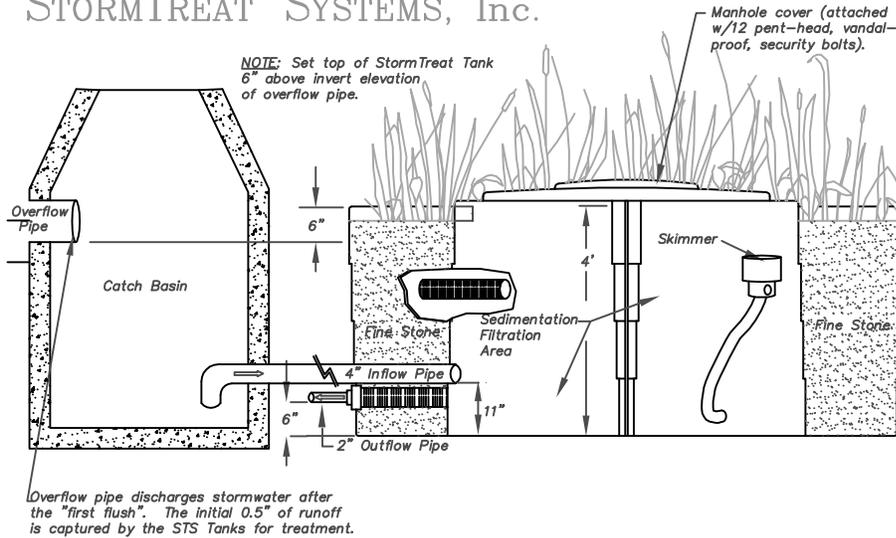


Proprietary Biotreatment Examples

Photo Credits: 1. Filterra®; 2. Stormtreat™



STORMTREAT™ SYSTEMS, Inc.



Geosyntec
consultants

Figure 6-14: Biotreatment Device

Table 6-22: Proprietary Biotreatment Device Manufacturer Websites

Device	Manufacturer	Website
DeepRoot® Silva Cell	DeepRoot® Urban Landscape Products	www.deeproot.com
Filtterra®	Filtterra® Bioretention Systems	www.filtterra.com
Modular Wetlands (MWS-LINEAR)	Modular Wetlands Systems Inc.	www.modularwetlands.com
StormTreat™	StormTreat Systems Inc.	www.stormtreat.com
UrbanGreen BioFilter	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13

Design Criteria

As proprietary biotreatment BMP vendors are constantly updating and expanding their product lines, refer to the specific vendor for the latest design and sizing guidance.

TCM-1: Dry Extended Detention Basin

Dry extended detention (ED) basins are basins whose outlets have been designed to detain the SQDV for 36 to 48 hours to allow sediment particles and associated pollutants to settle and be removed. Dry ED basins do not have a permanent pool. They are designed to drain completely between storm events. They can also be used to provide hydromodification and/or flood control by modifying the outlet control structure and providing additional detention storage. The slopes, bottom, and forebay of dry ED basins are typically vegetated. Without the addition of a sand filter beneath the basin, considerable stormwater volume reduction can still occur, depending on the infiltration capacity of the subsoil.



Extended Detention Basin Application

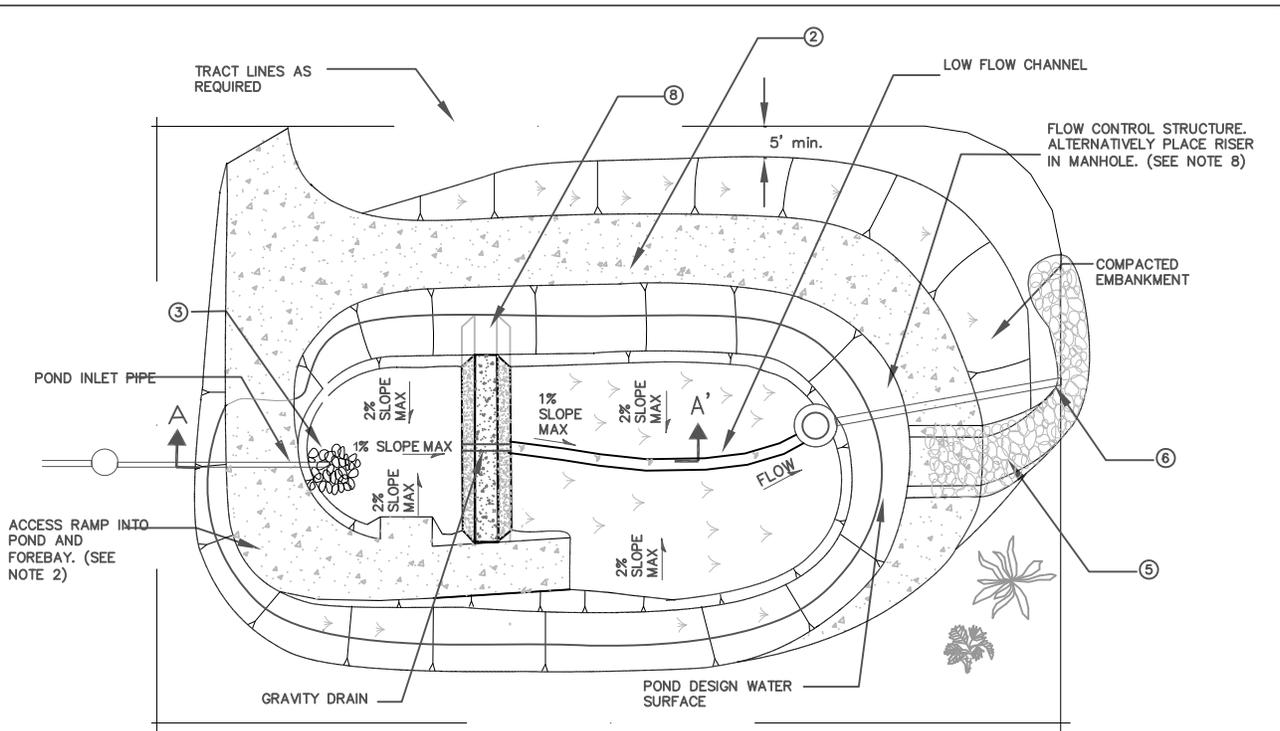
Photo Credit: Geosyntec Consultants

Application

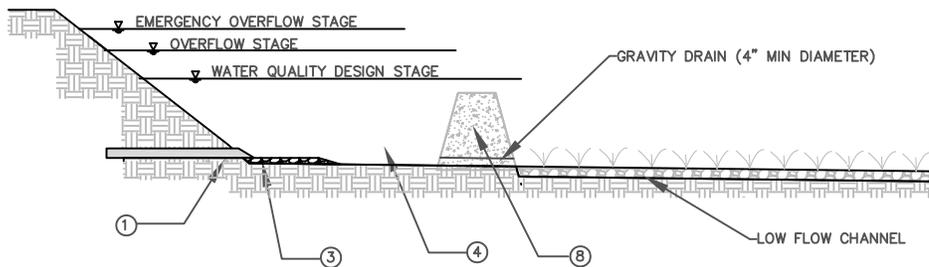
- Adjacent to parking lots
- Road medians and shoulders
- Within open areas or play fields

Preventative Maintenance

- Remove trash and debris, minor sediment accumulation, and obstructions near inlet and outlet structures
- Replace top 2 to 4 inch of sand
- Mow or weed surface of filter



Plan View
(Not to Scale)



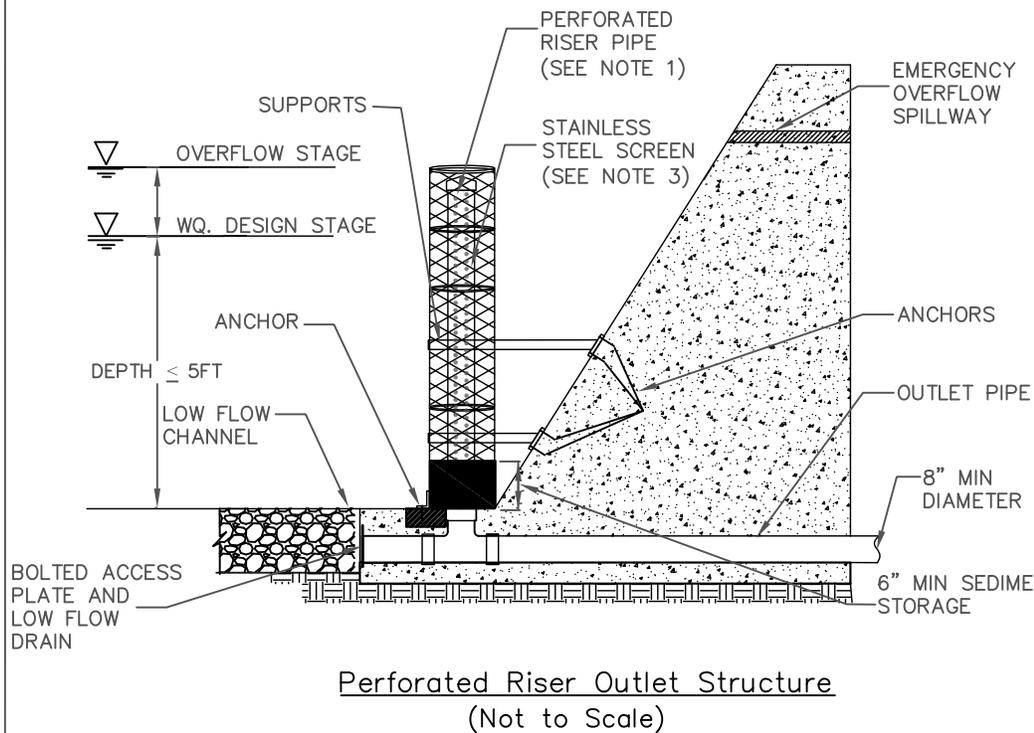
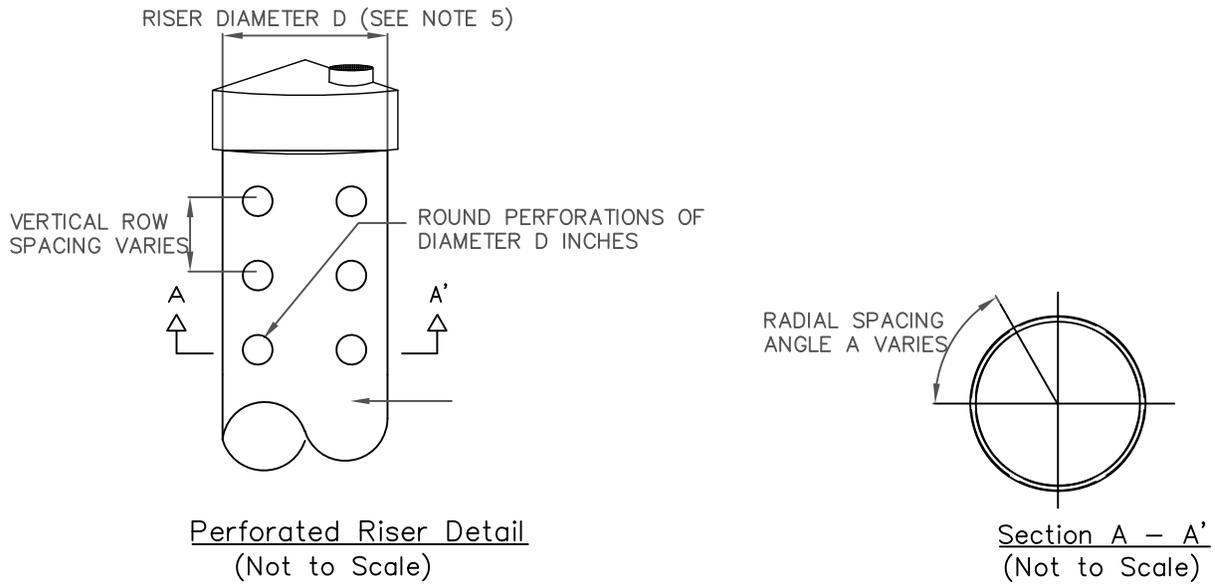
Section A - A'
(Not to Scale)

NOTES:

- ① INLET PIPE SHALL BE DESIGNED AND LOCATED SO THAT NON-EROSIVE VELOCITIES OCCUR IN THE FOREBAY
- ② MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FOREBAY AND MAIN BASIN.
- ③ RIP RAP APRON OR OTHER INLET ENERGY DISSIPATION SHALL BE PROVIDED SUCH THAT VELOCITIES IN THE FOREBAY ARE < 4 FT/S.
- ④ SEDIMENT FOREBAY SHOULD BE SIZED TO PROVIDE 5-15% OF THE TOTAL BASIN VOLUME.
- ⑤ EMERGENCY SPILLWAY MUST BE SIZED TO PASS 100-YEAR PEAK FLOW FOR ON-LINE BASINS, AND WATER QUALITY DESIGN FLOW FOR OFF-LINE BASINS.
- ⑥ OUTLET PIPE. ENERGY DISSIPATION SHALL BE PROVIDED UNLESS DISCHARGE IS TO PIPE OR HARDENED CHANNEL.
- ⑦ OUTLET STRUCTURE SHOULD BE SIZED TO DRAIN WATER QUALITY VOLUME IN 36 - 48 HOURS (SEE FIGURE 2-2 FOR PERFORATED RISER DETAILS). ALTERNATIVELY PLACE RISER STRUCTURE IN A MANHOLE (SEE FIGURE 2-3).
- ⑧ INSTALL EARTHEN BERM OR EQUIVALENT. TOP OF BERM SHALL BE 2' MINIMUM BELOW DESIGN WATER QUALITY STAGE. BERM SHALL BE KEYED INTO EMBANKMENT A MINIMUM OF 1' ON BOTH SIDES.

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Figure 6-15: Extended Detention Basin

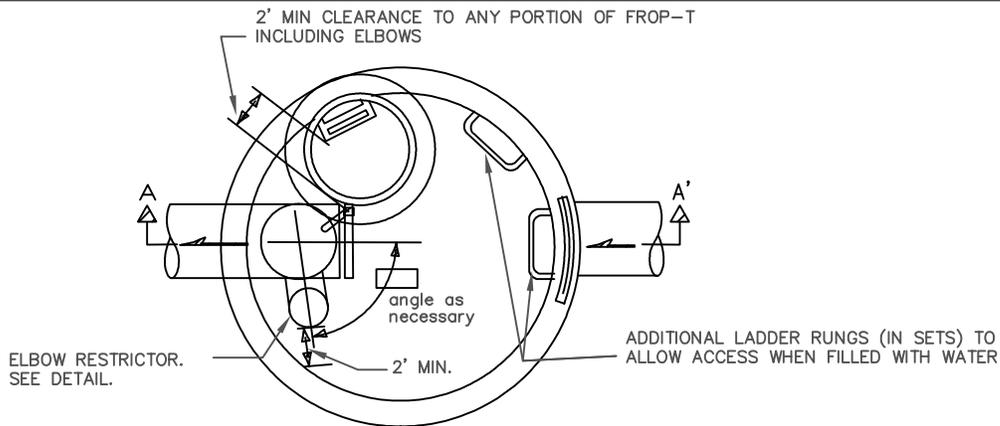


NOTES:

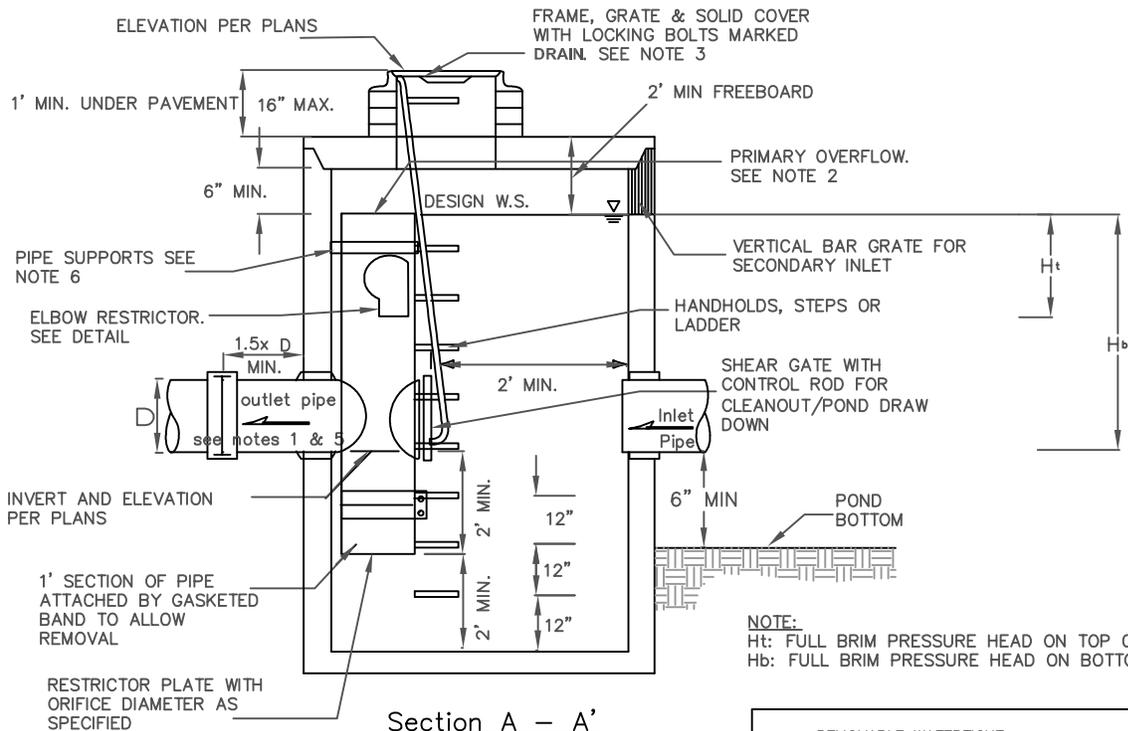
- ① RISER PIPE SHALL BE SIZED TO PROVIDE 36 TO 48-HOUR FULL BRIM DRAW DOWN TIME.
- ② TOTAL OUTLET CAPACITY: 100-YEAR PEAK FLOW FOR ON-LINE BASINS AND WATER QUALITY DESIGN FLOW FOR OFF-LINE BASINS.
- ③ SCREEN OPENINGS SHALL BE AT LEAST 1/4" AND SHALL NOT EXCEED THE DIAMETER OF THE PERFORATIONS ON THE RISER.
- ④ RISER PIPE PERFORATION DIAMETER SHALL BE NO LESS THAN 1/2" AND NO MORE THAN 2"
- ⑤ MINIMUM PIPE DIAMETER (D) IS 2'
- ⑥ RISER PIPE MATERIAL IS CMP



Figure 6-16: Perforated Riser Outlet

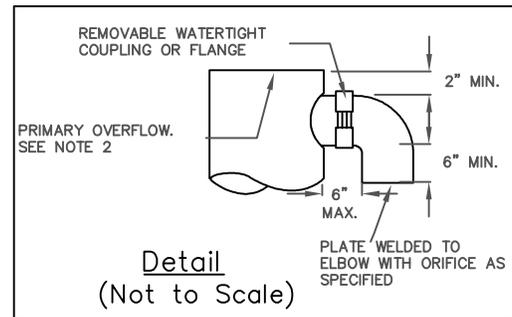


Plan View
(Not to Scale)



Section A - A'
(Not to Scale)

NOTE:
Ht: FULL BRIM PRESSURE HEAD ON TOP ORIFICE
Hb: FULL BRIM PRESSURE HEAD ON BOTTOM ORIFICE



Detail
(Not to Scale)

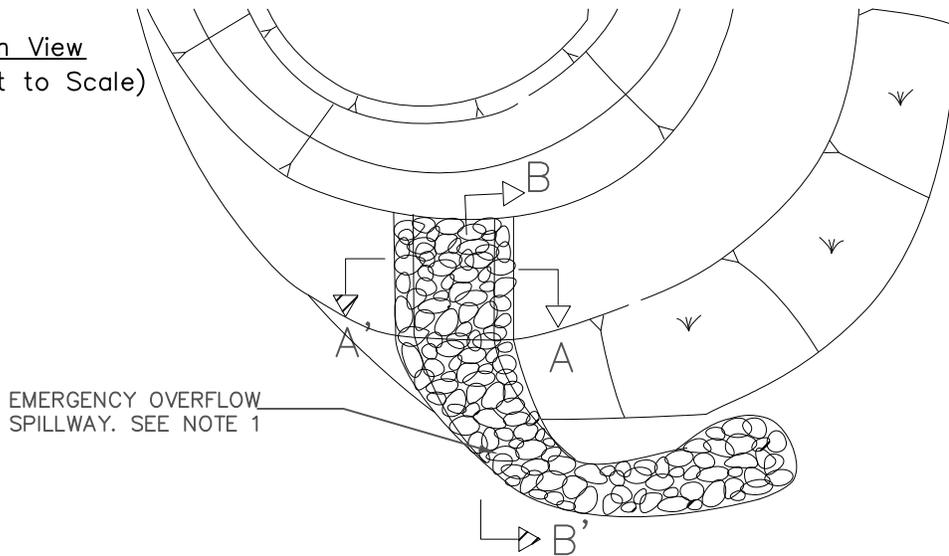
NOTES:

- ① USE A MINIMUM OF A 54" DIA TYPE 2 CATCH BASIN
- ② OUTLET CAPACITY: 100-YEAR PEAK FLOW FOR ON-LINE BASINS.
- ③ METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PREFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT.
- ④ FRAME AND LADDER OR STEPS OFFSET SO:
 - A. CLEANOUT GATE IS VISIBLE FROM TOP.
 - B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND
 - C. FRAME IS CLEAR OF CURB.
- ⑤ IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4"
- ⑥ PROVIDE AT LEAST ONE 3 X .090 GAGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL. (MAXIMUM 3' VERTICAL SPACING)
- ⑦ LOCATE ADDITIONAL LADDER RUNGS IN STRUCTURES USED AS ACCESS TO TANKS OR VAULTS TO ALLOW ACCESS WHEN CATCH BASIN IS FILLED WITH WATER

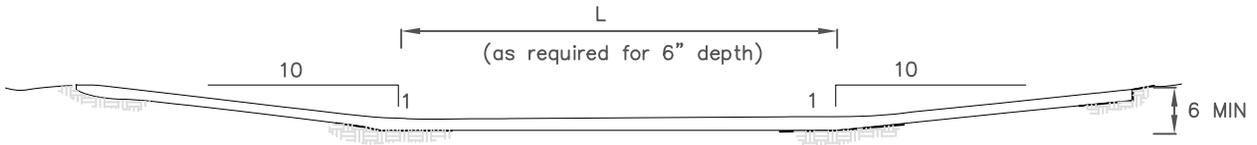
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Figure 6-17: Multiple Orifice Outlet

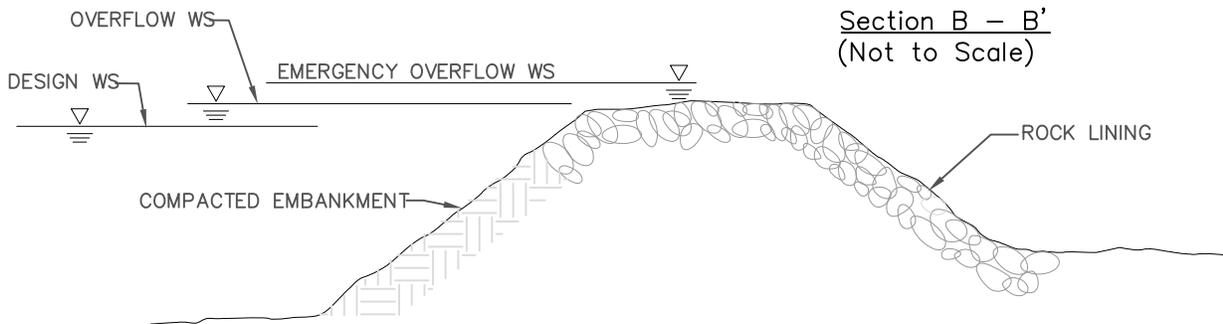
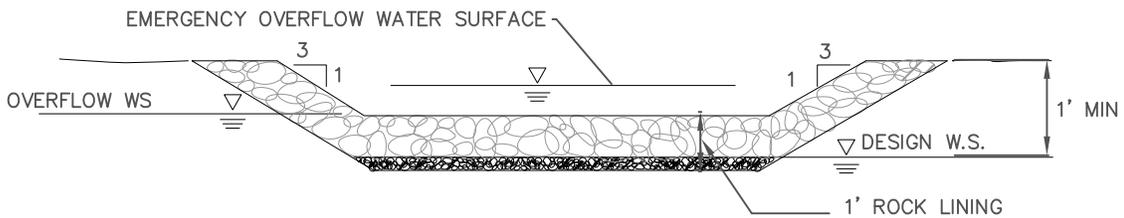
Plan View
(Not to Scale)



Section A – A' Option 1
(Not to Scale)



Section A – A' Option 2
(Not to Scale)



NOTES:

1. ALTERNATIVE SPILLWAY DESIGNS BASED ON THE CALIFORNIA DEPARTMENT OF WATER RESOURCES' GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF SMALL EMBANKMENT DAMS OR AT THE DISCRETION OF THE DEPARTMENT



Figure 6-18: Spillway

Limitations

Limitations for dry extended detention basins include:

- Surface space availability - typically 0.5 to 2.0 percent of the total tributary development area required.
- Depth to groundwater - bottom of basin should be 2 feet higher than the seasonal high water table elevation.
- Steep slopes - basins placed above slopes greater than 15 percent or within 200 feet from the top of a hazardous slope or landslide area require a geotechnical investigation.
- Compatibility with flood control - basins must not interfere with flood control functions of existing conveyance and detention structures.

Design Criteria

Dry extended detention basins should be designed according to the requirements listed in Table 6-23 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-23: Dry Extended Detention Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV
Drawdown time for SQDV	hours	Top 50%: 12 hrs (minimum); Bottom 50%: 36 hrs
Basin Design Volume	acre-ft	1.2 * SQDV
Forebay basin size	acre-feet	5 to 15% of SQDV
Maximum forebay drain time	min	45
Low-flow channel depth	inches	9
Low-flow channel flow capacity		2*forebay outlet rate
Freeboard (minimum)	inches	12
Flow path length to width ratio	L:W	2:1, larger preferred; can be achieved using internal berms
Longitudinal slope	percentage	1 (forebay) and 0-2 (main basin)
Low flow channel geometry	feet	depth of 0.5 and width of 1
Minimum outflow device diameter	inches	18

Sizing Criteria

Dry extended detention (ED) basins are basins designed such that the SQDV is detained for 48 hours. This allows sediment particles and associated pollutants to settle and be removed from the stormwater. Procedures for sizing extended detention basins are summarized below. A sizing example is also provided.

Step 1: Calculate the design volume

Dry extended detention facilities shall be sized to capture and treat the SQDV (see Section E.1).

Step 2: Calculate the volume of the active basin

The total basin volume should be increased an additional 20% above the SQDV to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the SQDV. Freeboard is in addition to the total basin volume. Calculate the volume of the active basin (V_a):

$$V_a = 1.20 * \text{SQDV} \quad (\text{Equation 6-37})$$

Step 3: Determine detention basin location and preliminary geometry based on site constraints

Based on site constraints, determine the basin geometry (area and length) and the storage available by developing an elevation-storage relationship for the basin. The cross-sectional geometry across the width of the basin should be approximately trapezoidal. Shallow side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

- 1) Calculate the width of the basin footprint (W_{tot}) as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \quad (\text{Equation 6-38})$$

Where:

A_{tot} = total surface area of the basin footprint (ft²)

L_{tot} = total length of the basin footprint (ft)

- 2) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, (L_{av-tot}):

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \quad (\text{Equation 6-39})$$

Where:

Z = interior side slope as length per unit height (H:V)

d_{fb} = freeboard depth (ft)

- 3) Calculate the width of the active volume surface area including the internal berm but excluding freeboard (ft), (W_{av-tot}):

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \quad (\text{Equation 6-40})$$

- 4) Calculate the total active volume surface area including the internal berm and excluding freeboard, (A_{av-tot}):

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \quad (\text{Equation 6-41})$$

- 5) Calculate the area of the berm, (A_{berm}):

$$A_{berm} = W_{berm} \times L_{berm} \quad (\text{Equation 6-42/43})$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm (= width excluding freeboard, W_{av-tot})

- 6) Calculate the surface area excluding the internal berm and freeboard, A_{av} :

$$A_{av} = A_{av-tot} - A_{berm} \quad (\text{Equation 6-44})$$

Step 4: Determine Dimensions of Forebay

The forebay should be sized to at least 5 to 15% of the basin active volume (V_a). Calculate the active volume of the forebay, (V_1):

$$V_1 = \frac{V_a \times \%V_1}{100} \quad (\text{Equation 6-45})$$

Where:

$\%V_1$ = percent of V_a in forebay (%)

V_a = total active volume (ft³)

- 7) Calculate the surface area for the active volume of forebay (A_1):

$$A_1 = \frac{V_1}{d_1} \quad (\text{Equation 6-46})$$

Where:

$$d_1 = \text{average depth for the forebay (ft)}$$

- 8) Calculate the length of forebay, (L_1):

$$L_1 = \frac{A_1}{W_1} \quad (\text{Equation 6-47})$$

Where:

$$W_1 = \text{width of forebay (ft)}$$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

- 1) Calculate the active volume of Cell 2, (V_2):

$$V_2 = V_a - V_1 \quad (\text{Equation 6-48})$$

Where:

$$V_a = \text{total basin active volume (ft}^3\text{)}$$

$$V_1 = \text{volume of forebay (ft}^3\text{)}$$

- 2) Calculate the surface area, A_2 , for the active volume of Cell 2:

$$A_2 = A_{av} - A_1 \quad (\text{Equation 6-49})$$

Where:

$$A_{av} = \text{basin surface area excluding berm and freeboard (ft}^2\text{)}$$

$$A_1 = \text{surface area of forebay (ft}^2\text{)}$$

- 3) Calculate the average depth (d_2) for the active volume of Cell 2:

$$d_2 = \frac{V_2}{A_2} \quad (\text{Equation 6-50})$$

- 4) Calculate the length of Cell 2, (L_2):

$$L_2 = \frac{A_2}{W_2} \quad (\text{Equation 6-51})$$

Where:

$$W_2 = \text{width of Cell 2 (ft)}$$

- 5) Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen. Calculate the length-to width (LW_{mid2}) ratio of Cell 2 at half of d_2 follows:

$$LW_{mid2} = \frac{L_{mid2}}{W_{mid2}} \quad (\text{Equation 6-52})$$

Where:

$$W_{mid2} = W_2 - Zd_2 \quad (\text{Equation 6-53})$$

$$L_{mid2} = L_2 - Zd_2 \quad (\text{Equation 6-54})$$

$$W_{mid2} = \text{width of Cell 2 at half of } d_2 \text{ (ft)}$$

$$L_{mid2} = \text{length of Cell 2 at half of } d_2 \text{ (ft)}$$

$$Z = \text{interior side slope as length per unit height (H:V)}$$

$$d_2 = \text{cell 2 average depth (ft)}$$

Step 6: Ensure Design Requirements and Site Constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 48 hours. The outlet structure should be designed to release the bottom 50% of the detention volume (half-full to empty) over 36 hours, and the top half (full to half-full) in 12 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak stormwater runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency

spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

- 1) The total basin volume should be increased an additional 20% of the SQDV to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the SQDV. Freeboard is in addition to the total basin volume.
- 2) The minimum freeboard should be at least 1 foot above the emergency overflow water surface for dry extended detention basins.
- 3) The minimum flow-path length to width ratio at half basin height should be a minimum of 3:1 (L:W) and can be achieved using internal berms or other means to prevent short-circuiting. Intent: a long flow length will improve fine sediment removal.
- 4) The cross-sectional geometry across the width of the basin should be approximately trapezoidal. Shallow side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.
- 5) All dry ED basins should be free draining and a low flow channel should be provided. A low flow channel is a narrow, shallow trench filled with pea gravel and encased with filter fabric that runs the length of the basin to drain dry weather flows. The low flow channel should be of sufficient size considering the natural characteristics of the soil and have a positive-draining gradient flowing toward the outlet structure (typically 1 ft wide by 6 inches deep). If infiltration rates of subsurface soils are insufficient, the low flow channel should tie into perforated pipe at the outlet structure. If a sand filter or planting media is provided beneath the dry ED basin for increased volume reduction, it may be designed to take the place of the low flow channel.
- 6) The basin bottom should have a 1% longitudinal slope (direction of flow) in the forebay, and may range from 0 to 2% longitudinal slope in the main basin. The bottom of the basin should slope 2% toward the center low flow channel.
- 7) A basin should be large enough to allow for equipment access via a graded ramp.

Soils Considerations

- 1) The slopes of the detention basin should be analyzed for slope stability using rapid drawdown conditions and should meet the minimum standards set by the Ventura County Flood Control District. A 1.5 static factor of safety should be used. Seismic analysis is not required due to the temporary storage of water in the basin.
- 2) The infiltration capability of the dry ED basin can be enhanced by incorporating soil amendments.

Energy Dissipation

- 1) Energy dissipation controls constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flow should be installed at the inlet to the sediment forebay. Flow velocity into the basin forebay should be controlled to 4 feet per second (ft/sec) or less.
- 2) Energy dissipation controls must also be used at the outlet/spillway from the detention basin unless the basin discharges to a storm drain or hardened channel.

Sediment Forebay

As untreated stormwater enters the dry ED basin, it passes through a sediment forebay for coarse solids removal. The forebay may be constructed using an internal berm constructed out of earthen embankment material, grouted riprap, stop logs, or other structurally sound material.

- 1) The basin should be sized so that 5 to 15% of the total basin volume is in the forebay and 85 to 95% of the total basin volume is in the main portion of the basin.
- 2) A gravity drain outlet from the forebay (2 inch minimum diameter) should extend the entire width of the internal berm and be designed to completely drain to the main basin within 10 minutes.
- 3) The forebay outlet should be offset (horizontally) from the inflow streamline to prevent short-circuiting.
- 4) Permanent steel post depth markers should be placed in the forebay to define sediment removal limits at 50% of the forebay sediment storage depth.

Vegetation

Vegetation within the dry ED basin provides erosion protection from wind and water and biofiltration of stormwater. The local permitting authority should review and approve any proposed basin landscape plan prior to implementation and following guidelines should be followed:

- 1) The bottom and slopes of the dry ED basin should be vegetated. A mix of erosion-resistant plant species that effectively bind the soil should be used on the slopes and a diverse selection of plants that thrive under the specific site, climatic, and watering conditions should be specified for the basin bottom. The basin bottom should not be planted with trees, shrubs, or other large woody plants that may interfere with sediment removal activities. The basin should be free of floating objects. Only native perennial grasses, forbs, or similar vegetation that can be replaced via seeding should be used on the basin bottom.
 - a. Landscaping outside of the basin is required for all dry ED basins and should adhere to the following criteria so as not to hinder maintenance operations:

- b. No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (*Salix babylonica*) should not be planted in or near detention basins.
- 2) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloveedia](#) located at the California Department of Food and Agriculture website- or the California Invasive Plant Council website at www.cal-ipc.org.
- 3) A plant list provided by a landscape professional should be used as a guide only and should not replace project-specific planting recommendations, including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Sand Filter or Planting Media Layer

For increasing the volume reduction capability of a dry ED basin, an appropriately sized sand filter or planting media layer can be placed beneath the dry ED basin to achieve desired volume reduction goals if soil and slope conditions allow (i.e., infiltration rate greater than 0.5 in/hr but less than 2.4 in/hr; site slope less than 15%). The drawdown time of the sand filter or planting media layer should be less than 72 hours. The base of the sand filter or planting media layer should be level (i.e., zero slope). If a sand filter/planting media layer is provided over the length of the basin, it can take the place of the low-flow channel so long as it is designed to adequately infiltrate dry weather flows. Sizing of the sand filter and planting media layer for dry ED basins is the same as for [sand filters](#) and [bioretention](#) areas, respectively. The depth of water in the dry ED basin should not exceed 6 feet.

Outlet Structure and Drawdown Time

A drawdown time of 36 to 48 hours shall be provided for the SQDV. This drawdown time is for the volume in the basin above the sand filter layer (if provided) and serves the purpose of water quality treatment. An outflow device should be designed to release the bottom 50% of the detention volume (half-full to empty) over 24 to 32 hours, and the top half (full to half-full) in 12 to 16 hours. *The intention is that the drawdown schemes that detain low flows for longer periods than high flows have the following advantages over outlets that drain the basin evenly:*

- Greater flood control capabilities
- Enhanced treatment of low flows which make up the bulk of incoming flows.

Additional storage, detention, and outlet control is required to achieve pre-development stormwater runoff discharge rates for hydromodification control. The outlet structure

can be designed to achieve flow control for meeting the multiple objectives of water quality and flow attenuation.

The outflow device (i.e., outlet pipe) should be oversized (18 inch minimum diameter). There are two options that can be used for the outlet structure:

- 1) Uniformly perforated riser structures.
- 2) Multiple orifice structures (orifice plate).

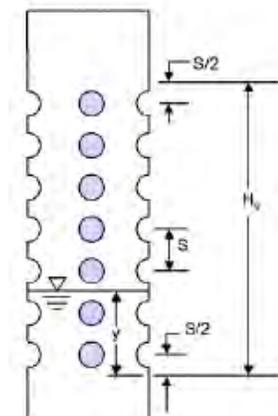
The outlet structure can be placed in the basin with a debris screen (Figure 6-15) or housed in a standard manhole (Figure 6-16). If a multiple orifice structure is used, an orifice restriction (if necessary) should be used to limit orifice outflow to the maximum discharge rates allowable for achieving the desired water quality and flow control objectives. Orifice restriction plates should be removable for emergency situations. A removable trash rack should be provided at the outlet.

Note that a primary overflow (typically a riser pipe connected to the outlet works) should be sized to pass flows larger than the stormwater quality design storm (if the ED basin is sized only for water quality) or to pass flows larger than the peak flow rate of the maximum design storm to be detained in the basin (e.g., 100-yr, 24-hr). The primary overflow is intended to protect against overtopping or breaching of a basin embankment.

Perforated Risers Outlet Sizing Methodology

The following attributes influence the perforated riser outlet sizing calculations:

- Shape of the basin (e.g., trapezoidal)
- Depth and volume of the basin
- Elevation / depth of first row of holes
- Elevation / depth of last row of holes
- Size of perforations
- Number of rows or perforations and number of perforations per row
- Desired drawdown time (e.g., 16 hour and 32 hour draw down for top half and bottom half respectively, 48 hour total drawdown time for the stormwater quality design volume)



Perforated Riser Outlet

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The governing rate of discharge from a perforated riser structure can be calculated using Equation 6-44 below:

$$Q = C_p \frac{2A_p}{3H_s} \sqrt{2g} H^{3/2} \quad (\text{Equation 6-55})$$

Where:

- Q = riser flow discharge (cfs)
- C_p = discharge coefficient for perforations (use 0.61)
- A_p = cross-sectional area of all the holes (ft²)
- s = center to center vertical spacing between perforations (ft)
- H_s = distance from $s/2$ below the lowest row of holes to $s/2$ above the top row of holes (McEnroe 1988).
- H = effective head on the orifice (measured from center of orifice to water surface)

For the iterative computations needed to size the perforations in the riser and determine the riser height, a simplified version of Equation 6-44 may be used as shown below in Equation 6-45 and Equation 6-46:

$$Q = kH^{3/2} \quad (\text{Equation 6-56})$$

Where:

- H = effective head on the orifice (measured from center of orifice to water surface)

$$k = C_p \frac{2A_p}{3H_s} \sqrt{2g} \quad (\text{Equation 6-57})$$

Where:

- C_p = discharge coefficient for perforations (use 0.61)
- A_p = cross-sectional area of all the holes (ft²)
- s = center to center vertical spacing between perforations (ft)

H_s	=	distance from $s/2$ below the lowest row of holes to $s/2$ above the top row of holes.
g	=	32.17 ft/sec ²

Uniformly perforated riser designs are defined by the depth or elevation of the first row of perforations, the length of the perforated section of pipe, and the size or diameter of each perforation.

Multiple Orifice Outlet Sizing Methodology

The following attributes influence multiple orifice outlet sizing calculations:

- Shape of the basin (e.g., trapezoidal)
- Depth and volume of the basin
- Elevation of each orifice
- Desired draw-down time (e.g., 16 hour and 32 hour draw down times for top half and bottom half respectively, 48 hour drawdown time for stormwater quality design volume)

The rate of discharge from a single orifice can be calculated using Equation 6-22.

$$Q = CA(2gH)^{0.5} \quad \text{(Equation 6-58)}$$

Where:

Q	=	orifice flow discharge
C	=	discharge coefficient
A	=	cross-sectional area of orifice or pipe (ft ²)
g	=	acceleration due to gravity (32.2 ft/s ²)
H	=	effective head on the orifice (measured from center of orifice to water surface)

Multiple orifice designs are defined by the depth (or elevation) and the size (or diameter) of each orifice. The steps needed to size a dual orifice outlet are outlined in Appendix E; multiple orifices may be provided and sized using a similar approach.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the

peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed on-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway should provide for adequate energy dissipation downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is on-line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (<http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf>). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

- 1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.
- 2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.
- 3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

- 1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass the 100-yr 24-hr post-development peak stormwater runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.
- 2) The emergency overflow spillway shall be armored to withstand the energy of the spillway flows.
- 3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

- 1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

- 2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.
- 3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.
- 4) Landscaped slopes should be no greater than 3:1 (H:V) to allow for maintenance.
- 5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer and approved by the Local permitting authority.

Embankments

- 1) Earthworks and berm embankments should be performed in accordance with the latest edition of the “Greenbook Standard Specifications for Public Works Construction”.
- 2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.
- 3) Top of berm separating forebay and main basin should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.
- 4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the Local permitting authority.
- 5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.
- 6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.
- 7) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.
- 8) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.
- 9) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

- 1) Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.
- 2) If fences are required, fences should be designed and constructed in accordance with relevant standards and should typically be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

- 1) Dry extended detention basins and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

- 1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement with the Local permitting authority is required to ensure adequate performance and allow emergency access to the facilities.
- 2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.
- 3) A ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.
- 4) All access ramps and roads should be provided in accordance with the current policies of the Ventura County Flood Control District or local approval authority.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited.

Operations and Maintenance

Maintenance is of primary importance if extended detention basins are to continue to function as originally designed. A maintenance agreement must be developed with the local approval authority to ensure adequate performance and allow emergency access. Maintenance of the basin is the responsibility of the development, unless otherwise agreed upon.

A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

- 1) The basin should be inspected semiannually or more frequently, and inspections after major storm events are encouraged (see Appendix I for guidance on facility maintenance inspections). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season (see Appendix I for dry extended detention basin inspection and maintenance checklist).
- 2) Site vegetation should be maintained as follows:
 - Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.
 - Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
 - Grass should be mowed to 4 to 9 inch high and grass clippings should be removed.
 - Fallen leaves and debris from deciduous plant foliage should be raked and removed.
 - Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the [encyclopedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
 - Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.
 - No herbicides or other chemicals should be used to control vegetation.
- 3) Sediment buildup exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations,

the sediment must be disposed of in a hazardous waste landfill. It is recommended to clean the forebay frequently to reduce frequency of main basin cleaning.

- 4) Remove sediment from basin when accumulation reaches 25% of original design depth. Cleaning is recommended to occur in early spring to allow vegetation to reestablish.
- 5) Repair erosion to banks and bottom of basin as required.
- 6) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.
- 7) Control vectors as needed.

TCM-2: Wet Detention Basin

Wet detention basins are constructed, naturalistic ponds with a permanent or seasonal pool of water (also called a “wet pool” or “dead storage”). Aquascape facilities, such as artificial lakes, are a special form of wet pool facility that can incorporate innovative design elements to allow them to function as a stormwater treatment facility in addition to an aesthetic water feature. Wetponds require base flows to exceed or match losses through evaporation and/or infiltration and they must be designed with the outlet positioned and/or operated in such a way as to maintain a permanent pool. Wetponds can be designed to provide extended detention of incoming flows using the volume above the permanent pool surface.



Wet Detention Basin

Photo Credit: Geosyntec Consultants

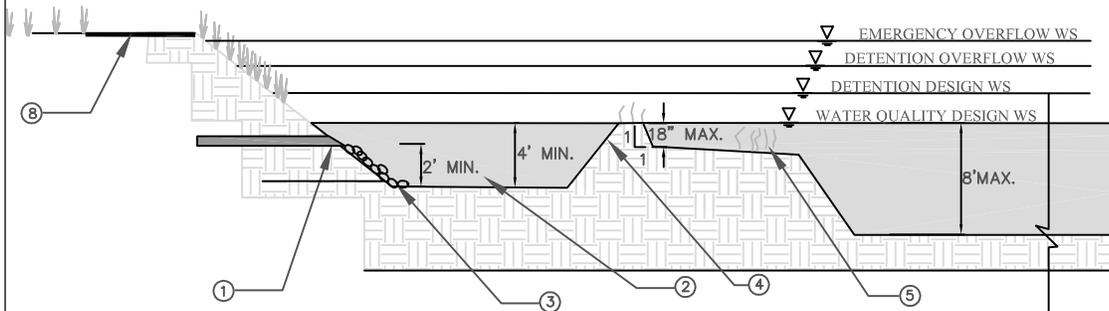
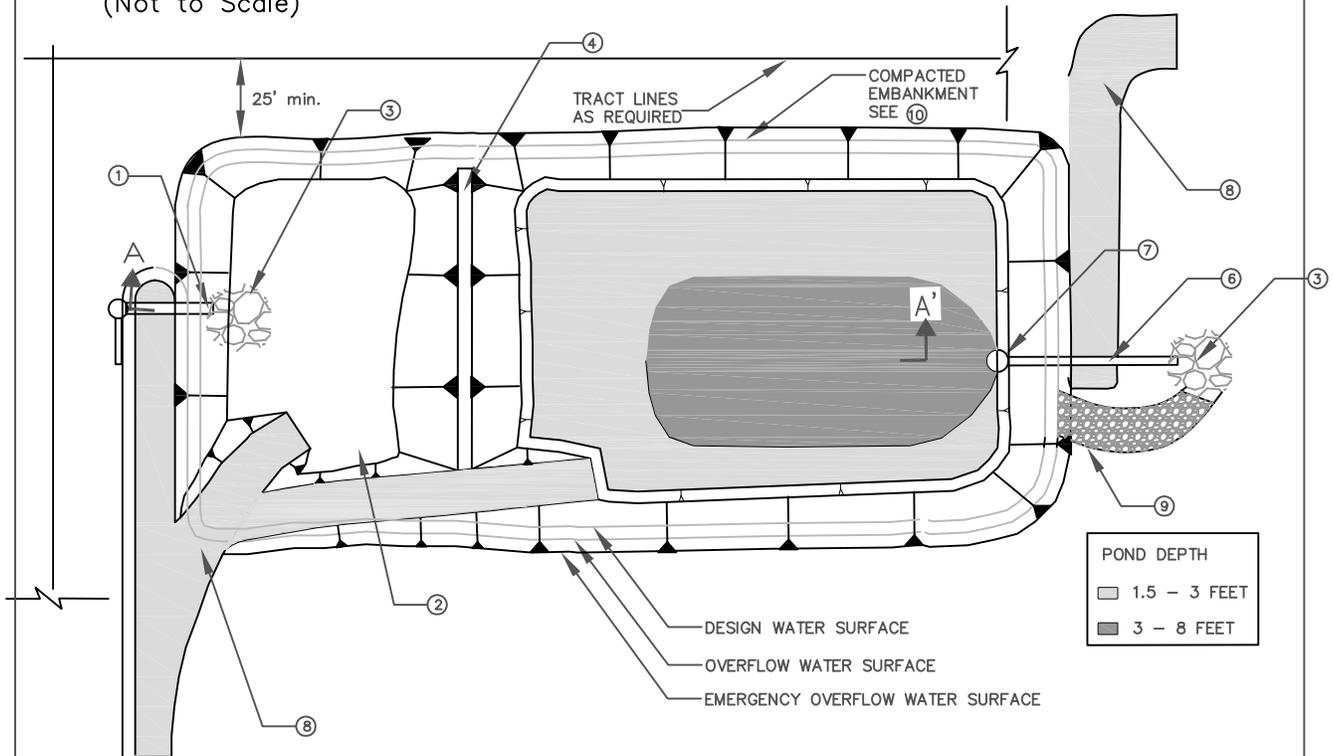
Application

- Regional detention & treatment
- Roads, highways, parking lots, commercial, residential
- Parks, open spaces, and golf courses

Preventative Maintenance

- inspected at a minimum annually and inspections after major storm events
- Pruned or remove vegetation, large shrubs, or trees that limit access or interfere with basin operation
- Remove sediment buildup at inlets and outlets

Plan View
(Not to Scale)



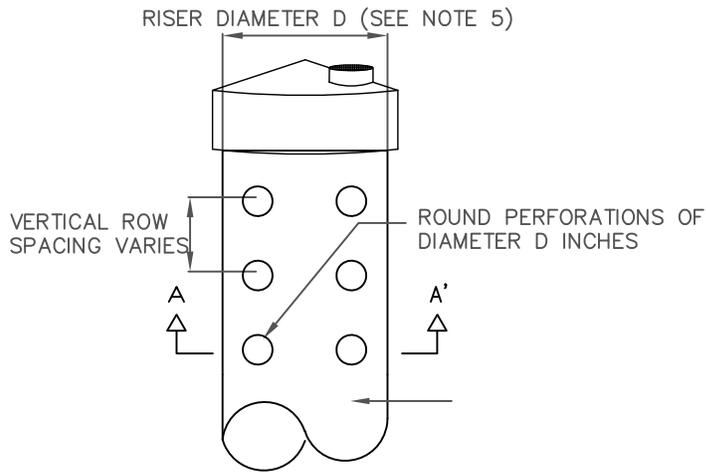
Section A - A'
(Not to Scale)

NOTES:

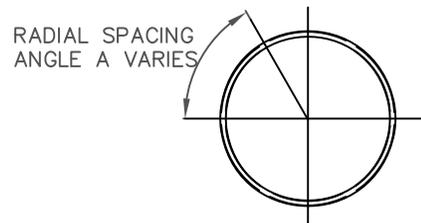
- ① INLET PIPE SHOULD BE SUBMERGED WITH A MINIMUM OF 2' DISTANCE FROM THE BOTTOM
- ② FIRST CELL VOLUME SHALL EQUAL 25% TO 35% OF TOTAL WETPOND VOLUME. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1' MIN SEDIMENT STORAGE DEPTH.
- ③ RIP RAP APRON OR OTHER ENERGY DISSIPATION.
- ④ BERM SHALL EXTEND ACROSS ENTIRE WIDTH OF THE WETPOND.
- ⑤ EMERGENT VEGETATION SHALL BE PLANTED IN REGIONS OF THE POND THAT ARE 3' DEEP OR LESS.
- ⑥ SIZE OUTLET PIPE TO PASS 100-YEAR PEAK FLOW FOR ON-LINE PONDS AND WATER QUALITY PEAK FLOW FOR OFF-LINE PONDS.
- ⑦ WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 8-2 AND FIGURE 8-3 FOR DETAILS.
- ⑧ MAINTENANCE ACCESS ROAD SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.
- ⑨ INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2-4 FOR DETAILS

Geosyntec
consultants

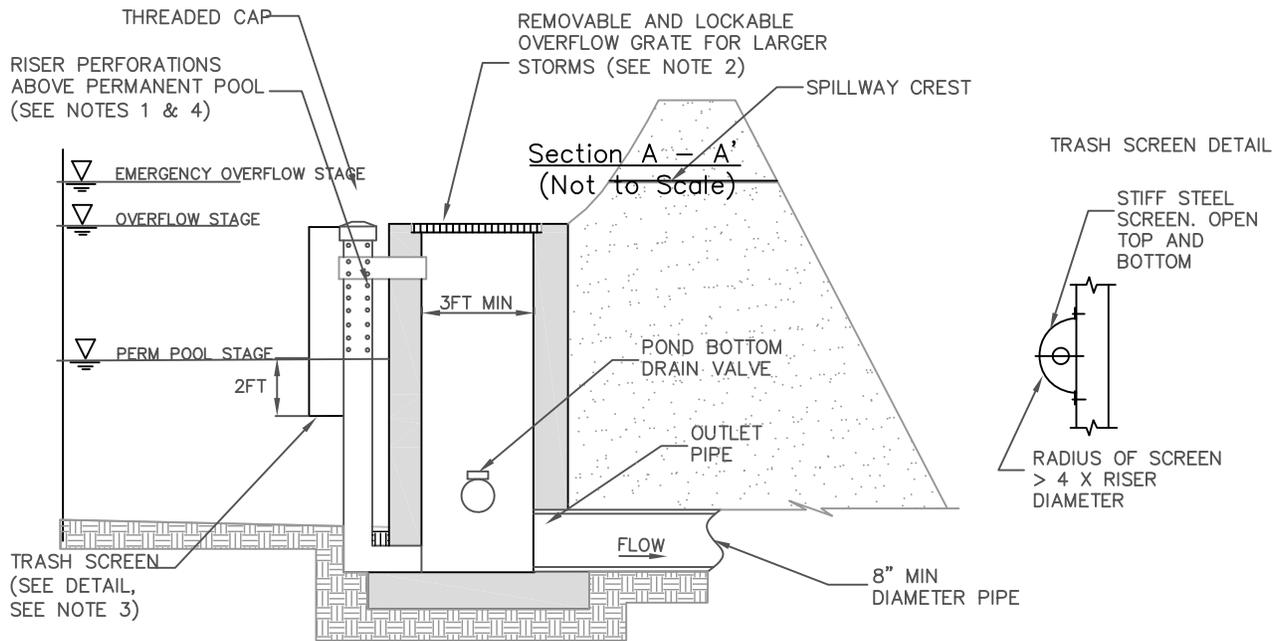
Figure 6-19: Wet Detention Basin



Perforated Riser Detail
(Not to Scale)



Section A - A'
(Not to Scale)



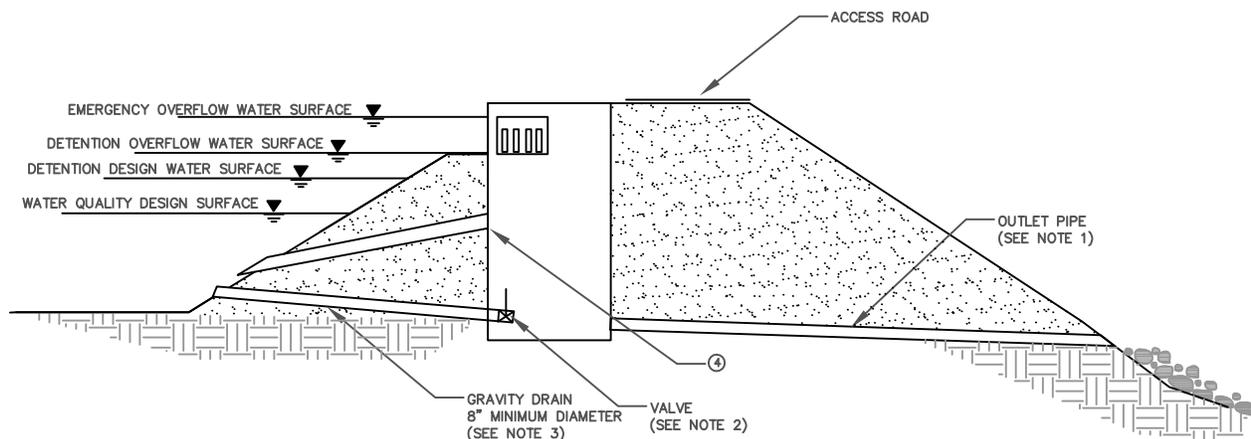
Perforated Riser Outlet Structure
(Not to Scale)

NOTES:

- ① RISER PIPE SHALL BE SIZED TO PROVIDE 36 TO 48-HOUR FULL BRIM DRAW DOWN TIME.
- ② TOTAL OUTLET CAPACITY: 100-YEAR PEAK FLOW FOR ON-LINE BASINS AND WATER QUALITY DESIGN FLOW FOR OFF-LINE BASINS.
- ③ SCREEN OPENINGS SHALL BE AT LEAST 1/4" AND SHALL NOT EXCEED THE DIAMETER OF THE PERFORATIONS ON THE RISER.
- ④ RISER PIPE PERFORATION DIAMETER SHALL BE NO LESS THAN 1/2" AND NO MORE THAN 2"
- ⑤ MINIMUM PIPE DIAMETER (D) IS 2'
- ⑥ RISER PIPE MATERIAL IS CMP



Figure 6-20: Riser Outlet



Inverted Pipe Outlet Structure
(Not to Scale)

NOTES:

- ① SIZE OUTLET PIPE SYSTEM TO PASS 100-YEAR FLOW FOR ON-LINE PONDS AND WATER QUALITY PEAK FLOW FOR OFF-LINE PONDS.
- ② VALVE MAY BE LOCATED INSIDE MANHOLE OR OUTSIDE WITH APPROVED OPERATIONAL ACCESS
- ③ INVERT OF DRAIN SHALL BE 6" MINIMUM BELOW TOP OF INTERNAL BERM. LOWER PLACEMENT IS DESIRABLE. INVERT SHALL BE 6" MINIMUM ABOVE BOTTOM OF POND.
- ④ OUTLET PIPE INVERT SHALL BE AT WETPOOL WATER SURFACE ELEVATION

	
<p>Figure 6-21: Inverted Pipe Outlet</p>	

Limitations

Limitations for wet detention basins include:

- Wet detention basins typically are used for treating areas larger than 10 acres and less than 10 square miles. They are especially applicable for regional water quality treatment and flow control.
- Off-line wet detention basins must not interfere with flood control functions of existing conveyance and detention structures.
- If wet detention basins are located in areas with site slopes greater than 15% or within 200 feet of a hazardous steep slope or mapped landslide area (on the uphill side), a geotechnical investigation and report must be provided to ensure that the basin does not compromise the stability of the site slope or surrounding slopes.
- Wet detention basins require a regular source of base flow if water levels are to be maintained. If base flow is insufficient during summer months, supplemental water may be necessary to maintain water levels.

Design Criteria

The main challenge associated with wet detention basins is maintaining desired water levels. A wet detention basin should be designed according to the requirements listed in Table 6-24 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-24: Wet Detention Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-ft	See Section 2 and Appendix E for calculating SQDV.
Permanent Pool Volume		SQDV
Forebay Volume		5 to 10% of SQDV
Maximum Forebay Drain Time	min	45
Depth without sediment storage	feet	0.5-12 (littoral zone, 25-40% permanent pool) 4 (first cell minimum) 8 (any cell maximum) Deeper zone: 4-8 feet average; 12 feet maximum depth
Maximum residence time	Days	7 (dry weather)
Freeboard (minimum)	inches	12

Flow path length to width ratio	L:W	2:1 (larger preferred)
Side slope (maximum)	H:V	4:1 (H:V) Interior and 3:1 (H:V) Exterior
Longitudinal slope	percentage	1 (forebay) and 0-2 (main basin)
Vegetation Type	--	Varies see vegetation section below
Vegetation Height	--	Varies see vegetation section below
Buffer zone (minimum)	feet	25
Minimum outflow device diameter	inches	18

Sizing Criteria

Wet Detention basins may be designed with or without extended detention above the permanent pool. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [VEG-5: Dry Extended Detention Basin](#)). If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool, the sizing is dependent of the functionality of the basin; the basin may function as water quality treatment only or water quality plus peak flow attenuation.

If the basin is designed for water quality treatment only, then the permanent pool volume should be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume, and the surcharge volume should be sized to attenuate peak flows in order to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [VEG-5: Dry Extended Detention Basin](#)).

Step 1: Calculate the design volume

Wet detention basins shall be sized with a permanent pool volume equal to the SQDV volume (see [Section 2](#) and Appendix E).

Step 2: Determine the active design volume for the wet detention basin without extended detention

The active volume of the wet detention basin, V_a , shall be equal to the SQFV plus an additional 5% for sediment accumulation.

$$V_a = 1.05 \times SQDV \quad (\text{Equation 6-59})$$

Step 3: Determine pond location and preliminary geometry based on site constraints

Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. Note that a more natural geometry may be used and is in many cases recommended; the preliminary basin geometry calculations should be used for sizing purposes only.

- 1) Calculate the width of the pond footprint, W_{tot} , as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \quad (\text{Equation 6-60})$$

Where:

A_{tot} = total surface area of the pond footprint (ft²)

L_{tot} = total length of the pond footprint (ft)

- 1) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, L_{av-tot} :

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \quad (\text{Equation 6-61})$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

- 2) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, W_{av-tot} :

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \quad (\text{Equation 6-62})$$

- 3) Calculate the total active volume surface area including the internal berm and excluding freeboard, A_{av-tot} :

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \quad (\text{Equation 6-63})$$

- 4) Calculate the area of the berm, A_{berm} :

$$A_{berm} = W_{berm} \times L_{berm} \quad (\text{Equation 6-64})$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

- 5) Calculate the active volume surface area excluding the internal berm and freeboard, A_{wq} :

$$A_{wq} = A_{wq = tot} - A_{berm} \quad (\text{Equation 6-65})$$

Step 4: Determine Dimensions of Forebay

The wet detention basin should be divided into two cells separated by a berm or baffle. The forebay should contain between 5 and 10 percent of the total volume. The berm or baffle volume should not count as part of the total volume. Calculate the active volume of forebay, V_1 :

$$V_1 = \frac{V_a \times \%V_1}{100} \quad (\text{Equation 6-66})$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

- 1) Calculate the surface area for the active volume of forebay, A_1 :

$$A_1 = \frac{V_1}{d_1} \quad (\text{Equation 6-67})$$

Where:

d_1 = average depth for the active volume of forebay (ft)

- 1) Calculate the length of forebay, L_1 . Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \quad (\text{Equation 6-68})$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av-tot} = L_{berm}$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

- 1) Calculate the active volume of Cell 2, V_2 :

$$V_2 = V_a - V_1 \quad (\text{Equation 6-69})$$

- 2) The minimum wetpool surface area includes 0.3 acres of wetpool per acre-foot of permanent wetpool volume. Calculate A_{min2} :

$$A_{min2} = (V_2 \times 0.3 \frac{\text{acres}}{\text{acre-foot}}) \quad (\text{Equation 6-70})$$

- 3) Calculate the actual wetpool surface area, A_2 :

$$A_2 = A_{av} - A_1 \quad (\text{Equation 6-71})$$

Verify that A_2 is greater than A_{min2} . If A_2 is less than A_{min2} , then modify input parameters to increase A_2 until it is greater than A_{min2} . If site constraints limit this criterion, then another site for the pond should be chosen.

- 4) Calculate the top length of Cell 2, L_2 :

$$L_2 = \frac{A_2}{W_2} \quad (\text{Equation 6-72})$$

Where:

$$W_2 = \text{width of Cell 2 (ft), } W_2 = W_1 = W_{wq\text{-tot}} = L_{\text{berm}}$$

- 5) Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \quad (\text{Equation 6-73})$$

- 6) Calculate the emergent vegetation surface area, A_{ev} :

$$A_{ev} = \frac{A_2 \bullet \% A_{ev}}{100} \quad (\text{Equation 6-74})$$

Where:

$$\%A_{ev} = \text{percent of surface area that will be planted with emergent vegetation}$$

- 7) Calculate the volume of the emergent vegetation shallow zone (1.5 – 3 ft), V_{ev} :

$$V_{ev} = A_{ev} \bullet d_{ev} \quad (\text{Equation 6-75})$$

Where:

$$d_{ev} = \text{average depth of the emergent vegetation shallow zone (1.5 – 3 ft)}$$

8) Calculate the length of the emergent vegetation shallow zone, L_{ev} :

$$L_{ev} = \frac{A_{ev}}{W_{ev}} \quad (\text{Equation 6-76})$$

Where:

$$W_{ev} = \text{width of the emergent vegetation shallow zone (ft), } W_{ev} = W_2$$

9) Calculate the volume of the deep zone, V_{deep} :

$$V_{deep} = V_2 - V_{ev} \quad (\text{Equation 6-77})$$

10) Calculate the surface area of the deep (>3 ft) zone, A_{deep} :

$$A_{deep} = A_2 - A_{ev} \quad (\text{Equation 6-78})$$

11) Calculate the average depth of the deep zone (4-8 ft), d_{deep} :

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \quad (\text{Equation 6-79})$$

12) Calculate length of the deep zone, L_{deep} :

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \quad (\text{Equation 6-80})$$

Where:

$$W_{deep} = \text{width of the deep zone (ft), } W_{deep} = W_2$$

Step 6: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

For extended detention wet detention basin, outlet structures should be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

The basin outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

- 1) If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment only, then the permanent pool volume should be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see TCM-1: Dry Extended Detention Basin).
- 2) The wet detention basin should be divided into two cells separated by a berm or baffle. The first cell should contain between 25 to 35 percent of the total volume. The berm or baffle volume should not count as part of the total volume. Intent: The full-length berm or baffle reduces short-circuiting and promotes plug flow.
- 3) Wet detention basins with wetpool volumes less than or equal to 4,000 cubic feet may be single-celled (i.e., no baffle or berm is required).
- 4) Sediment storage should be provided in the first cell. The sediment storage should have a minimum depth of 1 foot. This volume should not be included as part of the required water quality volume.
- 5) The minimum depth of the first cell should be 4 feet, exclusive of sediment storage requirements. The depth of the first cell may be greater than the depth of the second cell. Average depth should be between 4 feet and 8 feet.
- 6) For wet detention basin depths in excess of 6 feet, some form of recirculation should be provided, such as a fountain or aerator, to prevent stratification, stagnation and low dissolved oxygen conditions.

- 7) The edge of the basin should slope from the surface of the permanent pool to a depth of 12 to 18 inches at a slope of 1:1 or greater. If soil conditions will not support a 1:1 (H:V) slope then the steepest slope that can be supported should be used or a shallow retaining wall constructed (18 inch max). Beyond the edge of the basin, a bench sloped at 4:1 (H:V) maximum should extend into the basin to a depth of at least 3 feet. A steeper slope may be used beyond the 3 foot depth to a maximum of 8 feet. Intent: steep slopes at water's edge will minimize very shallow areas that can support mosquitoes.
- 8) At least 25% of the basin area should be deeper than 3 feet to prevent the growth of emergent vegetation across the entire basin. If greater than 50% of the wet pool area is in excess of 6 feet deep, some form of recirculation should be provided, such as a fountain or aerator, to prevent stratification, stagnation and low dissolved oxygen conditions.
- 9) A wet detention basin should have a surface area of not less than 0.3 acres for each acre-foot of permanent pool volume. In addition, extra area needed to provide a design that meets all other provisions of this section should be provided. Additional surface area in excess of the minimum may be provided. There is no maximum surface area provided that all provisions of this section are met.
- 10) Inlets and outlets should be placed to maximize the flowpath through the facility. The flowpath length-to-width ratio should be a minimum of 1.5:1, but a flowpath length-to-width ratio of 2:1 or greater is preferred. The flowpath length is defined as the distance from the inlet to the outlet, as measured at mid-depth. The width at mid-depth can be found as follows: $\text{width} = (\text{average top width} + \text{average bottom width})/2$. Intent: a long flowpath length will improve fine sediment removal.
- 11) All inlets should enter the first cell. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.
- 12) The minimum freeboard should be 1 foot above the maximum water surface elevation (2 feet preferred) for on-line basins and 1 foot above the maximum water surface elevation for on-line basins.
- 13) The maximum residence time for dry weather flows should be 7 days. Intent: Vector control.

Internal Berms and Baffles

- 1) A berm or baffle should extend across the full width of the wet detention basin and be keyed into the basin side slopes. If the berm embankments are greater than 4 feet in height, the berm should be constructed by excavating a key equal to 50% of the embankment cross-sectional height and width. This requirement may be waived if recommended by a licensed civil engineer for the specific site conditions. The geotechnical investigation must consider the situation in which one of the two cells is empty while the other remains full of water.

- 2) The top of the berm should extend to the permanent pool surface or be one foot below the permanent pool surface to discourage public access. If the top of the berm is at the water permanent pool surface, the side slopes should be 4H:1V. Berm side slopes may be steeper (up to 3:1) if the berm is submerged one foot.
- 3) If good vegetation cover is not established on the berm, erosion control measures should be used to prevent erosion of the berm back-slope when the basin is initially filled.
- 4) The interior berm or baffle may be a retaining wall provided that the design is prepared and stamped by a licensed civil engineer. If a baffle or retaining wall is used, it should be submerged one foot below the permanent pool surface to discourage access by pedestrians.
- 5) Internal earthen berms 6 feet high or less should have a minimum top width 6 feet or as recommended by a civil engineer.

Water Supply

- 1) Water balance calculations should be provided to demonstrate that adequate water supply will be present to maintain a pool of water during a drought year when precipitation is 50% of average for the site. Water balance calculations should include evapotranspiration, infiltration, precipitation, spillway discharge, and dry weather flow (where appropriate).
- 2) Where water balance indicates that losses will exceed inputs, a source of water should be provided to maintain the basin water surface elevation throughout the year. The water supply should be of sufficient quantity and quality to not have an adverse impact on the wet detention basin water quality. Water that meets drinking water standards should be assumed to be of sufficient quality.
- 3) Wet detention basin may be designed as seasonal ponds where the water balance and water supply conditions make it infeasible to sustain a permanent wet detention basin.

Soils Considerations

Wet detention basin implementation in areas with high permeability soils requires liners to increase the chances of maintaining a permanent pool in the basin. Liners can be either synthetic materials or imported lower permeability soils (i.e., clays). The water balance assessment should determine whether a liner is required.

If low permeability soils are used for the liner, a minimum of 18 inches of native soil amended with good topsoil or compost (one part compost mixed with 3 parts native soil) should be placed over the liner. If a synthetic material is used, a soil depth of 2 feet is recommended to prevent damage to the liner during planting.

Buffer Zone

A minimum of 25 feet buffer should be provided around the top perimeter of the wet detention basin. The portion of the access road outside of the maximum water level may be included as part of the buffer.

Stormwater Quality Design Features

- 1) Wet detention basins that are located in publicly-accessible or highly visible locations should include design features that will improve and maintain the quality of water within the BMP at a level suitable for the proposed location and uses of the surrounding area. Typical design features include aeration, pumped circulation, filters, biofilters, and other facilities that operate year-round to remove pollutants and nutrients. Stormwater quality design features will result in higher quality water in the BMP and lower discharges of pollutants downstream.
- 2) Wet detention basins in publicly-accessible or highly visible locations should have a maintenance plan that includes regular collection and removal of trash from the area within and surrounding the BMP.
- 3) If fencing is required for wet detention basins in publicly-accessible or highly visible locations, the fence can be designed to be aesthetically incorporated into the site and Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section below.

Energy Dissipation

- 1) The inlet to the wet detention basin should be submerged with the inlet pipe invert a minimum of two feet from the basin bottom (not including sediment storage). The top of the inlet pipe should be submerged at least 1 foot, if possible. Intent: The inlet is submerged to dissipate energy of the incoming flow. The distance from the bottom is set to minimize resuspension of settled sediments. Alternative inlet designs that accomplish these objectives are acceptable.
- 2) Energy dissipation controls should also be used at the outlet from the wet detention basin unless the basin discharges to a stormwater conveyance system or hardened channel.

Vegetation

A plan should be prepared that indicates how aquatic, temporarily submerged areas (extended detention wet detention basins) and terrestrial areas will be stabilized with vegetation.

- 1) If the second cell of the wet detention basin is 3 feet or shallower, the bottom area should be planted with emergent wetland vegetation.

- 2) Emergent aquatic vegetation should be planted to cover 25-75% of the area of the permanent pool.
- 3) Outside of the basin, native vegetation adapted for site conditions should be used in non-irrigated sites.
- 4) The area surrounding a wet detention basin should be landscaped to minimize erosion and should adhere to the following criteria so as not to hinder maintenance operations:
 - 5) No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (*Salix babylonica*) should not be planted in or near detention basins.
- 6) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website- or the California Invasive Plant Council website at www.cal-ipc.org.
- 7) A landscape professional should provide recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Outlet Structure

- 1) An outlet pipe and outlet structure should be provided. The outlet pipe may be a perforated standpipe strapped to a manhole or placed in an embankment, suitable for extended detention, or may be back-sloped to a catch basin with a grated opening (jail house window) or manhole with a cone grate (birdcage). The grate or birdcage openings provide an overflow route should the basin outlet pipe become clogged.
- 2) For extended detention wet detention basin, outlet structures should be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.
- 3) The basin outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed off-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway provide for adequate energy dissipation

downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is -line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (<http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf>). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

- 1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.
- 2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.
- 3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

- 1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass flows greater than the basin design volume (e.g., stormwater quality design volume) directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, in addition to the spillway should be provided. See Appendix E for basin/pond outlet sizing worksheets.
- 2) The emergency overflow spillway should be armored to withstand the energy of the spillway flows. The spillway should be constructed of grouted rip-rap.
- 3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

- 1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.
- 2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

- 3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.
- 4) Landscaped slopes should be no steeper than 3:1 (H:V) to allow for maintenance.
- 5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer.

Embankments

- 1) Earthworks and berm embankments should be performed in accordance with the latest edition of the “Greenbook Standard Specifications for Public Works Construction”.
- 2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.
- 3) Top of berm should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.
- 4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the Local permitting authority.
- 5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.
- 6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.
- 7) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.
- 8) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.
- 9) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

- 1) If fences are required, fences should be designed and constructed in accordance with current and relevant policies and typically are required to be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

- 2) Wet detention basins and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

- 1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement is required to ensure adequate performance and allow emergency access to the facilities.
- 2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.
- 3) A ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.
- 4) All access ramps and roads should be provided in accordance with the current policies of the Flood Control District.

Vector Control

- 1) A Mosquito Management Plan or Service Contract should be approved or waived by the local Vector Control District for any facility that maintains a pool of water for 72 hours or more.

Operations and Maintenance

General Requirements

Maintenance is of primary importance if extended detention basins are to continue to function as originally designed. A maintenance agreement must be developed with the Flood Control District to ensure adequate performance and allow the County emergency access. Maintenance of the basin is the responsibility of the development, unless otherwise agreed upon.

A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

- 1) The basin should be inspected annually and inspections after major storm events are encouraged (see Appendix I for guidance on facility maintenance inspections). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season (see Appendix I for dry extended detention basin inspection and maintenance checklist).
- 2) Site vegetation should be maintained as follows:
- 3) Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.
- 4) Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
- 5) Grass should be mowed to 4"-9" high and grass clippings should be removed.
- 6) Fallen leaves and debris from deciduous plant foliage should be raked and removed.
- 7) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
- 8) Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.
- 9) No herbicides or other chemicals should be used to control vegetation.
- 10) Sediment buildup exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill.

- 11) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited. The use of galvanized fencing is permitted if in accordance with the Fencing requirement above.

TCM-3: Constructed Wetland

A constructed treatment wetland is a system consisting of a sediment forebay and one or more permanent micro-pools with aquatic vegetation covering a significant portion of the basin. Constructed treatment wetlands typically include components such as an inlet with energy dissipation, a sediment forebay for settling out coarse solids and to facilitate maintenance, a base with shallow sections (1 to 2 feet deep) planted with emergent vegetation, deeper areas or micro pools (3 to 5 feet deep), and a water quality outlet structure. The interactions between the incoming stormwater runoff, aquatic vegetation, wetland soils, and the associated physical, chemical, and biological unit processes are a fundamental part of constructed treatment wetlands.



Constructed Wetlands

Photo Credits: Geosyntec Consultants

Application

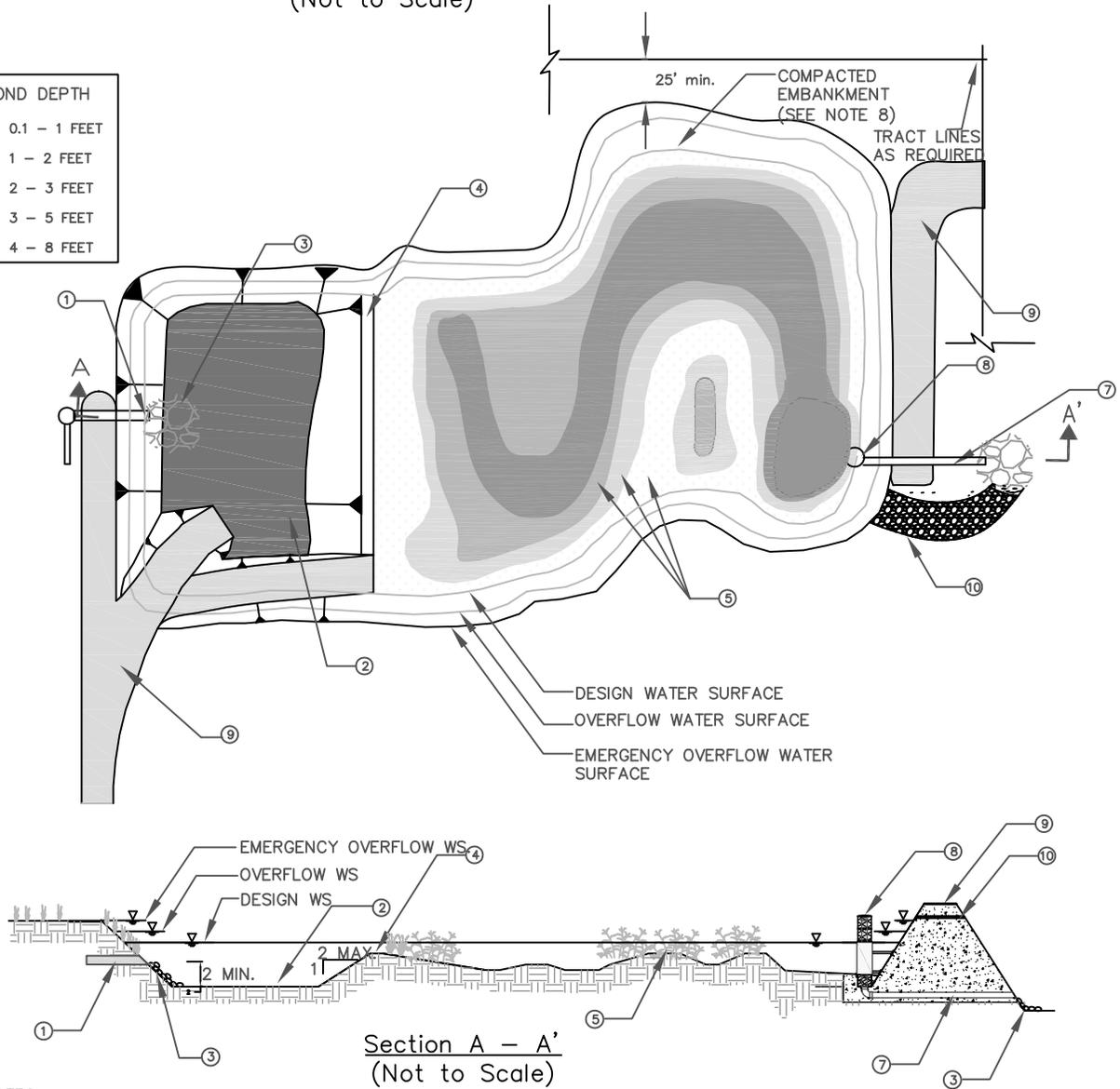
- Regional detention & treatment
- Roads, highways, parking lots, commercial, residential
- Parks, open spaces, and golf courses

Preventative Maintenance

- inspected at a minimum annually and inspections after major storm events
- Pruned or remove vegetation, large shrubs, or trees that limit access or interfere with basin operation
- Remove sediment buildup at inlets and outlets

Plan View
(Not to Scale)

POND DEPTH	
	0.1 – 1 FEET
	1 – 2 FEET
	2 – 3 FEET
	3 – 5 FEET
	4 – 8 FEET



NOTES:

- ① INLET PIPE SHOULD BE SUBMERGED WITH A MINIMUM OF 2' DISTANCE FROM THE BOTTOM
- ② SEDIMENT FOREBAY. FORE BAY VOLUME SHALL EQUAL 10% TO 20% OF TOTAL WETLAND VOLUME. FORE BAY DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1' MIN SEDIMENT STORAGE DEPTH.
- ③ RIP RAP APRON OR OTHER INLET ENERGY DISSIPATION.
- ④ BERM AT DESIGN WATER SURFACE ELEVATION OR SUBMERGED 1' BELOW DESIGN WATER SURFACE ELEVATION. EXTEND BERM ACROSS ENTIRE WIDTH OF THE WETLAND.
- ⑤ WETLAND VEGETATION. PLANTING SCHEME MUST BE DESIGNED BY A WETLAND ECOLOGIST.
- ⑥ EMBANKMENT SIDE SLOPES SHALL BE NO STEEPER THAN 2H:1V OUTSIDE AND 3H:1V INSIDE
- ⑦ SIZE OUTLET PIPE TO PASS 100-YEAR PEAK FLOW FOR ONLINE AND WATER QUALITY PEAK FLOW FOR OFFLINE BASINS.
- ⑧ WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7-2 AND FIGURE 7-3 FOR DETAILS.
- ⑨ MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FOREBAY AND MAIN BASIN.
- ⑩ INSTALL EMERGENCY OVERFLOW SPILWAY AS NEEDED. SEE FIGURE 2-4 FOR DETAILS



Figure 6-22: Constructed Wetland

Limitations

- In theory, there are no limitations on the tributary area size draining to a constructed treatment wetland; however, constructed treatment wetlands usually require considerable land area. Typically, treatment wetlands capture runoff from tributary areas larger than 10 acres and less than 10 square miles. Smaller “pocket” wetlands can be feasible in areas where space is restricted.
- If the constructed treatment wetland is not used for flow control, the wetland must not interfere with flood control functions of existing conveyance and detention structures.
- Constructed treatment wetlands should not be permitted in areas with site slopes greater than 7% or within 200 feet (on the uphill side) of a steep slope hazard area or a mapped landslide area unless a geotechnical investigation and report is completed by a licensed civil engineer.
- Constructed treatment wetlands require a regular source of water (base flow) to maintain wetland vegetation and associated treatment processes. If adequate base flow is not available year-round, supplemental water may be needed during the summer months to maintain adequate base flow.

Design Criteria

The main challenge associated with constructed treatment wetlands is maintaining base flow to support vegetation. Constructed wetlands should be designed according to the requirements listed in Table 6-25 and outlined in the section below. Constructed wetland BMP sizing worksheets are presented in Appendix E.

Table 6-25: Constructed Wetland Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Permanent pool volume	%	75% of SQDV
Drawdown time for extended detention (over permanent pool)	hours	48 ; 12 for 50% SQDV (minimum)
Sediment forebay volume	%	30 to 50% of permanent pool surface area
Depth of sediment forebay	feet	2-4 (1 foot of sediment storage required)
Wetland zone volume	%	50-70% of permanent pool surface area
Depth of wetland basin	feet	0.5 to 1.0 (30 to 50% should be 0.5 feet deep)

Design Parameter	Unit	Design Criteria
Wetland (littoral zone) bottom slope	%	10 maximum
Maximum residence time	Days	7 (dry weather)
Freeboard (minimum)	inches	12
Flow path length to width ratio	L:W	2:1, larger preferred
Side slope (maximum)	H:V	4:1 Interior; 3:1 Exterior
Vegetation Type	--	Varies see vegetation section below
Vegetation Height	--	Varies see vegetation section below
Buffer zone (minimum)	feet	25
Minimum outflow device diameter	inches	18

Sizing

In most cases, the constructed treatment wetland permanent pool should be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume should be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [VEG-5: Dry Extended Detention Basin](#)).

Step 1: Calculate the design volume

Constructed wetlands shall be sized to be greater than or equal to the SQDV volume (see [Section 2](#) and Appendix E).

Step 2: Determine the Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints

Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. The equations provided

below assume a trapezoidal geometry for cell 1 (Forebay) and cell 2, and assumes that the wetland does not have extended detention.

- 1) Calculate the width of the wetland footprint, W_{tot} , as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \quad (\text{Equation 6-81})$$

Where:

A_{tot} = total surface area of the wetland footprint (ft²)

L_{tot} = total length of the wetland footprint (ft)

- 2) Calculate the length of the water quality volume surface area including the internal berm but excluding the freeboard, L_{wq-tot} :

$$L_{wq-tot} = L_{tot} - 2Zd_{fb} \quad (\text{Equation 6-82})$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

- 3) Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, W_{wq-tot} :

$$W_{wq-tot} = W_{tot} - 2Zd_{fb} \quad (\text{Equation 6-83})$$

- 4) Calculate the total water quality volume surface area including the internal berm and excluding freeboard, A_{wq-tot} :

$$A_{wq-tot} = L_{wq-tot} \times W_{wq-tot} \quad (\text{Equation 6-84})$$

- 5) Calculate the area of the berm, A_{berm} :

$$A_{berm} = W_{berm} \times L_{berm} \quad (\text{Equation 6-85})$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

- 6) Calculate the water quality surface area excluding the internal berm and freeboard, A_{wq} :

$$A_{wq} = A_{wq = tot} - A_{berm} \quad (\text{Equation 6-86})$$

Step 3: Determine Dimensions of Forebay

30-50% of the SQDV is required to be within the active volume of forebay.

- 1) Calculate the active volume of forebay, V_1 :

$$V_1 = \frac{SQDV \times \%V_1}{100} \quad (\text{Equation 6-87})$$

Where:

$$\%V_1 = \text{percent of SQDV in forebay (\%)}$$

- 2) Calculate the surface area for the active volume of forebay, A_1 :

$$A_1 = \frac{V_1}{d_1} \quad (\text{Equation 6-88})$$

Where:

$$d_1 = \text{average depth for the active volume of forebay (2 -4 ft)} \\ (\text{ft})$$

- 3) Calculate the length of forebay, L_1 . Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \quad (\text{Equation 6-89})$$

Where:

$$W_1 = \text{width of forebay (ft), } W_1 = W_{av-tot} = L_{berm}$$

Step 4: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

- 1) Calculate the active volume of Cell 2, V_2 :

$$V_2 = SQDV - V_1 \quad (\text{Equation 6-90})$$

- 2) Calculate the surface area of Cell 2, A_2 :

$$A_2 = A_{wq} - A_1 \quad (\text{Equation 6-91})$$

- 3) Calculate the top length of Cell 2, L_2 :

$$L_2 = \frac{A_2}{W_2} \quad (\text{Equation 6-92})$$

Where:

$$W_2 = \text{width of Cell 2 (ft), } W_2 = W_1 = W_{\text{wq-tot}} = L_{\text{berm}}$$

- 4) Verify that the length-to-width ratio of Cell 2, LW_2 , is at least 3:1 with $\geq 4:1$ preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \quad (\text{Equation 6-93})$$

- 5) Calculate the very shallow zone surface area, A_{vs} :

$$A_{vs} = \frac{A_2 \cdot \% A_{vs}}{100} \quad (\text{Equation 6-94})$$

Where:

$$\%A_{vs} = \text{percent of surface area of very shallow zone}$$

- 6) Calculate the volume of the shallow zone, V_{vs} :

$$V_{vs} = A_{vs} \cdot d_{vs} \quad (\text{Equation 6-95})$$

Where:

$$d_{vs} = \text{average depth of the very shallow zone (0.1 - 1 ft)}$$

- 7) Calculate the length of the very shallow zone, L_{vs} :

$$L_{vs} = \frac{A_{vs}}{W_{vs}} \quad (\text{Equation 6-96})$$

Where:

$$W_{vs} = \text{width of the very shallow zone (ft), } W_{vs} = W_2$$

- 8) Calculate the surface area of the shallow zone, A_s :

$$A_s = \frac{A_2 \cdot \% A_s}{100} \quad (\text{Equation 6-97})$$

Where:

$\%A_s$ = percent of surface area of shallow zone

9) Calculate the volume of the shallow zone, V_s :

$$V_s = A_s \cdot d_s \quad (\text{Equation 6-98})$$

Where:

d_s = average depth of shallow zone (1 - 3 ft)

10) Calculate length of the shallow zone, L_s :

$$L_s = \frac{A_s}{W_s} \quad (\text{Equation 6-99})$$

Where:

W_s = width of the shallow zone (ft), $W_s = W_2$

11) Calculate the surface area of the deep zone, A_{deep} :

$$A_{deep} = A_2 - A_{vs} - A_s \quad (\text{Equation 6-100})$$

12) Calculate the volume of the deep zone, V_{deep} :

$$V_{deep} = V_2 - V_{vs} - V_s \quad (\text{Equation 6-101})$$

13) Calculate the average depth of the deep zone (3-5 ft), d_{deep} :

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \quad (\text{Equation 6-102})$$

14) Calculate length of the deep zone, L_{deep} :

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \quad (\text{Equation 6-103})$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 5: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 6: Size Outlet Structure

For wetlands with detention, the outlet structures should be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

In most cases, the constructed treatment wetland permanent pool should be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume should be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. A constructed treatment wetland design worksheets are presented in Appendix E. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [TCM-1: Dry Extended Detention Basin](#)).

- 1) Constructed treatment wetlands should consist of at least two cells including a sediment forebay and a wetland basin.
- 2) The sediment forebay must contain between 10 and 20 percent of the total basin volume.
- 3) The depth of the sediment forebay should be between 4 and 8 feet.
- 4) One foot of sediment storage should be provided in the sediment forebay.

- 5) The “berm” separating the two basins should be uniform in cross-section and shaped such that its downstream side gradually slopes to the main wetland basin.
- 6) The top of berm should be either at the stormwater quality design water surface or submerged 1 foot below the stormwater quality design water surface, as with wet retention basins. Correspondingly, the side slopes of the berm should meet the following criteria:
 - a. If the type of the berm is at the stormwater quality design water surface, the berm side slopes should be no steeper than 4H:1V.
 - b. If the top of berm is submerged 1 foot, the upstream side slope may be a max of 3H:1V.
- 7) The constructed treatment wetlands should be designed with a “naturalistic” shape and a range of depths intermixed throughout the wetland basin to a maximum of 5 feet.

Depth Range (feet)	Percent by Area
0.1 to 1	15
1 to 3	55
3 to 5	30

- 8) The flowpath length-to-width ratio should be a minimum of 2:1, but preferably at least 4:1 or greater. *Intent: a high flow path length to width ratio will maximize fine sediment removal.*
- 9) The minimum freeboard should be 1 foot above the maximum water surface elevation for on-line basins (2 feet preferable) and 1 foot above the maximum water surface elevation for on-line basins.
- 10) Wetland pools should be designed such that the residence time for dry weather flows is no greater than 7 days. *Intent: Minimize vector and stagnation issues.*

Water Supply

Water balance calculations should be provided to demonstrate that adequate water supply will be present to maintain a permanent pool of water during a drought year when precipitation is 50% of average for the site. Water balance calculations should include evapotranspiration, infiltration, precipitation, spillway discharge, and dry weather flow (where appropriate).

Where water balance indicates that losses will exceed inputs, a source of water should be provided to maintain the wetland water surface elevation throughout the year. The water supply should be of sufficient quantity and quality to not have an adverse impact on the

wetland water quality. Water that meets drinking water standards should be assumed to be of sufficient quality.

Soils Considerations

- 1) Implementation of constructed treatment wetlands in areas with high permeability soils (>0.1 in/hr) requires liners to increase the chances of maintaining permanent pools and/or micro-pools in the basin. Liners can be either synthetic materials or imported lower permeability soils (i.e., clays). The water balance assessment should determine whether a liner is required. The following conditions can be used as a guideline.
- 2) The wetland basin should retain water for at least 10 months of the year.
- 3) The sediment forebay should retain at least 3 feet of water year-round.
- 4) Many wetland plants can adapt to periods of summer drought, so a limited drought period is allowed in the wetland basin. This may allow for a soil liner rather than a geosynthetic liner. The sediment forebay should retain water year-round for presettling to be effective.
- 5) If low permeability soils are used for the liner, a minimum of 18 inches of native soil amended with good topsoil or compost (one part compost mixed with 3 parts native soil) should be placed over the liner (see soil amendment Section 5.10). If a synthetic material is used, a soil depth of 2 feet is recommended to prevent damage to the liner during planting.

Buffer Zone

A minimum of 25 feet buffer should be provided around the top perimeter of the constructed treatment wetlands.

Energy Dissipation

- 1) The inlet to the constructed treatment wetland should be submerged with the inlet pipe invert a minimum of two feet from the cell bottom (not including sediment storage). The top of the inlet pipe should be submerged at least 1 foot, if possible. *Intent: the inlet is submerged to dissipate energy of the incoming flow. The distance from the bottom is set to minimize resuspension of settled sediments. Alternative inlet designs that accomplish these objectives are acceptable.*
- 2) Energy dissipation controls must also be used at the outlet/spillway from the constructed treatment wetlands unless the wetland discharges to a stormwater conveyance system or hardened channel.

Vegetation

- 1) The wetland cell(s) should be planted with emergent wetland plants following the recommendations of a wetlands specialist.
- 2) Landscaping outside of the basin is required for all constructed wetlands and should adhere to the following criteria so as not to hinder maintenance operations:
 - a. No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (*Salix babylonica*) should not be planted in or near detention basins.
 - b. Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the [encycloweedia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
- 3) Project-specific planting recommendations should be provided by a wetland ecologist or a qualified landscape professional including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Outlet Structure

An outlet pipe and outlet structure should be provided. The outlet pipe may be a perforated standpipe strapped to a manhole or placed in an embankment, suitable for extended detention, or may be back-sloped to a catch basin with a grated opening (jail house window) or manhole with a cone grate (birdcage). The grate or birdcage openings provide an overflow route should the basin outlet pipe become clogged. The outlet should be protected from clogging by a skimmer shield that starts at the bottom of the permanent pool and extends above the SQDV depth. A trash rack is also required.

For wetlands with detention, the outlet structures should be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

See the dry extended detention section (see [ST-1: Dry Extended Detention Basin](#)) and Appendix E for further detail on outlet sizing.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed on-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway provide for adequate energy dissipation downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is on-line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (<http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf>). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

- 1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.
- 2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.
- 3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

- 1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass the 100-yr 24-hr post-development peak stormwater runoff discharge rate (see Appendix E for further detail) directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, *in addition* to the spillway should be provided.
- 2) The emergency overflow spillway should be armored to withstand the energy of the spillway flows. The spillway should be constructed of grouted rip-rap.
- 3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

- 1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.
- 2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.
- 3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.
- 4) Landscaped slopes should be no steeper than 3:1 (H:V) to allow for maintenance.
- 5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer and approved by the local permitting authority.

Embankments

- 1) Earthworks and berm embankments should be performed in accordance with the latest edition of the “Greenbook Standard Specifications for Public Works Construction”.
- 2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.
- 3) Top of berm should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.
- 4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the local permitting authority.
- 5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.
- 6) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.
- 7) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

- 8) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

- 1) Provide fencing in accordance with the local permitting agency's requirements. Perimeter fencing (minimum height of 42 inches) should be required on all basins exceeding two feet in depth or where interior side slopes are steeper than 6:1 (H:V).
- 2) If fences are required, fences should be designed and constructed in accordance with current policies of the local permitting agency and should be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

- 1) Constructed treatment wetlands and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

- 1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement is required to ensure adequate performance and allow emergency access to the facilities.
- 2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.
- 3) An access ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.
- 4) All access ramps and roads should be provided in accordance with the current policies of the Flood Control District.

Vector Control

- 1) A Mosquito Management Plan or Service Contract should be approved or waived by the local Vector Control District for any facility that maintains a pool of water for 72 hours or more.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited. The use of galvanized fencing is permitted if in accordance with the Fencing requirement above.

Operations and Maintenance

Maintenance is of primary importance if constructed treatment wetlands basins are to continue to function as originally designed. A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

- 1) The constructed treatment wetlands basin should be inspected twice annually or more frequently, and inspections after major storm events are encouraged (see Appendix I for a constructed treatment wetland inspection and maintenance checklist). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.
- 2) Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site and to prevent clogging of outlets, creation of dead volumes, and barriers to mosquito fish to access pooled areas, and as follows:
- 3) Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.
- 4) Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
- 5) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the [encyclopededia](#) located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
- 6) Dead vegetation should be removed if it exceeds 10% of area coverage. This does not include seasonal die-back where roots would grow back later in colder areas. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.
- 7) Sediment buildup exceeding 6 inches over the storage capacity in the first cell should be removed. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include

commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill. Clean forebay every two years at a minimum, to avoid accumulation in main wetland area. Environmental regulations and permits may be involved with the removal of wetland deposits. When the main wetland area needs to be cleaned, it is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.

- 8) Repair erosion to banks and bottom as required.
- 9) Inspect outlet for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Correct observed problems as necessary.
- 10) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

TCM-4: Sand Filters

Sand filters operate much like bioretention facilities; however, instead of filtering stormwater through engineered soils, stormwater is filtered through a constructed sand bed with an underdrain system. Runoff enters the filter and spreads over the surface. As flows increase, water backs up on the surface of the filter where it is held until it can percolate through the sand. The treatment pathway is vertical (downward through the sand) to a perforated underdrain system that is connected to the downstream storm drainage system or to an infiltration facility. As stormwater passes through the sand, pollutants are trapped in the small pore spaces between sand grains or are adsorbed to the sand surface.



Application

- Adjacent to parking lots
- Road medians and shoulders
- Within open areas or play fields

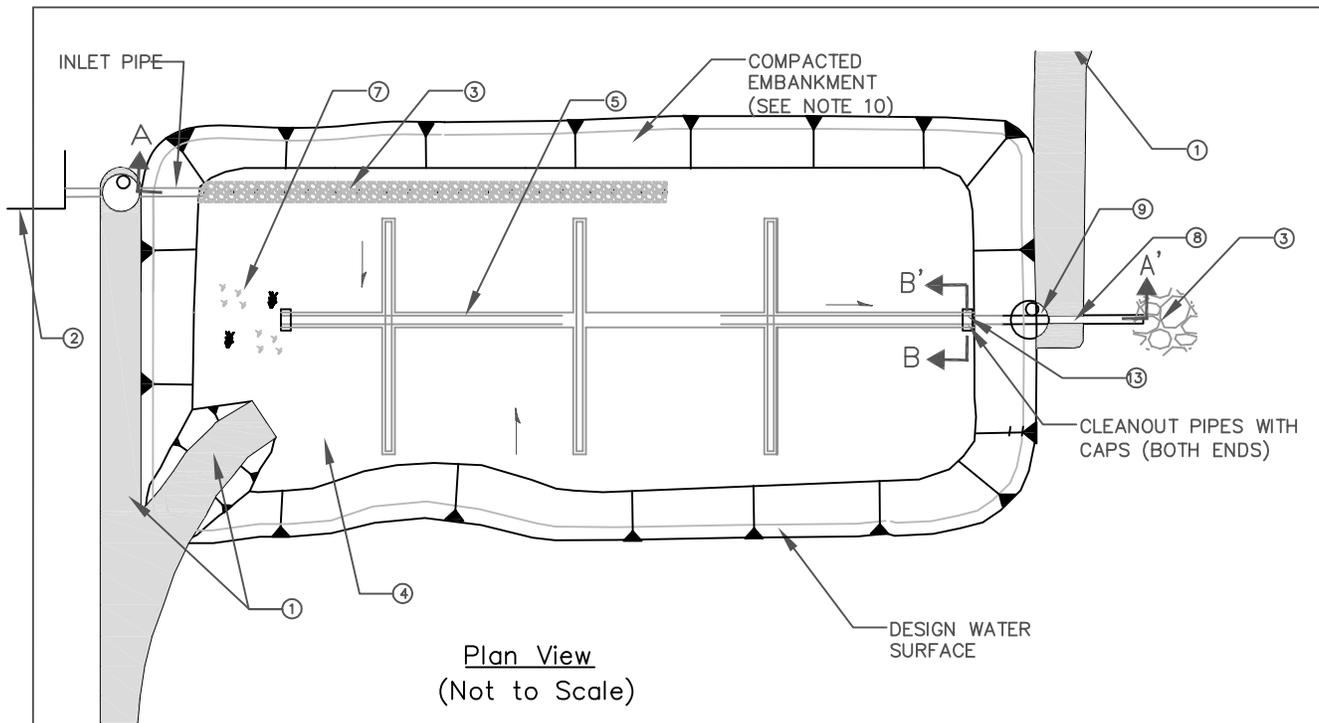
Preventative Maintenance

- Remove trash and debris, minor sediment accumulation, and obstructions near inlet and outlet structures
- Replace top 2” – 4” of sand
- Mow or weed surface of filter

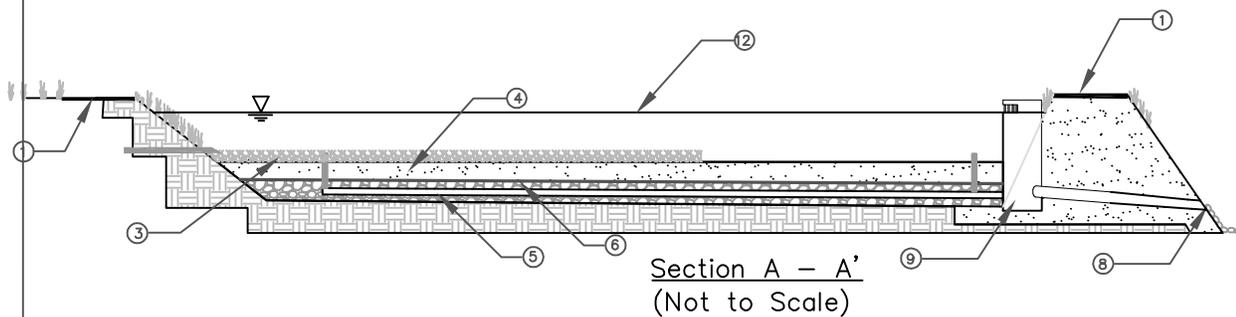


Sand filters connected to impervious surfaces

Photo Credits: Geosyntec Consultants



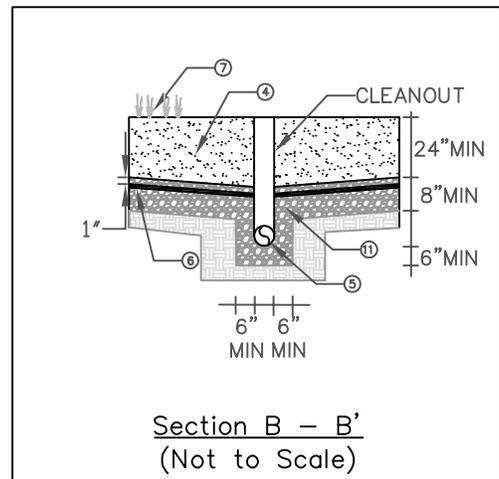
Plan View
(Not to Scale)



Section A - A'
(Not to Scale)

NOTES:

- ① INSTALL MAINTENANCE ACCESS ROAD AND RAMP TO BOTTOM OF SAND FILTER.
- ② UPSTREAM PRETREATMENT SHALL BE PROVIDED. IN THE ABSENCE OF PRETREATMENT, INCLUDE SEDIMENT FOREBAY WITH VOLUME EQUAL TO 10-20% OF TOTAL SAND FILTER VOLUME.
- ③ FLOW SPREADER TO EVENLY DISTRIBUTE FLOWS ALONG AT LEAST 20% OF PERIMETER.
- ④ FILTER BED SHALL BE A 24" MINIMUM SAND LAYER ON TOP OF 8" MINIMUM GRAVEL OR DRAIN ROCK BACKFILL.
- ⑤ 6" MINIMUM DIAMETER PERFORATED PIPE UNDERDRAIN SURROUNDED BY GRAVEL BEDDING. INSTALL AT 0.5% MINIMUM SLOPE
- ⑥ INSTALL GEOTEXTILE FABRIC OVERLAIN BY 1" OF DRAIN ROCK OR TRANSITIONALLY GRADED AGGREGATE BETWEEN SAND AND GRAVEL LAYER.
- ⑦ VEGETATION MAY BE PLANTED ON TOP OF FILTER BED. NO TOP SOIL SHALL BE ADDED TO FILTER BED.
- ⑧ SIZE OUTLET PIPE STRUCTURE TO PASS WATER QUALITY DESIGN STORM AND INCLUDE AN EMERGENCY OVERTFLOW.
- ⑨ EMERGENCY OVERTFLOW STRUCTURE.
- ⑩ ¾" - 1½" WASHED DRAIN ROCK OR GRAVEL LAYER.
- ⑪ DESIGN WATER SURFACE. 6' MAX PONDING DEPTH.



Section B - B'
(Not to Scale)

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Figure 6-23: Sand Filter

Limitations

Limitations for sand filters include:

- The sand filter should be located away from trees producing leaf litter or areas contributing significant eroded sediment to prevent clogging.
- Sand filters are should not be used in areas where heavy sediment loads are expected or in tributary areas that are not fully stabilized; high sediment loading rates may cause premature clogging of the filter. Pretreatment is essential.
- Site must have adequate relief between land surface and stormwater conveyance system to permit vertical percolation through the sand filter and collection and conveyance in the underdrain to stormwater conveyance system; four feet of elevation difference is recommended between the inlet and outlet of the filter.
- Not applicable in areas of high groundwater.
- Does not provide quantity control.

Design Criteria

The main challenge associated with sand filters is maintaining the filtration capacity, which is critical to the performance of this BMP. If flows entering the sand filter have high sediment concentrations, clogging of the sand filter is likely. Contribution of eroded soils or leaf litter may also reduce the infiltration and associated treatment capacity of the structure. Sand filters should be designed according to the requirements listed in Table 6-26 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-26: Sand Filter Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Max depth at SQDV	feet	3
Freeboard (minimum)	feet	1
Length to width ratio	L:W	2:1 (larger preferred)
Filter bed depth	inches	18 inches sand; 9 inches gravel
Max ponding depth above filter bed	feet	6
Drawdown time	Hours	?

Design Parameter	Unit	Design Criteria
Hydraulic conductivity of sand, k	in/hr	1 (equal to 2 ft/day)
Underdrains		6 inch minimum diameter; 0.5% minimum slope
Side slopes	H:V	4:1 (H:V) interior and 3:1 (H:V) exterior, unless stabilization has been approved by a licensed geotechnical engineer; or vertical concrete walls

Pretreatment

Pretreatment must be provided for sand filters in order to reduce the sediment load entering the filter. Pretreatment refers to design features that provide settling of large particles before runoff reaches the filter, easing the long-term maintenance burden. To ensure that pretreatment mechanisms are effective, designers shall incorporate pretreatment such as a biofiltration BMP, proprietary device, or sedimentation forebay. BMPs that are described in the 2011 TGM that may serve this purpose include:

For design specification of selected pre-treatment devices, refer to:

- [VEG-3: Vegetated swale](#)
- [VEG-4: Vegetated filter strip](#)
- [PROP-1: Hydrodynamic separation device](#)

Sizing Criteria

Background

Sand filter design is based on Darcy's law:

$$Q = KiA \quad \text{(Equation 6-104)}$$

Where:

Q = water quality design flow (cfs)

K = hydraulic conductivity (fps)

A = surface area perpendicular to the direction of flow (ft²)

i = hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = \frac{h+l}{l} \quad \text{(Equation 6-105)}$$

Where:

h = average depth of water above the filter (ft), defined for this design as $d/2$

d = maximum storage depth above the filter (ft)

l = thickness of sand media (ft)

Darcy's law underlies both the simple and the routing methods of design. The filtration rate V , or more correctly, $1/V$, is the direct input in the sand filter design. The relationship between the filtration rate V and hydraulic conductivity K is revealed by equating Darcy's law and the equation of continuity, $Q = VA$. Specifically:

$$Q = KiA \quad \text{and} \quad Q = VA$$

$$\text{So,} \quad VA = KiA$$

$$\text{Or:} \quad V = Ki \quad \text{(Equation 6-106)}$$

Where,

$$V = \text{filtration rate (ft/s)}$$

Note that $V \neq K$. That is, the filtration rate is not the same as the hydraulic conductivity, but they do have the same units (distance per time). K can be equated to V by dividing V by the hydraulic gradient i , which is defined above.

The hydraulic conductivity K does not change with head nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. A design hydraulic conductivity of 1 inch per hour (2 feet per day) used in this simple sizing method is based on bench-scale tests of conditioned rather than clean sand (KCSWDM, 2005) and represents the average sand bed condition as silt is captured and held in the sand bed.

Unlike the hydraulic conductivity, the filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design.

Simple Sizing Method

The simple sizing method does not route flows through the filter. It determines the size of the filter based on the simple assumption that inflow is immediately discharged through the filter as if there were no storage volume. An adjustment factor (0.7) is applied to compensate for the greater filter size resulting from this method. Even with the adjustment factor, the simple method generally produces a larger filter size than the routing method.

Step 1: Determine the water quality design volume

Sand filters should be sized to capture and treat the stormwater quality design volume (see [Section E.1](#)).

Step 2: Determine maximum storage depth of water

Determine the maximum water storage depth (d) above the sand filter. This depth is defined as the depth at which water begins to overflow the reservoir pond, and it depends on the site topography and hydraulic constraints. The depth is chosen by the designer, but should be 6 feet or less.

Step 3: Calculate the sand filter area

Determine the sand filter area using the following equation:

$$A_{sf} = \frac{V_{wq}RL}{Kt(h+L)} \quad \text{(Equation 6-107)}$$

Where,

A_{sf}	=	surface area of the sand filter bed (ft ²)
V_{wq}	=	water quality design volume (ft ³)
R	=	routing adjustment factor (use $R = 0.7$)
L	=	sand bed depth (ft)
K_{des}	=	design hydraulic conductivity of media (use 2 ft/day)
t	=	drawdown time (use 1 day)
h	=	average depth of water above the filter (ft), [use ($d/2$) with d from Step 2]

Routing Method

A continuous runoff model, such as US EPA's Stormwater Management Model (SWMM) Model, can be used to optimally size a sand filter. A continuous simulation model consists of three components: a representative long term period of rainfall data (\approx 20 years or greater) as the primary model input; a model component representing the tributary area to the sand filter that takes into account the amount of impervious area, soil types of the pervious area, vegetation, evapotranspiration, etc.; and a component that simulates the sand filter. Using this method, the filter should be sized to capture and treat the WQ design volume from the post-development tributary area.

The continuous simulation model routes predicted tributary runoff to the sand filter, where treatment is simulated as a function of the infiltrative (flow) capacity of the sand filter and the available storage volume above the sand filter. In a continuous runoff model such as SWMM, the physical parameters of the sand filter are represented with stage-storage-discharge relationships. Due to the computational power of ordinary desktop computers, long-term continuous simulations generally take only minutes to run. This allows the modeler to run several simulations for a range of sand filter sizes, varying either the surface area of the filter (and resulting flow capacity) or the storage capacity above the sand filter, or both. Sufficient continuous model simulations should be completed so that results encompass the WQ design volume capture goal.

Model results should be plotted for both varying storage depths above the filter and for varying filter surface area (and resulting flow capacity) while keeping all other parameters constant. The resulting relationship of percent capture as a function of sand filter flow and storage capacity can be used to optimally size a sand filter based on site conditions and restraints.

In addition to continuous simulation modeling, routing spreadsheets and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of sand filters may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices.

Sizing and Geometry

- 1) Sand filters shall be sized to capture and filter the Stormwater quality design volume, SQDV (See Section 2 and Appendix E for further detail).
- 2) Sand filters may be designed in any geometric configuration, but rectangular with a 2:1 length-to-width ratio or greater is preferred.
- 3) Filter bed depth must be at least 24 inches, but 36 inches is preferred.
- 4) Depth of water storage over the filter bed should be 6 feet maximum. Minimum freeboard is one foot.
- 5) Sand filters should be placed off-line to prevent scouring of the filter bed by high flows. The overflow structure must be designed to pass the stormwater quality design storm.

Sand Specification

Ideally the effective diameter of the sand, d_{10} (the diameter corresponding to the sieve size that passes 10% of sand grains), should be just small enough to ensure a good quality effluent while preventing penetration of stormwater particles to such a depth that they cannot be removed by surface scraping (~2-3 inches). This effective diameter usually lies in the range 0.20-0.35 mm. In addition, the coefficient of uniformity, $C_u = d_{60}/d_{10}$, should be less than 3.

The sand in a filter should consist of medium sand with few fines meeting ASTM C 33 size gradation (by weight) or equivalent as given in the table below.

U.S. Sieve Size	Percent Passing
3/8 inch	100
U.S. No. 4	95 to 100
U.S. No. 8	80 to 100
U.S. No. 16	50 to 85
U.S. No. 30	25 to 60
U.S. No. 50	5 to 30
U.S. No. 100	Less than 10

Finally, the silica (SiO_2) content of the sand should be greater than 95% by weight.

Underdrain

- 1) There are several underdrain system options which can be used in the design of a sand filter:
 - a. A central underdrain collection pipe with lateral collection pipes in an 8 inch minimum gravel backfill or drain rock bed.
 - b. Longitudinal pipes in an 8 inch minimum gravel backfill or drain rock bed, with a collection pipe at the outfall.
 - c. Small sand filters may use a single underdrain pipe in an 8 inch minimum gravel backfill or drain rock bed.
- 2) All underdrain pipes and connectors should be 6 inches or greater so they can be cleaned without damage to the pipe. Clean-out risers with diameters equal to the underdrain pipe should be placed at the terminal ends of all pipes and extend to the surface of the filter. A valve box should be provided for access to the cleanouts and the cleanout assembly should be water tight to prevent short circuiting of the sand filter.
- 3) The underdrain pipe should be sized and perforated as to ensure free draining of the sand filter bed. Round perforations should be at least 1/2-inch in diameter and the pipe should be laid with holes downward.
- 4) The maximum perpendicular distance between any two lateral collection pipes or from the edge of the filter and the collection pipes should be 9 feet.
- 5) All pipes should be placed with a minimum slope of 0.5%.
- 6) The invert of the underdrain outlet should be above the seasonal high groundwater level.

- 7) At least 8 inches of gravel backfill should be maintained over all underdrain piping, and at least 6 inches should be maintained on both side and beneath the pipe to prevent damage by heavy equipment during maintenance. Either drain rock or gravel backfill may be used between pipes.
- 8) The bottom gravel layer should have a diameter at least 2X the size of the openings into the drainage system. The grains should be hard, preferably rounded, with a specific gravity of at least 2.5, and free of clay, debris and organic impurities.
- 9) Either a geotextile fabric or a two-inch transition gradation layer (preferred) should be placed between the sand layer and the drain rock or gravel backfill layer. If a geotextile is used, one inch of drain rock or gravel backfill should be placed above the fabric. This allows for a transitional zone between sand and gravel and may reduce pooling of water at the liner interface. The geotextile should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Flow Spreader

- 1) A flow spreader should be installed at the inlet along one side of the filter to evenly distribute incoming runoff across the filter and to prevent erosion of the filter surface.
 - a. If the sand filter is curved or an irregular shape, a flow spreader should be provided for a minimum of 20 percent of the filter perimeter.
 - b. If the length-to-width ratio of the filter is 2:1 or greater, a flow spreader should be located on the longer side and for a minimum length of 20 percent of the facility perimeter.
 - c. In other situations, use good engineering judgment in positioning the spreader.
- 2) Erosion protection should be provided along the first foot of the sand bed adjacent to the flow spreader. Geotextile weighted with sand bags at 15-foot intervals may be used. Quarry spalls may also be used.

Vegetation

- 1) The use of vegetation in sand filters is optional. However, no top soil should be added to the sand filter bed because the fine-grained materials (silt and clay) would reduce the hydraulic capacity of the filter.
- 2) Growing grass or other vegetation requires the selection of species that can tolerate the demanding environment of a sand filter bed. Plants not receiving sufficient dry weather flows should be able to withstand long periods of drought during summer periods, followed by periods of saturation during storm events. A horticultural specialist should be consulted for advice on species selection.
- 3) A sod grown in sand may be used on the sand surface as long as there is no clay in the sand substrate and the particle size gradation of the substrate meets the sand filter specifications. No other sod should be used due to the high clay content in most sod soils.
- 4) To prevent uses that could compact and damage the filter surface, permanent structures are not permitted on sand filters (e.g. playground equipment).

Emergency Overflow Structure

Sand filters may only be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. The overflow structure must be able to safely convey flows from the stormwater quality design storm to the downstream conveyance system or other acceptable discharge point.

Side Slopes

- 1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.
- 2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.
- 3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.
- 4) Pond walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence, which prevents access, is provided along the top of the wall or further back, and (c) the design is stamped by a licensed civil engineer and approved by the County.

Embankments

- 1) Embankments (earthen slopes or berms) may be used for detaining or redirecting the flow of water.
- 2) The minimum top width of all berm embankments should be 20 feet, or as approved by the geotechnical engineer.
- 3) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed geotechnical engineer) free of loose surface soil materials, roots, and other organic debris.
- 4) Earthworks should be in accordance with Section 300-6 of the Standard Specifications for Public Works Construction, most recent edition.
- 5) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed geotechnical engineer.
- 6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

Maintenance Access

Maintenance access road(s) shall be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the bottom of the sand filter.

Landscaping Outside of the Facility

A sand filter can add aesthetics to a site and should be incorporated into a project's landscape design. Interior side slopes may be stepped with flat areas to provide informal seating with a game or play area below. Perennial beds may be planted above the overflow water surface elevation. Large shrubs and trees are not recommended, however, as shading limits evaporation and falling leaves can clog the filter surface. If a sand filter area is intended for recreational uses, such as a volleyball area, the interior side slopes of the filter embankment should be no steeper than 3:1 and may be stepped.

- 1) No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures.
- 2) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the

[encycloweedia](#) located at the California Department of Food and Agriculture website at or the California Invasive Plant Council website at www.cal-ipc.org.

Operations and Maintenance

Sand filters are subject to clogging by fine sediment, oil and grease, and other debris (e.g., trash and organic matter such as leaves). Filters and pretreatment facilities should be inspected every 6 months during the first year of operation. Inspection should also occur immediately following a storm event to assess the filtration capacity of the filter. Once the filter is performing as designed, the frequency of inspection may be reduced to once per year.

Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench. Regular inspection should determine if the sediment removal structures require preventative maintenance.

Inspect basin a minimum of twice a year, before and after the rainy season, after large storm events, or more frequently if needed. Some important items to check for include: differential settlement, cracking; erosion, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, outlet and pilot channels; sediment accumulation in the basin; and the vigor and density of the vegetation on the basin side slopes and floor. Correct observed problems as necessary.

- Remove litter and debris from banks and basin bottom as required.
- Repair erosion to banks and bottom as required.
- Check infiltration rate of sand bed twice annually, once after significant rainfall.
- Scarify top 3 to 5 inches of filters surface by raking once annually or as required to restore infiltration rate of the filter.
- Clean forebay every two years at a minimum, to avoid accumulation in main basin.
- Inspect outlet for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Correct observed problems as necessary.

TCM-5: Cartridge Media Filter

Cartridge media filters are manufactured devices that typically consist of a series of cylindrical vertical filters contained in a catch basin, manhole, or vault that provide treatment through filtration and sedimentation. The manhole or vault may be divided into multiple chambers where the first chamber acts as a pre-settling basin for removal of coarse sediment while another chamber acts as the filter bay and houses the filter cartridges.



Cartridge Media Filters

Photo Credits: Contech Stormwater Solutions, Inc.

Application

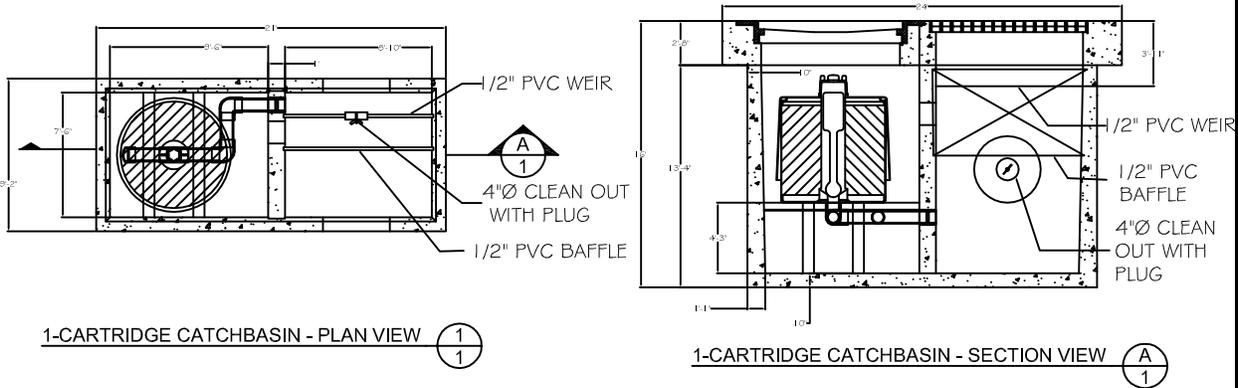
- Parking lots
- Roadways
- Playgrounds
- Outdoor eating areas

Preventative Maintenance

- Filter media replacement
- Solids removal from vault, manhole, or catch basin
- Inspect for inlet and outlet for clogging



STORMFILTER



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Up-Flo™ Filter
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 14 MODULE MAXIMUM

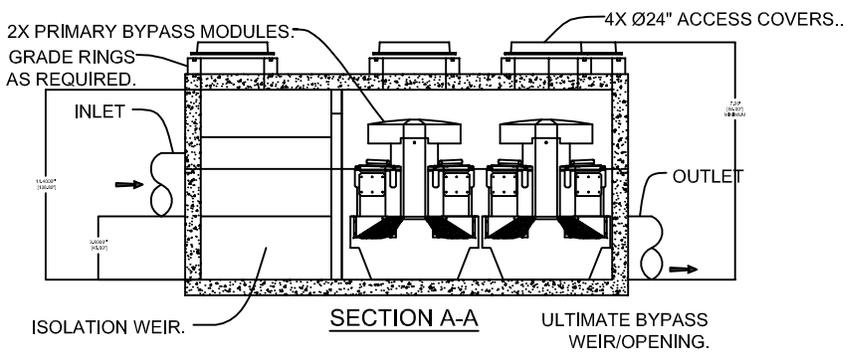
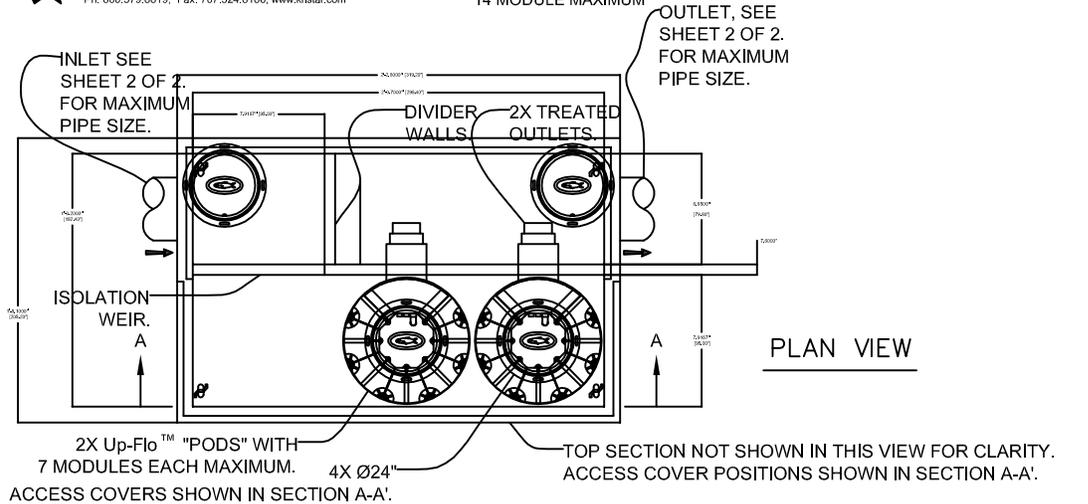


Figure 6-24: Cartridge Media Filter

Table 6-27: Proprietary Cartridge Media Filter Manufacturer Websites

Device	Manufacturer	Website
BaySaver BayFilter	Baysaver Technologies Inc.	www.baysaver.com
ConTech StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
CrystalStream	CrystalStream Technologies	www.crystalstream.com
KriStar Fossil Tee™ (media filter)	KriStar Enterprises Inc.	www.kristar.com
KriStar Up-Flo™ Filter and Perk™ Filter	KriStar Enterprises Inc.	www.kristar.com

Limitations

As with all filtration systems, use in catchments that have significant areas of non-stabilized soils can lead to premature clogging.

Design Criteria

- 1) Cartridge media filter BMP vendors are constantly updating and expanding their product lines, so refer to the latest design guidance from each of the vendors.
- 2) Selected filter media should target pollutants of concern. A combination of media is often recommended to maximize pollutant removal. Perlite is effective for removing TSS and oil and grease. Zeolite removes soluble metals, ammonium, and some organics. Vendors also offer proprietary medias (such as leaf compost or activated carbon) that are designed to remove soluble metals, organics, and other pollutants.
- 3) Manufacturers try to distinguish their products through innovative designs that aim at providing self cleaning and draining, uniformly loaded, and clog resistant cartridges that functional properly over a wide range of hydraulic loadings and pollutant concentrations.
- 4) All stormwater vaults containing cartridge filters that have standing water for longer than 72 hours can become a breeding area for mosquitoes. The selected BMP should have a system to completely drain the vault, such as weep holes in the bottom of the vault.

Sizing

- 1) Cartridge media filters should be sized to capture and treat the stormwater quality design flow rate.
- 2) Proprietary cartridge media filter devices, like most proprietary BMPs, and auxiliary components such as media, screens, baffles, and sumps are selected based onsite-specific conditions such as the loading that is expected and the desired frequency of maintenance. Sizing of proprietary devices is reduced to a simple process whereby a model can simply be selected from a table or a chart based on a few known quantities

(tributary area, location, design flow rate, etc). Most of the manufacturers either size the devices for potential clients or offer calculators on their websites that simplify the design process. For the latest sizing guidelines, refer to the manufacturer's website.

PT-1: Hydrodynamic Separation Device

Hydrodynamic separation devices (alternatively, swirl concentrators) are devices that remove trash, debris, and coarse sediment from incoming flows using screening, gravity settling, and centrifugal forces generated by forcing the influent into a circular motion. By having the water move in a circular fashion, rather than a straight line, it is possible to obtain significant removal of suspended sediments and attached pollutants with less space as compared to wet vaults and other settling devices. Hydrodynamic devices were originally developed for combined sewer overflows (CSOs), where they were used primarily to remove coarse inorganic solids. Hydrodynamic separation has been adapted for stormwater treatment by several manufacturers and is currently used to remove trash, debris, and other coarse solids down to sand-sized particles. Several types of hydrodynamic separation devices are also designed to remove floating oils and grease using sorbent media.



Hydrodynamic Separation

*Photo Credits: 1. Contech Stormwater Solutions, Inc.;
2. Dave Weller, FedCo Construction*

Application

- Parking lots
- Areas adjacent to parking lots
- Areas adjacent to buildings
- Road medians and shoulders

Preventative Maintenance

- Sediment, trash and debris removal
- Vector control

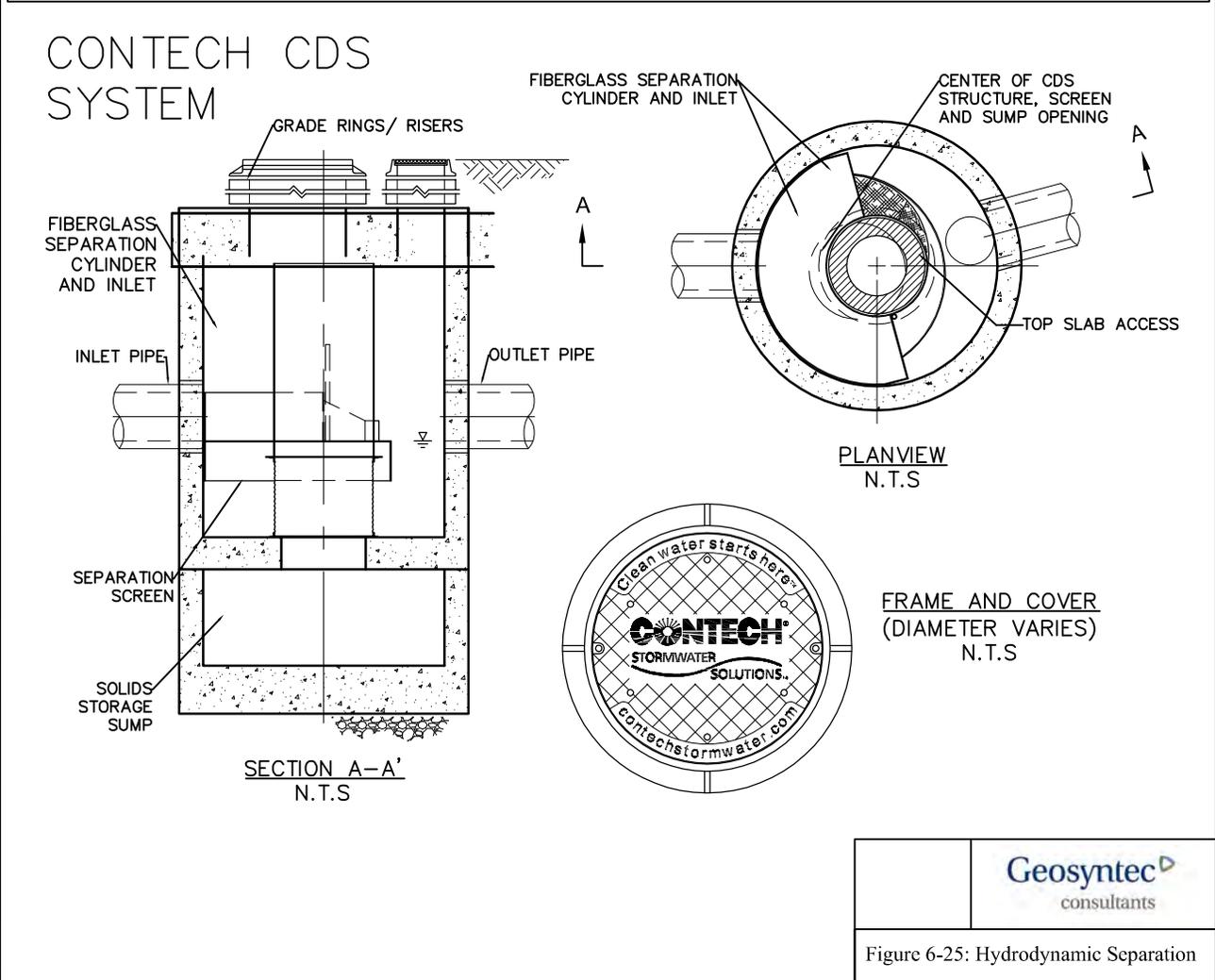
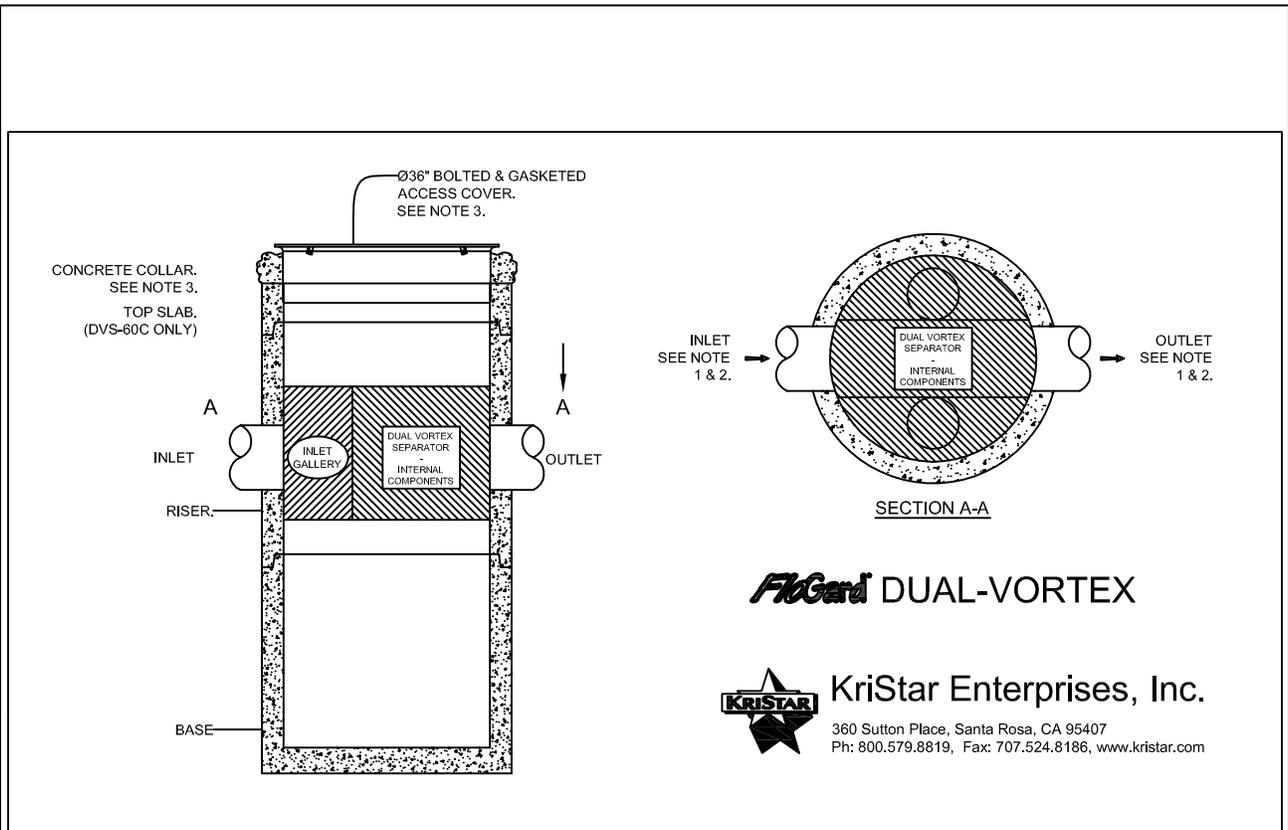


Table 6-28: Proprietary Hydrodynamic Device Manufacturer Websites

Device	Manufacturer	Website
Rinker In-Line Stormceptor®	Rinker Materials™	www.rinkerstormceptor.com
FloGard® Dual-Vortex Hydrodynamic Separator	KriStar Enterprises Inc.	www.kristar.com
Contech® CDS ^a ™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Vortechs™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® VorSentry™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® VorSentry™ HS	Contech® Construction Products Inc.	www.contech-cpi.com
BaySaver BaySeparator	Baysaver Technologies Inc.	www.baysaver.com

Limitations

Hydrodynamic separation devices are effective for the removal of coarse sediment, trash, and debris, and are useful as pretreatment in combination with other BMP types that target smaller particle sizes.

Hydrodynamic devices represent a wide range of device types that have different unit processes and design elements (e.g., storage versus flow-through designs, inclusion of media filtration, etc.) that vary significantly within the category. These design features likely have significant effects on BMP performance; therefore, generalized performance data for hydrodynamic devices is not practical.

Design Criteria

Proprietary hydrodynamic device BMP vendors are constantly updating and expanding their product lines, so refer to the latest design guidance from each of the vendors. General guidelines on the performance, sizing, operations and maintenance of proprietary devices are provided by the vendors.

Sizing

Hydrodynamic devices shall be sized to capture and treat the stormwater quality design flow rate and to completely drain within 72 hours.

Sizing of proprietary devices is reduced to a simple process whereby a model can simply be selected from a table or a chart based on a few known quantities (tributary area, location, design flow rate, design volume, etc). A few of the manufacturers either size the devices for potential clients or offer calculators on their websites that simplify the design process even further and lessens the possibility of using obsolete design information. For the latest sizing guidelines, refer to the manufacturer's website.

The hydrodynamic separators listed in Table 6-28 are designed to have a permanent pool of water stored within the system. Various methods of vector control are available to prevent mosquito breeding including manhole cover screens and the use of mosquito dunks. In many designs, oil and grease is stored at the water surface and provides a deterrent to mosquito breeding.

Operations and Maintenance

Hydrodynamic devices should be inspected every 6 months during the first year of operation. Inspection should also occur immediately following a storm event to assess the function of the device. Once the device is performing as designed, the frequency of inspection may be reduced to once per year.

PT-2: Catch Basin Insert

Catch basin inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris and may include sorbent media (oil absorbent pouches) to remove floating oils and grease. Catch basin inserts are selected specifically based upon the orientation of the inlet.



Application

- Parking lots
- Roads
- Athletic courts
- Outdoor food areas

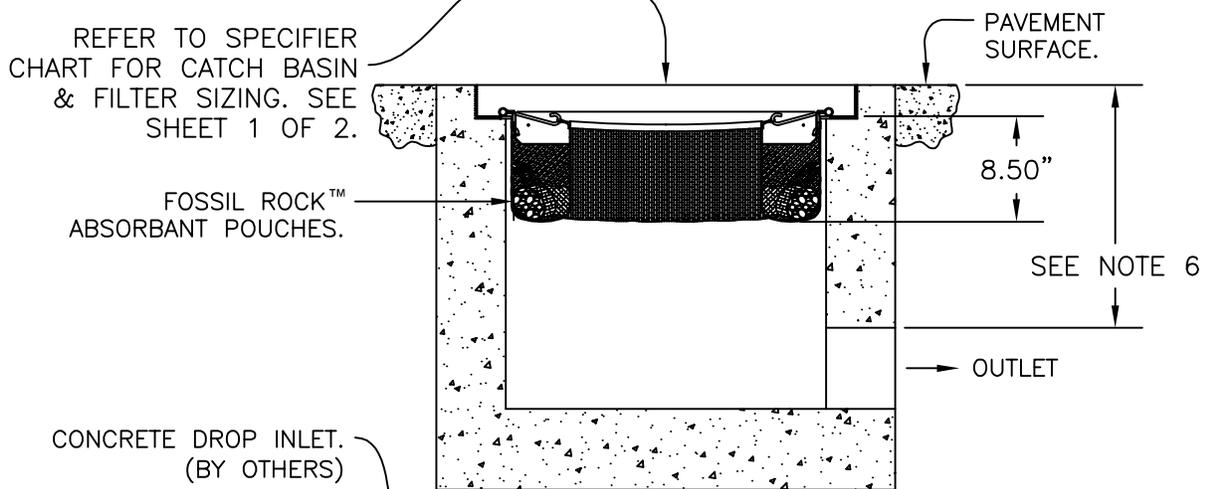
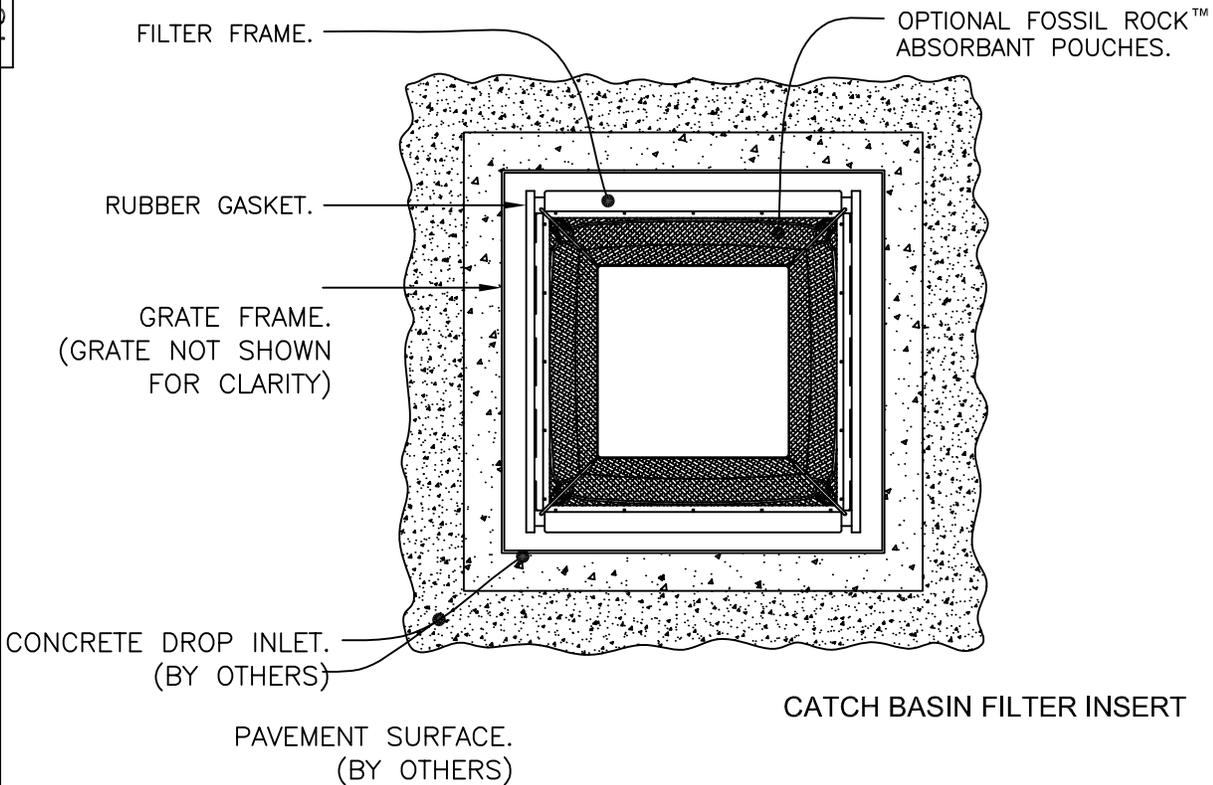
Preventative Maintenance

- After storm inspection
- Sediment removal
- Trash removal
- Filter/sorbent media replacement



Catch Basin Inserts

Photo Credits: 1. KriStar; 2. Aquashield



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FloGard

Geosyntec
consultants

Figure 6-26: Catch Basin

Table 6-29: Proprietary Catch Basin Insert Manufacturer Websites

Device	Manufacturer	Website
AbTech Industries Ultra-Urban Filter™	AbTech Industries	www.abtechindustries.com
Aquashield Aqua-Guardian™ Catch Basin Insert	Aquashield™ Inc.	www.aquashieldinc.com
Bowhead StreamGuard™	Aquashield™ Inc.	www.aquashieldinc.com
Contech® Triton Catch Basin Filter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Triton Curb Inlet Filter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Triton Basin StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Curb Inlet StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
Curb Inlet Basket	SunTree Technologies Inc.	www.suntreetech.com
Curb Inlet Grates	EcoSense International™	www.ecosenseinternational.org
Grate Inlet Skimmer Box	SunTree Technologies Inc.	www.suntreetech.com
Hydro-Kleen™ Filtration System	Hydro Compliance Management Inc.	Not available
KriStar FloGard +PLUS®	KriStar Enterprises Inc.	www.kristar.com
KriStar FloGard®	KriStar Enterprises Inc.	www.kristar.com
KriStar FloGard LoPro Matrix Filter®	KriStar Enterprises Inc.	www.kristar.com
Nyloplast Storm-PURE Catch Basin Insert	Nyloplast Engineered Surface Drainage Products	www.nyloplast-us.com
StormBasin®	FabCo® Industries Inc.	www.fabco-industries.com
Stormdrain Solutions Interceptor	FabCo® Industries Inc.	www.fabco-industries.com
Stormdrain Solutions Inceptor®	Stormdrain Solutions	www.stormdrains.com
StormPod®	FabCo® Industries Inc.	www.fabco-industries.com
Stormwater Filtration Systems	EcoSense International™	www.ecosenseinternational.org
Ultra-CurbGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-DrainGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-GrateGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-GutterGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-InletGuard®	UltraTech International Inc.	www.spillcontainment.com

Limitations

Catch basin inserts come in such a wide range of configurations that it is practically impossible to generalize the expected performance. Inserts should mainly be used for catching coarse sediments and floatable trash, and are effective as pretreatment in combination with other types of structures that are recognized as water quality treatment BMPs. Trash and large objects can greatly reduce the effectiveness of catch basin inserts with respect to sediment and hydrocarbon capture. Frequent

maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.

Design Criteria

Catch basin inserts shall be sized to capture and treat the stormwater quality design flow rate.

Operations and Maintenance

- 1) Trash, debris, and sediment around insert grate and inside chamber requiring trash to be cleared.
- 2) Repair filter media if damaged or severely clogged.
- 3) Inspection of catch basin insert after each storm greater than 0.2 inches is recommended.

7 MAINTENANCE PLAN

This chapter identifies the basic information that should be included in a maintenance plan. Refer to Fact Sheets for individual control measures in Chapter 6 regarding device-specific maintenance requirements.

7.1 Site Map

- 1) Provide a site map showing boundaries of the site, acreage and drainage patterns/contour lines. Show each discharge location from the site and any drainage flowing onto the site. Distinguish between soft and hard surfaces on the map.
- 2) Identify locations of existing and proposed storm drain facilities, private sanitary sewer systems and grade-breaks for purposes of pollution prevention.
- 3) With legend, show locations of expected sources of pollution generation (outdoor work and storage areas, heavy traffic areas, delivery areas, trash enclosures, fueling areas, industrial clarifiers, wash-racks, etc). Identify any areas having contaminated soil or where toxins are stored or have been stored/disposed of in the past.
- 4) With legend, indicate types and locations of stormwater management control measures which will be built to permanently control stormwater pollution. Distinguish between pollution prevention, treatment, sewer diversion, and containment devices.

7.2 Baseline Descriptions

- 1) List the property owners and persons responsible for operation and maintenance of the stormwater management control measures onsite. Include phone numbers and addresses.
- 2) Identify the intended method of providing financing for operation, inspection, routine maintenance and upkeep of stormwater control measures.
- 3) List all permanent stormwater control measures. Provide a brief description of stormwater management control measures selected and if appropriate, facts sheets or additional information.
- 4) As appropriate for each stormwater control measure provide:
 - a. A written description and check list of all maintenance and waste disposal activities that will be performed. Distinguish between the maintenance appropriate for a 2-year establishment period and expected long-term maintenance. For example, maintenance requirements for vegetation in a constructed wetland may be more intensive during the first few years until the vegetation is established. The post-establishment maintenance

plan should address maintenance needs (e.g., pruning, irrigation, weeding) for a larger, more stable system. Include maintenance performance procedures for facility components that require relatively unique maintenance knowledge, such as specific plant removal / replacement, landscape features, or constructed wetland maintenance. These procedures should provide enough detail for a person unfamiliar with maintenance to perform the activity, or identify the specific skills or knowledge necessary to perform and document the maintenance.

- b. A description of site inspection procedures and documentation system, including record-keeping and retention requirements.
 - c. An inspection and maintenance schedule, preferably in the form of a table or matrix, for each activity for all facility components. The schedule should demonstrate how it will satisfy the specified level of performance, and how the maintenance / inspection activities relate to storm events and seasonal issues.
 - d. Identification of the equipment and materials required to perform the maintenance.
- 5) As appropriate, list all housekeeping procedures for prohibiting illicit discharges or potential illicit discharges to the storm drain. Identify housekeeping BMPs that reduce maintenance of Treatment Control Measures. These procedures are listed based on facility operations and can be found in the Ventura County Industrial/Commercial Clean Business Program document.

7.3 Spill Plan

- 1) Provide emergency notification procedures (phone and agency/persons to contact)
- 2) As appropriate for site, provide emergency containment and cleaning procedures.
- 3) Note downstream receiving water bodies or wetlands which may be affected by spills or chronic untreated discharges.
- 4) As appropriate, create an emergency sampling procedure for spills. (Emergency sampling can protect the property owner from erroneous liability for downstream receiving area clean-ups).

7.4 Facility Changes

Operational or facility changes which significantly affect the character or quantity of pollutants discharging into the stormwater management control measures will require modifications to the Maintenance Plan and/or additional stormwater control measures.

7.5 Training

- 1) Identify appropriate persons to be trained and assure proper training.
- 2) Training to include:
 - a. Good housekeeping procedures defined in the plan.
 - b. Proper maintenance of all pollution mitigation devices.
 - c. Identification and cleanup procedures for spills and overflows.
 - d. Large-scale spill or hazardous material response.
 - e. Safety concerns when maintaining devices and cleaning spills.

7.6 Basic Inspection and Maintenance Activities

- 1) Create and maintain onsite, a log for inspector names, dates and stormwater control measure devices to be inspected and maintained. Provide a checklist for each inspection and maintenance category.
- 2) Once annually, perform testing of any mechanical or electrical devices prior to wet weather.
- 3) Report any significant changes in stormwater management control measures to the site management. As appropriate, assure mechanical devices are working properly and/or landscaped BMP plantings are irrigated and nurtured to promote thick growth.
- 4) Note any significant maintenance requirements due to spills or unexpected discharges.
- 5) As appropriate, perform maintenance and replacement as scheduled and as needed in a timely manner to assure stormwater management control measures are performing as designed and approved.
- 6) Assure unauthorized low-flow discharges from the property do not by-pass stormwater control measures.
- 7) Perform an annual assessment of each pollution generation operation and its associated stormwater management control measures to determine if any part of the pollution reduction train can be improved.

7.7 Revisions of Pollution Mitigation Measures

If future correction or modification of past stormwater management control measures or procedures is required, the owner shall obtain approval from the governing stormwater

agency prior to commencing any work. Corrective measures or modifications shall not cause discharges to bypass or otherwise impede existing stormwater control measures.

7.8 Monitoring & Reporting Program

- 1) The governing stormwater agency may require a Monitoring & Reporting Program to assure the stormwater management control measures approved for the site are performing according to design.
- 2) If required by local permitting agency, the Maintenance Plan shall include performance testing and reporting protocols.

APPENDIX A : ACRONYMS AND GLOSSARY OF TERMS

A.1 Acronyms and Abbreviations

303(d) 303(d) List of Impaired Water Bodies

API	American Petroleum Institute (oil/water separator type)
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CP	Coalescing Plate (oil/water separator type)
CTR	California Toxics Rule
CWA	Clean Water Act
CDFG	California Department of Fish and Game
EIA	Effective Impervious Area
EMC	Event Mean Concentration
ESA	Environmentally Sensitive Area
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
RPAMP	Redevelopment Project Area Master Plan
SQDV	Stormwater Quality Design Volume
SQDF	Stormwater Quality Design Flow
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WERF	Water Environment Research Foundation

A.2 Glossary

Automotive Repair Shop: A facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Backfill: Earth or engineered material used to refill a trench or an excavation.

Berm: An earthen mound used to direct the flow of runoff around or through a structure.

Best Management Practice (BMP): Any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

Best Management Practices (BMPs): Includes schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Biofiltration: The simultaneous process of filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater that takes place when runoff flows over and through vegetated areas.

Bioretention Facility: A facility that utilizes soil infiltration and both woody and herbaceous plants to remove pollutants from stormwater runoff. Runoff is typically captured and infiltrated or released over a period of 24 to 48 hours.

Blue Roof: A roof that is designed to store rainwater, typically in a cistern-type device.

Brown Roof: A type of green roof which focuses on biodiversity and locally-sourced material.

Buffer Strip or Zone: Strip of erosion-resistant vegetation over which stormwater runoff is directed.

Capacity: The capacity of a stormwater drainage facility is the flow volume or rate that the facility (e.g., pipe, basin, vault, swale, ditch, drywell, etc.) is designed to safely contain, receive, convey, reduce pollutants from, or infiltrate stormwater to meet a specific performance standard. There are different performance standards for pollution reduction, flow control, conveyance, and destination/ disposal, depending on location.

Catch Basin: Box-like underground concrete structure with openings in curbs and gutters designed to collect runoff from streets and pavements.

Check Dam: Small temporary barrier, grade control structure, or dam constructed across a swale, drainage ditch, or area of concentrated flow with the intent to slow or stop runoff.

Clean Water Act (CWA): (33 U.S.C. 1251 et seq.) requirement of the National Pollutant Discharge Elimination System (NPDES) program are defined under Sections 307, 402, 318 and 405 of the CWA.

Commercial Development: Any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

Conduit: Any channel or pipe for directing the flow of water.

Construction General Permit: A NPDES permit issued by the State Water Resources Control Board (SWRCB) for the discharge of stormwater associated with construction activity from soil disturbance of five (5) acres or more.

Control Device: A device used to hold back or direct a calculated amount of stormwater to or from a stormwater management facility. Typical control structures include vaults or manholes fitted with baffles, weirs, or orifices.

Conveyance System: Any channel or pipe for collecting and directing the Stormwater.

Culvert: A covered channel or a large diameter pipe that crosses under a road, sidewalk, etc.

Dead-end Sump: A below surface collection chamber for small drainage areas that is not connected to the public storm drainage system. Accumulated water in the chamber must be pumped and disposed in accordance with all applicable laws.

Designated Public Access Points: Any pedestrian, bicycle, equestrian, or vehicular point of access to jurisdictional channels in the area of Ventura County subject to permit requirements.

Detention: The temporary storage of stormwater runoff to allow treatment by sedimentation and metered discharge of runoff at reduced peak flow rates.

Detention Facility: A facility designed to receive and hold stormwater and release it at a slower rate, usually over a number of hours. The full volume of stormwater that enters the facility is eventually released.

Detention Tank, Vault, or Oversized Pipe: A structural subsurface facility used to provide flow control for a particular drainage basin.

Development: any construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail and any other non-residential projects, including public agency projects; or mass grading for future construction.

Directly Adjacent: Situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of the environmentally sensitive area.

Directly Connected Impervious Area (DCIA): The area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. turf buffers).

Directly Discharging: Outflow from a drainage conveyance system that is composed entirely or predominantly of flows from the subject, property, development, subdivision, or industrial facility, and not commingled with the flows from adjacent lands.

Discharge: A release or flow of Stormwater or other substance from a conveyance system or storage container.

Disturbed Area: Any area that is altered as a result of land disturbance, such as: clearing, grading, grubbing, stockpiling and excavation.

Drainage Basin: A specific area that contributes stormwater runoff to a particular point of interest, such as a stormwater management facility, drainageway, wetland, river, or pipe.

Effective Impervious Area (EIA): That portion of the surface area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume.

Environmentally Sensitive Area (ESA): An area “in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments” (California Public Resources Code § 30107.5). Areas subject to stormwater mitigation requirements are: 303(d) listed water bodies in all reaches that are unimproved, all California Coastal Commission’s *Environmentally Sensitive Habitat Areas* as delineated on maps in Local Coastal Plans, and Regional Water Quality Control Board’s Basin Plan Rare, Threatened or Endangered Species (RARE) and Preservation of Biological Habitats (BIOL) designated waterbodies. The California Department of Fish and Game’s (CDFG) *Significant Natural Areas* map will be considered for inclusion as the department field-verifies the designated locations. Watershed restoration projects will be considered for inclusion as the department field verifies the designated locations.

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or runoff, but can be intensified by land-clearing practices relating to farming; residential, commercial, or industrial development; road building; or timber cutting.

Excavation: The process of removing earth, stone, or other materials, usually by digging.

Existing Urban Area: Existing urban areas and corresponding maps in Appendix B are based on the cities' City Urban Restriction Boundaries (CURB) lines and the Existing Community designation in the unincorporated County. These boundaries are a growth management tool intended to channel growth and protect agricultural and open-space land. The 2011 TGM utilizes existing urban areas (as defined in Appendix B) to provide parameters around eligibility for alternative compliance in two areas: 1) Smart Growth and 2) low income housing projects.

Extended Detention Basin: A surface vegetated basin used to provide flow control for a particular drainage basin. Stormwater temporarily fills the extended detention basin during large storm events and is slowly released over a number of hours, reducing peak flow rates.

Facility: Is a collection of industrial process discharging stormwater associated with industrial activity within the property boundary or operational unit.

Filter Fabric: Geotextile of relatively small mesh or pore size that is used to: (a) allow water to pass through while keeping sediment out (permeable); or (b) prevent both runoff and sediment from passing through (impermeable).

Filter Strip: A gently sloping, densely grassed area used to filter, slow, and infiltrate stormwater.

Flow Control Facility: Any structure or drainage device that is designed, constructed, and maintained to collect, retain, infiltrate, or detain surface water runoff during and after a storm event for the purpose of controlling post-development quantity leaving the site.

Flow Control: The practice of limiting the release of peak flow rates, flow durations, and volumes from a site. Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increased stormwater runoff flow rates and volumes resulting from development.

Grading: The cutting and/or filling of the land surface to a desired shape or elevation.

Green Roof: A roofing system that layers a soil/vegetative cover over a waterproofing membrane. Green roofs rely on highly porous media and moisture retention layers to store intercepted precipitation and to support vegetation that can reduce the volume of stormwater runoff via evapotranspiration

Hazardous Substance: (1) Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive; (2) Any substance named by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted into the environment.

Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (flammable, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Hillside: Property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25 percent or greater.

Hydrodynamic Separation: Flow-through structures with a settling or separation unit to remove sediments and other pollutants in which no outside power source is required, because the energy of the flowing water allows the sediments to efficiently separate. Depending on the type of unit, this separation may be by means of swirl action or indirect filtration.

Illegal Discharges: Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges authorized by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

Impervious Surface / Area: A hard surface area which either prevents or retards the entry of water into the predevelopment soil mantle. A hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under predevelopment conditions. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, (impermeable) concrete or asphalt paving, gravel roads, packed earthen materials, and oiled macadam or other surfaces which similarly impede the natural infiltration of storm water.

Industrial General Permit: A NPDES permit issued by the State Water Resources Control Board for the discharge of Stormwater associated with industrial activity.

Infiltration: The downward entry of water into the surface of the soil.

Infiltration Trench: A linear excavation, backfilled with gravel, used to filter pollutants and infiltrate storm water.

Integrated Pest Management Plan (IPMP): A balanced approach to pest management which incorporates the many aspects of plant health care in ways that mitigate harmful environmental impacts and protect human health.

Inlet: An entrance into a ditch, storm sewer, or other waterway.

Legacy Pollutants: Pollutants that are no longer in production but remain in site soils and groundwater and still have the potential to cause ecological and water quality impacts.

Material Storage Areas: On site locations where raw materials, products, final products, by-products, or waste materials are stored.

Maximum Extent Practicable (MEP): The technology-based permit requirement established by Congress in CWA section 402(p)(3)(B)(iii) that municipal dischargers of stormwater must meet. Technology-based requirements, including MEP, establish a level of pollutant control that is derived from available technology or other controls. MEP requires municipal dischargers to perform at maximum level that is practicable. Compliance with MEP may be achieved by emphasizing pollution prevention and source control BMPs in combination with structural and treatment methods where appropriate. The MEP approach is an ever evolving and advancing concept, which considers technical and economic feasibility.

Municipal Separate Storm Sewer System (MS4) Permit : A NPDES permit issued by the Regional Water Quality Control Board for the discharge of Stormwater from Municipal Separate Storm Sewer Systems.

New Development: Land disturbing activities; structural development, including construction or installation of a building or structure, creation and replacement of impervious surfaces; and land subdivision.

Non-Stormwater Discharge: Any discharge to municipal separate storm drain that is not composed entirely of stormwater. Discharges containing process wastewater, non-contact cooling water, or sanitary wastewater are non-stormwater discharges.

Non-Structural Source Control Measure: Low technology, low cost activities, procedures or management practices designed to prevent pollutants associated with site functions and activities from being discharged with Stormwater runoff. Examples include good housekeeping practices, employee training, standard operating practices, inventory control measures, etc.

Notice of Intent (NOI): A formal notice to State Water Resources Control Board submitted by the owner/developer that a construction project is about to begin. The NOI provides information on the owner, location, type of project, and certifies that the permittee will comply with the conditions of the construction general permit.

NPDES Permit: An authorization, license, or equivalent control document issued by EPA or an approved State agency to implement the requirements of the NPDES program.

Operations and Maintenance (O&M): The continuing activities required to keep storm water management facilities and their components functioning in accordance with design objectives.

Outfall: The point where stormwater discharges from a pipe, channel, ditch, or other conveyance to a waterway.

Parking Lot: Land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with an impervious surface area of 5,000 square feet or more, or with 25 or more parking spaces.

Permeability: A property of soil that enables water or air to move through it. Usually expressed in inches/hour or inches/day.

Pervious Surface/Area: A surface or area with a surface (i.e., soil, loose rock, permeable pavement, etc.) that allows water to infiltrate (soak) into the ground.

Planter Box: A structural facility filled with topsoil and gravel and planted with vegetation. The planter is completely sealed, and a perforated collection pipe is placed under the soil and gravel, along with an overflow provision, and directed to an acceptable destination point. The storm water planter receives runoff from impervious surfaces, which is filtered and retained for a period of time.

Pollutant: An elemental or physical material that can be mobilized or dissolved by water or air and creates a negative impact to human health and/ or the environment. Pollutants include suspended solids (sediment), heavy metals (such as lead, copper, zinc, and cadmium), nutrients (such as nitrogen and phosphorus), bacteria and viruses, organics (such as oil, grease, hydrocarbons, pesticides, and fertilizers), floatable debris, and increased temperature.

Pollutants of Concern: constituents that have exceeded Basin Plan Objectives, and California Toxics Rule chronic or acute objectives during monitoring at mass emission, receiving water, and land use stations.

Pollution Reduction: The practice of filtering, retaining, or detaining surface water runoff during and after a storm event for the purpose of maintaining or improving surface and/or groundwater quality.

Precipitation: Any form of rain or snow.

Predevelopment: The existing land use condition prior to the proposed development activity.

Practicable: Available and capable of being done, after taking into consideration existing technology, legal issues, and logistics in light of overall project purpose.

Pre-developed Condition: the native vegetation and soils that existed at a site prior to first development. The pre-developed condition may be assumed to be the

typical vegetation, soil, and stormwater runoff characteristics of open space areas in coastal Southern California unless reasonable historic information is provided that the area was atypical.

Pre-project Condition: the condition of the site at the time of the proposed project.

Pretreatment: Treatment of wastewater before it is discharged to a wastewater collection system.

Process Wastewater: Wastewater that has been used in one or more industrial processes.

Project: development, redevelopment, and land disturbing activities. The term is not limited to “project” as defined under CEQA (Reference: California Public Resources Code § 21065).

Public Facility: A street, right-of-way, park, sewer, drainage, storm water management, or other facility that is either currently owned by the City/County or will be conveyed to the City/County for maintenance responsibility after construction.

Rainwater Harvesting: Rainwater harvesting is a BMP that stores and uses rainwater or stormwater runoff. This is consistent with the use of the term “reuse” contained in Order R4-2010-0108.

Receiving Stream: (for purposes of this Manual only) any natural or man-made surface water body that receives and conveys stormwater runoff.

Redevelopment: Land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of a routine maintenance activity; and land disturbing activities related to structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety. Note: redevelopment as defined here is not the same as a “Redevelopment Project” as defined by California redevelopment law.

Redevelopment Project Area Master Plan (RPAMP): A plan submitted to the Regional Water Board for approval by a Permittee or a coalition of Permittees to establish standards for redevelopment projects within Redevelopment Project Areas, in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements. See Section 4.E.IV.3 of [Order R4-2010-0108](#).

Restaurant: A stand-alone facility that sells prepared foods and/or drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and/or drinks for immediate consumption (SIC code 5812).

Retail Gasoline Outlet: Any facility engaged in selling gasoline and lubricating oils.

Retention Facility: A facility designed to receive and hold stormwater runoff. Rather than storing and releasing the entire runoff volume, retention facilities permanently retain a portion of the water on-site, where it infiltrates, evaporates, or is absorbed by surrounding vegetation. In this way, the full volume of storm water that enters the facility is not released off-site.

Retrofit: Retrofit projects implement structural treatment BMPs as a stand-alone project, without other site improvements. The BMP sizing requirements of this Technical Guidance Manual do not apply to retrofit projects.

Runoff: Water originating from rainfall and other precipitations (e.g., sprinkler irrigation) that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, wetlands, and shallow groundwater.

Runon: Stormwater surface flow or other surface flow which enters property other than that where it originated.

Secondary Containment: Structures, usually dikes or berms, surrounding tanks or other storage containers and designed to catch spilled material from the storage containers.

Sedimentation: The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

Sediments: Soil, sand, and minerals washed from land into water usually after rain, that accumulate in reservoirs, rivers, and harbors, destroying aquatic animal habitat and clouding the water so that adequate sunlight might not reach aquatic plants.

Site: land or water area where any “facility” or “activity” is physically located or conducted including adjacent land used in connection with the facility or activity.

Source Control BMP or Measure: Any schedules of activities, structural devices, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent Stormwater pollution by reducing the potential for contamination at the source of pollution.

Source Control BMPs: Operational practices or design features that prevent pollution by reducing potential pollutants at the source.

Spill Guard: A device used to prevent spills of liquid materials from storage containers.

Spill Prevention Control and Countermeasures Plan (SPCC): Plan consisting of structures, such as curbing, and action plans to prevent and respond to spills of hazardous substances as defined in the Clean Water Act.

Storm Drains: Above and below ground structures for transporting stormwater to streams or outfalls for flood control purposes.

Storm Drain System: Network of above and below-ground structures for transporting stormwater to streams or outfalls.

Storm Event: A rainfall event that produces more than 0.1 inch of precipitation and is separated from the previous storm event by at least 72 hours of dry weather.

Stormwater Discharge Associated with Industrial Activity: Discharge from any conveyance which is used for collecting and conveying stormwater which is related to manufacturing processing or raw materials storage areas at an industrial plant [see 40 CFR 122.26(b)(14)].

Stormwater: Stormwater runoff, snow-melt runoff, surface runoff, and drainage, excluding infiltration and irrigation tailwater.

Structural BMP or Control Measure: Any structural facility designed and constructed to mitigate the adverse impacts of stormwater and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

Total Project Area: Total project area (or “gross project area”) for new development and redevelopment projects is the disturbed, developed, and undisturbed portions within the project’s property (or properties) boundary, at the project scale submitted for first approval. Areas proposed to be permanently dedicated for open space purposes as part of the project are explicitly included in the "total project area." Areas of land precluded from development through a restrictive covenant, conservation easement, or other recorded document for the permanent preservation of open space prior to project submittal shall not be included in the "total project area."

Total Suspended Solids (TSS): Matter suspended in stormwater excluding litter, debris, and other gross solids exceeding 1 millimeter in diameter.

Treatment Control BMP or Measure: Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Treatment: The application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

Tributary Area: The area from which all runoff produced flows to the same specific discharge point.

Vegetated Facilities: Stormwater management facilities that rely on plantings to enhance their performance. Plantings can provide wildlife habitat and enhance many facility functions, including infiltration, pollutant removal, water cooling, flow calming, and prevention of erosion.

Vegetated Swale: A long and narrow, trapezoidal or semicircular channel, planted with a variety of trees, shrubs, and grasses or with a dense mix of grasses. Stormwater runoff from impervious surfaces is directed through the swale, where it is slowed and in some cases infiltrated, allowing pollutants to settle out. Check dams are often used to create small ponded areas to facilitate infiltration.

APPENDIX B : MAPS

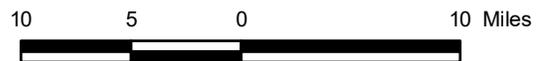
NOTES:

1. Contact the local permitting authority for more detailed maps.
2. Existing Urban Area maps are current as of 11/2/10.



Legend

- | | |
|-----------------------------------|------------------|
| River | Santa Paula |
| Lake | Simi Valley |
| National Forest | Thousand Oaks |
| 10-Digit Hydrologic Unit Boundary | Port Hueneme |
| Existing Urban Area | |
| Camarillo | Ventura |
| Fillmore | Ojai |
| Moorpark | Urban County |
| Oxnard | Non-Urban County |
| | Adjacent County |



**Hydrologic Areas
Ventura County, CA**

Geosyntec
consultants

Figure
B-1

Oakland Office

April 2010



Legend

- | | |
|---|------------------|
| BIOL Designated Waterbody | Santa Paula |
| 303(d) Listed Waterbody | Simi Valley |
| Environmentally Sensitive Habitat Areas | Thousand Oaks |
| Lake | Port Hueneme |
| National Forest | Ventura |
| Existing Urban Area | Ojai |
| Camarillo | Urban County |
| Fillmore | Non-Urban County |
| Moorpark | Adjacent County |
| Oxnard | |

10 5 0 10 Miles



Environmentally Sensitive Areas
Ventura County, CA

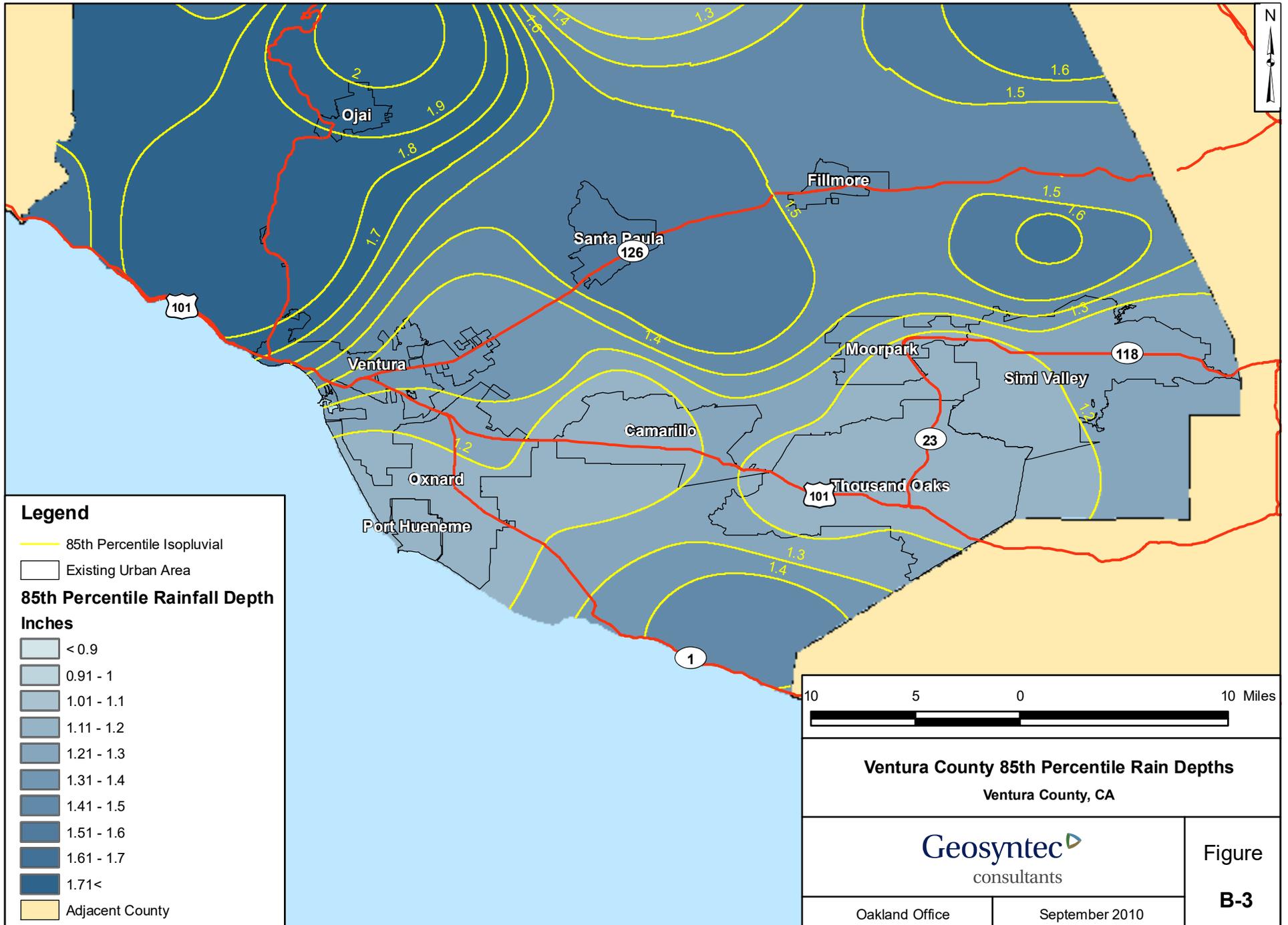
Geosyntec
consultants

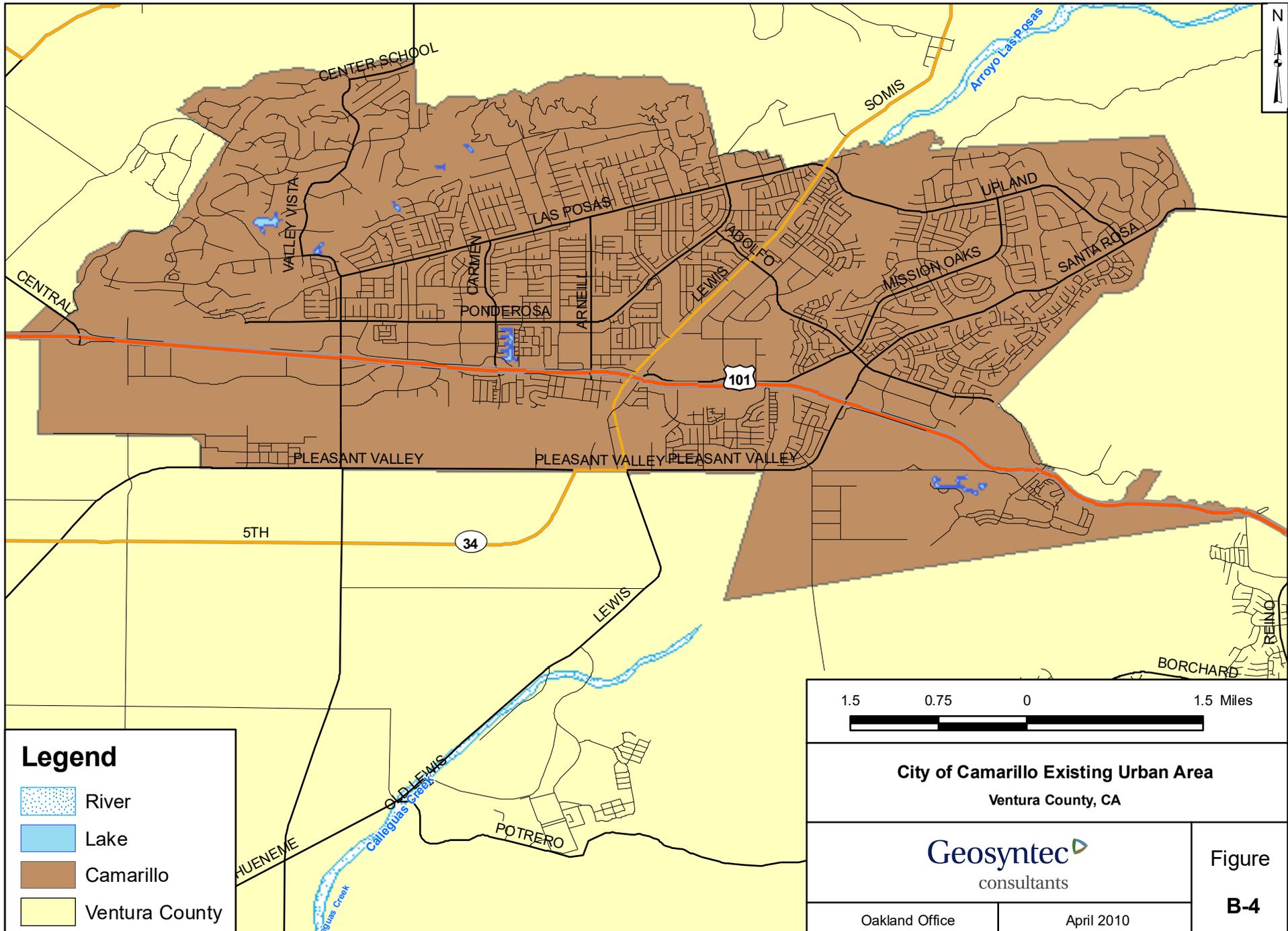
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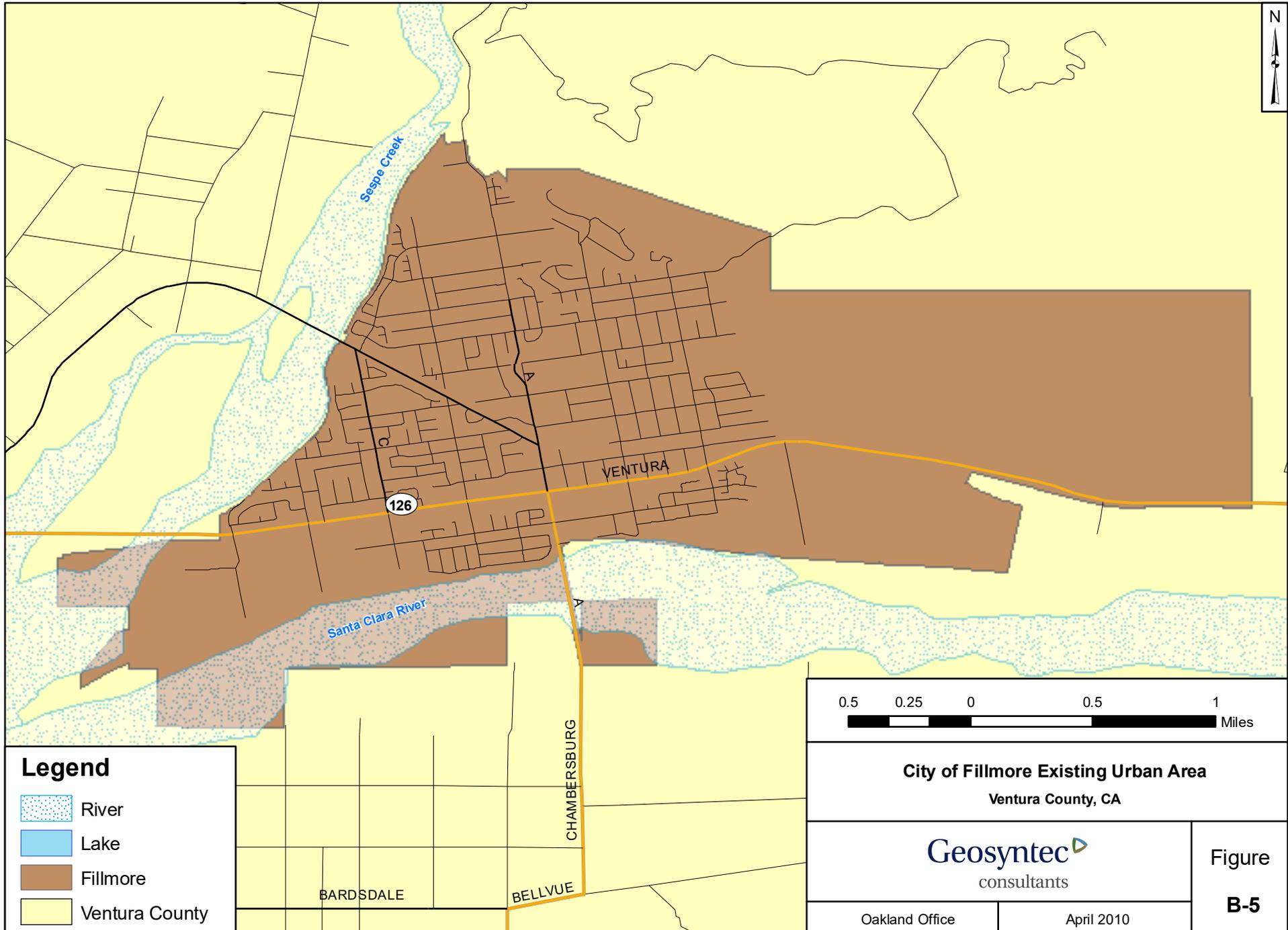
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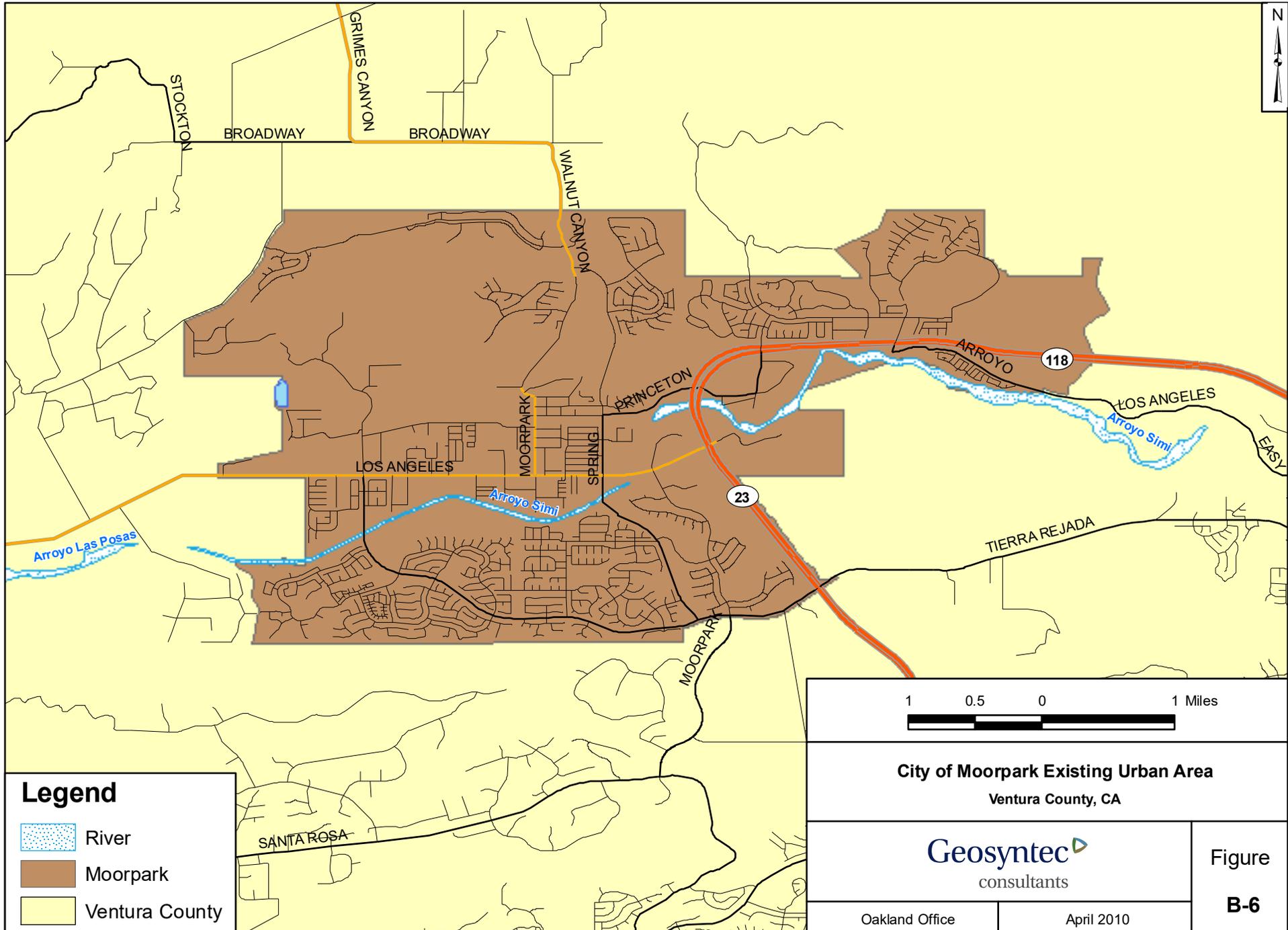
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Legend

-  River
-  Moorpark
-  Ventura County

1 0.5 0 1 Miles



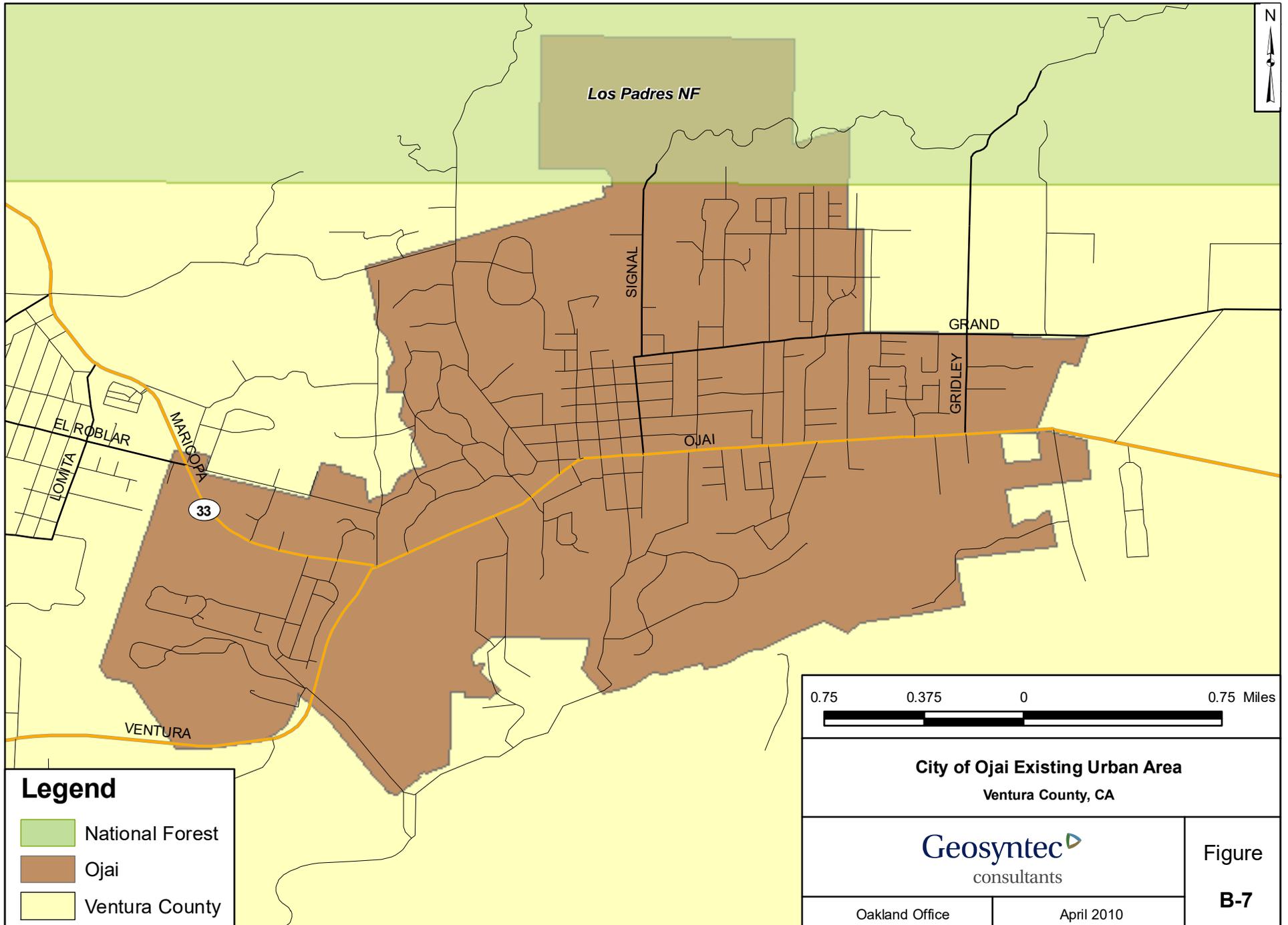
City of Moorpark Existing Urban Area
Ventura County, CA

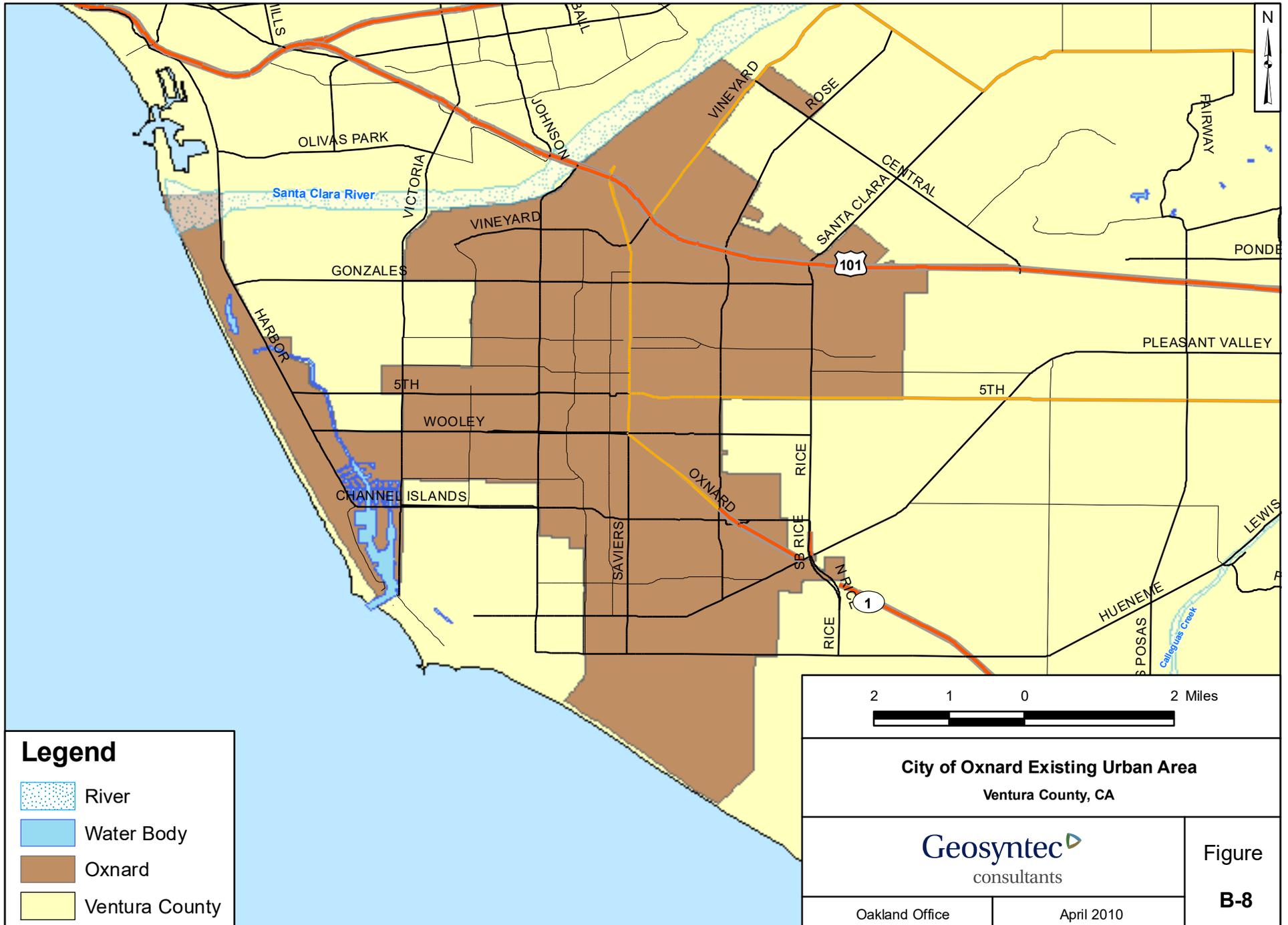
Geosyntec
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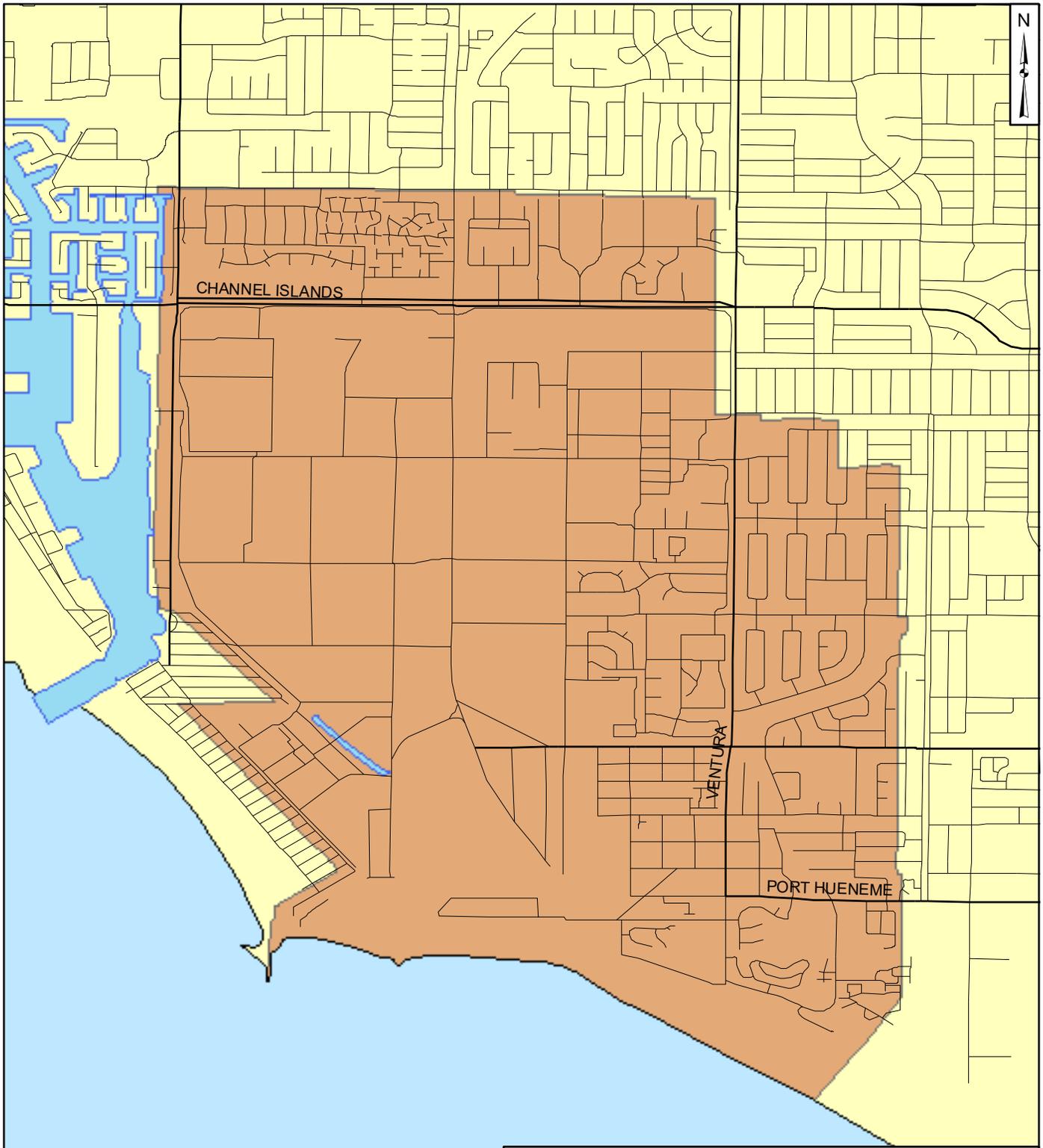
Oakland Office

April 2010

Figure
B-6







CHANNEL ISLANDS

VENTURA

PORT HUENEME



Legend

-  River
-  Water Body
-  Port Hueneme
-  Ventura County

City of Port Hueneme Existing Urban Area
Ventura County, CA

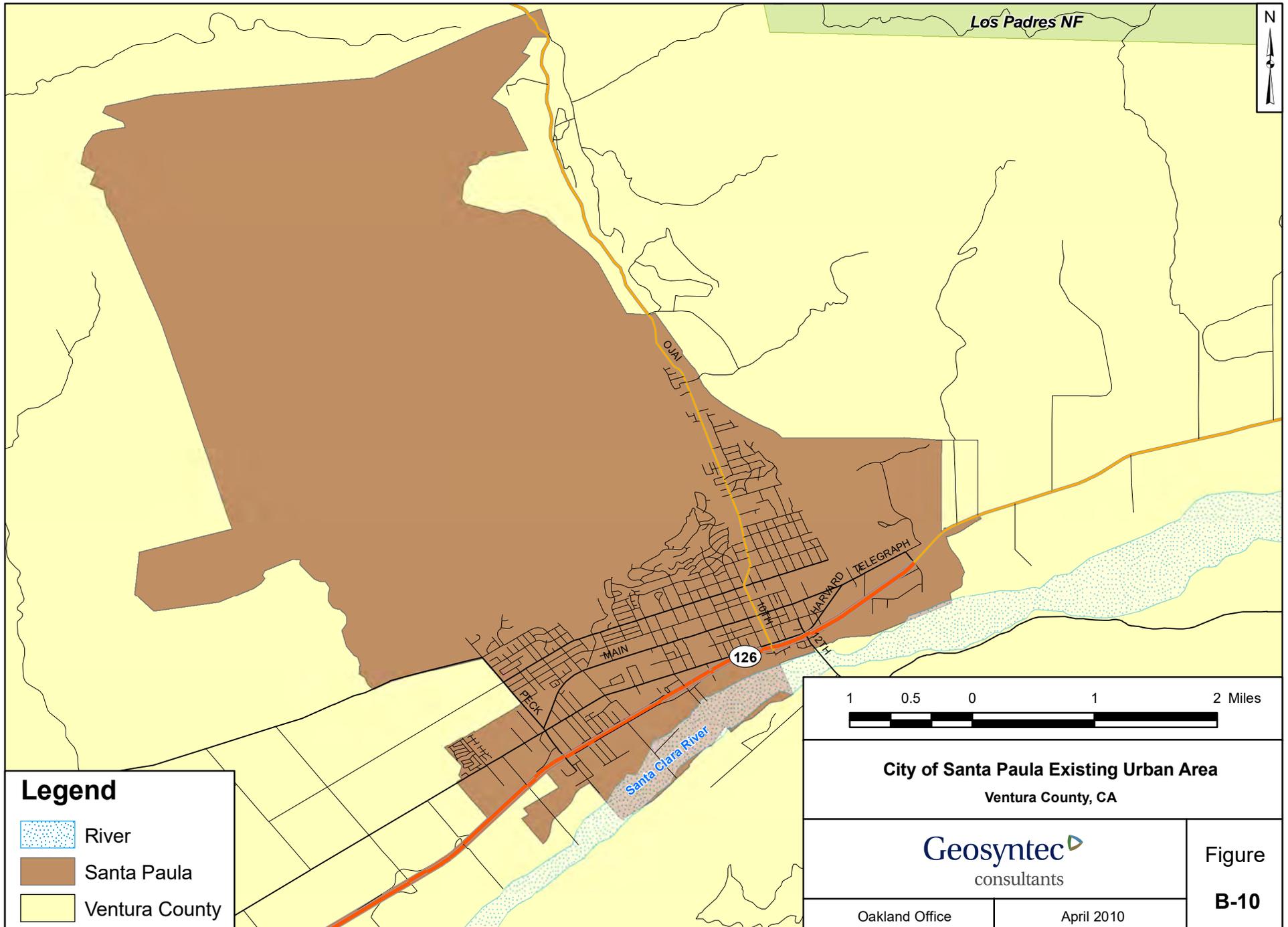
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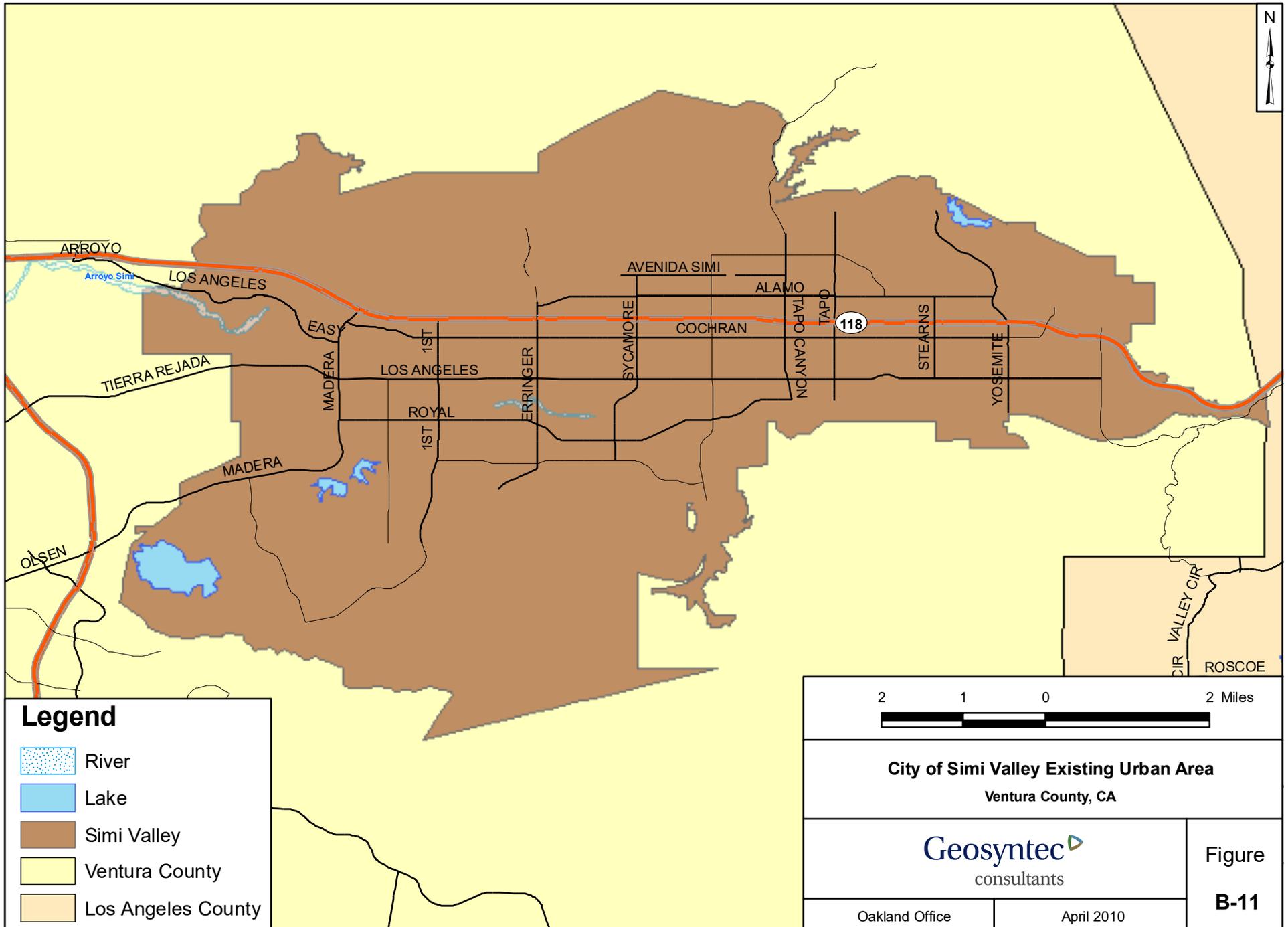
Figure

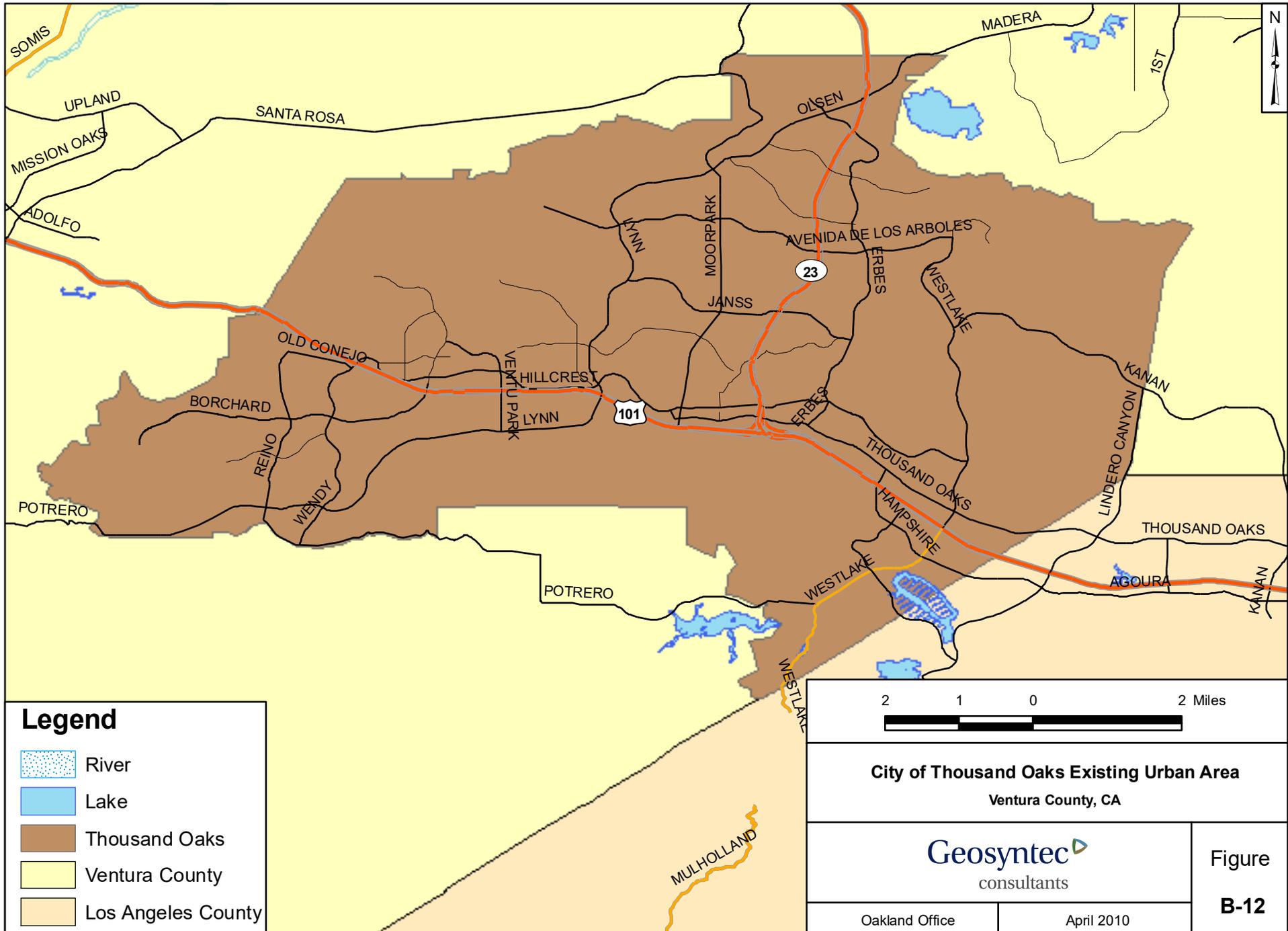
B-9

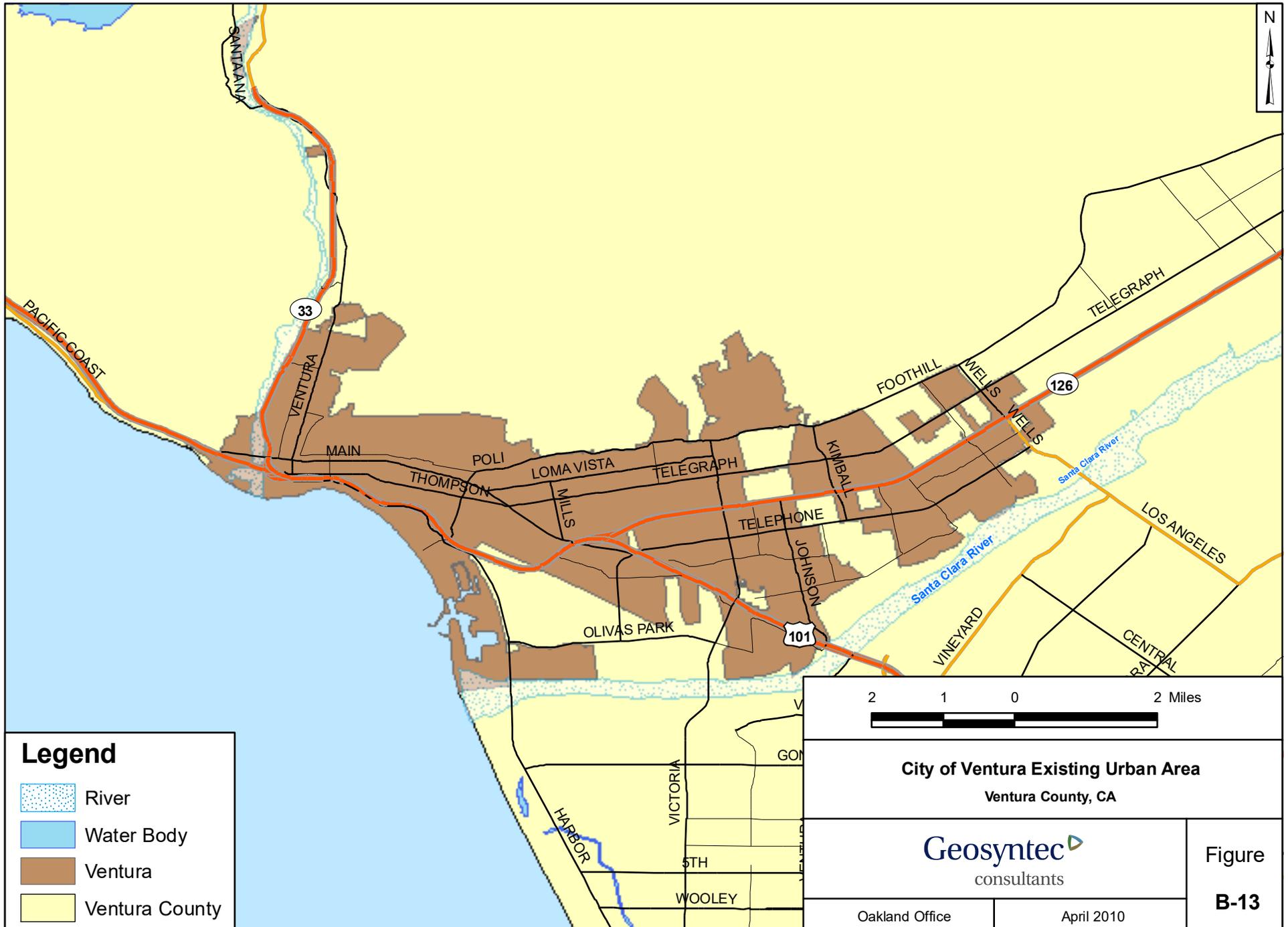
Oakland Office

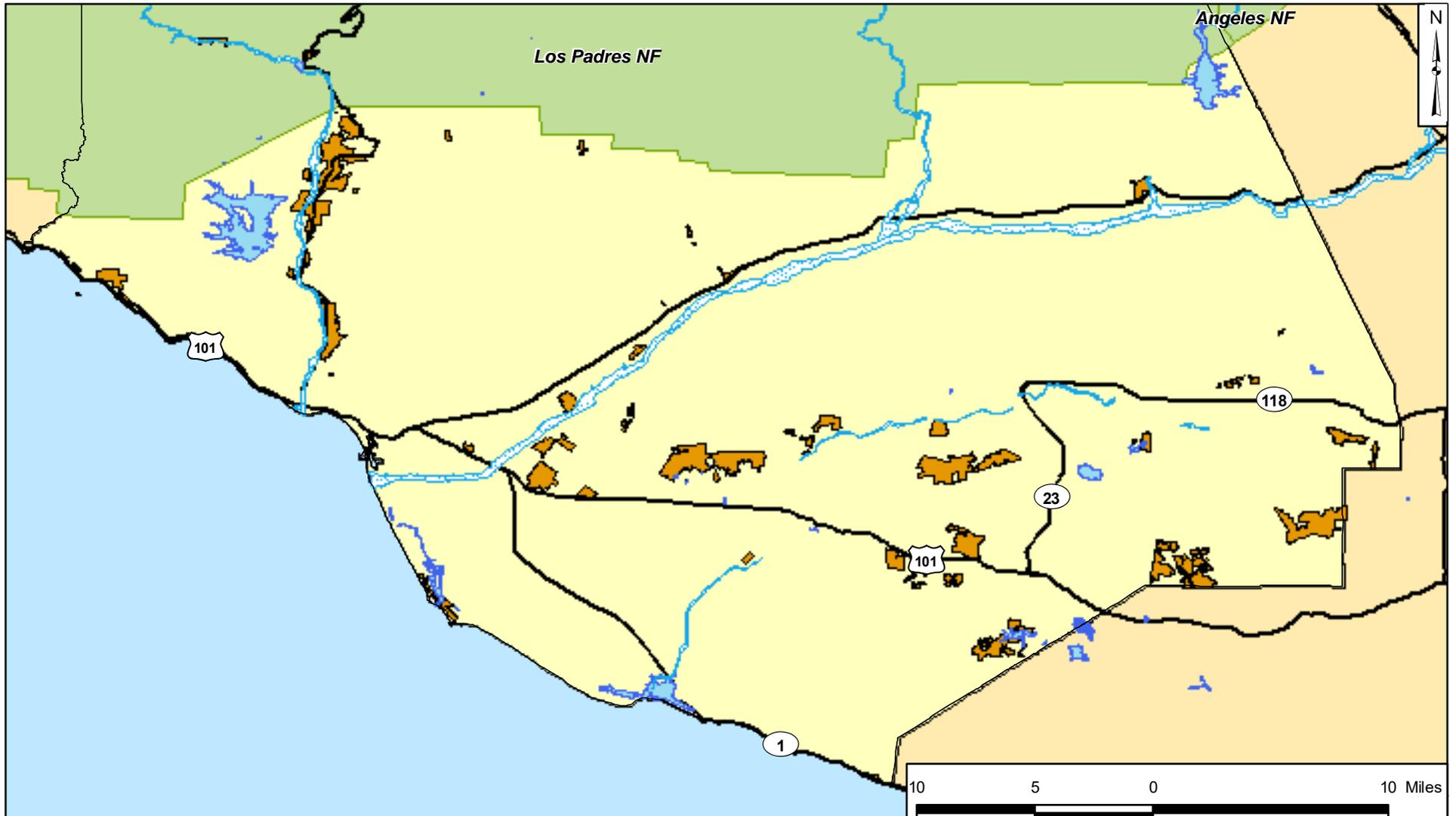
April 2010







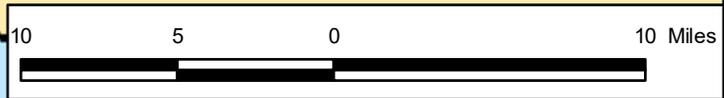




Legend

- River
- Lake
- Unincorporated Urban County
- National Forest
- Non-Urban County
- Adjacent County

Note: An Unincorporated Urban Center is an existing or planned community which is located in an Area of Interest where no city exists. The unincorporated urban center represents the focal center for community and planning activities within an Area of Interest. For example, the Community of Piru represents the focal center in the Piru Area of Interest. This map represents the existing Unincorporated Urban Centers as defined by the Ventura County General Plan.



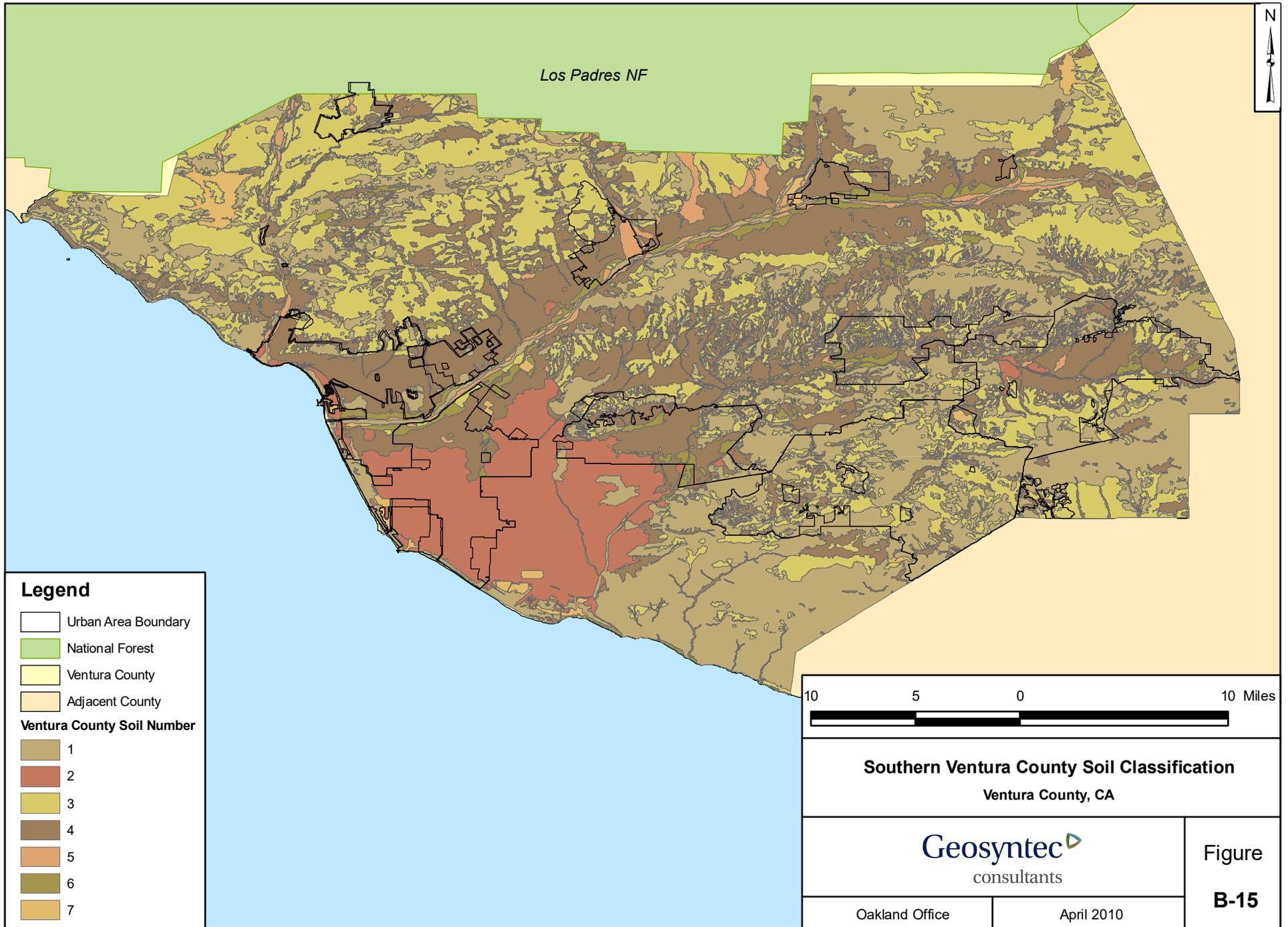
Ventura County Unincorporated Urban Areas
Ventura County, CA



Figure
B-14

Oakland Office

April 2010



Los Padres NF

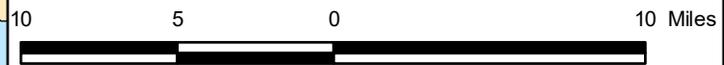


Legend

-  Urban Area Boundary
-  National Forest
-  Ventura County
-  Adjacent County

Ventura County Soil Number

-  1
-  2
-  3
-  4
-  5
-  6
-  7



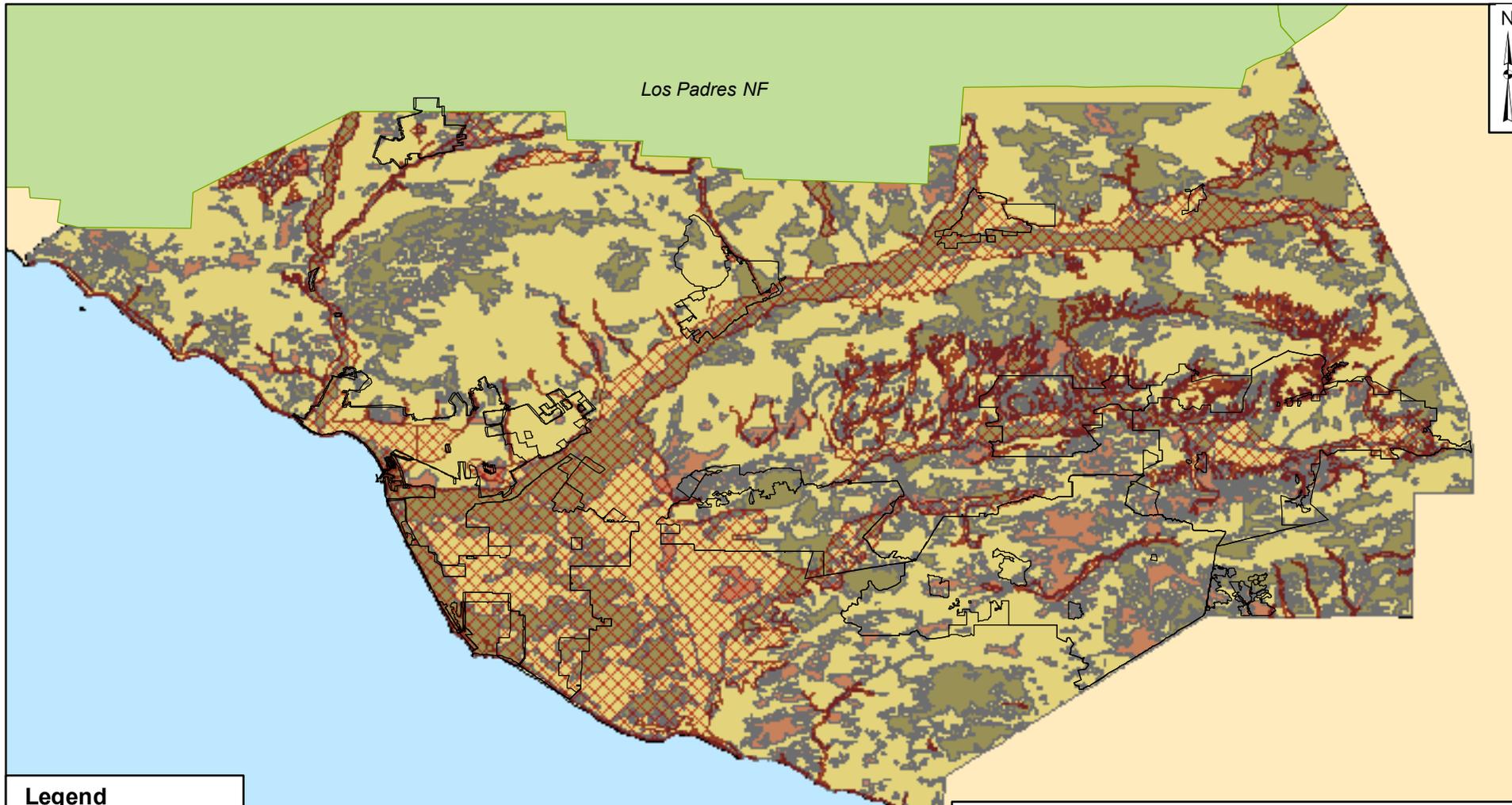
Southern Ventura County Soil Classification
Ventura County, CA

Geosyntec
consultants

Figure
B-15

Oakland Office

April 2010



Los Padres NF

Legend

-  Urban Area Boundary
-  National Forest
-  Ventura County
-  Adjacent County
-  Liquefaction Potential
- Expansive Soil Potential**
-  High
-  Medium
-  Low



**Southern Ventura County Liquefaction
and Expansive Soil Potential**
Ventura County, CA

Geosyntec
consultants

Figure
B-16

Oakland Office

April 2010

APPENDIX C: SITE SOIL TYPE AND INFILTRATION TESTING

C.1 Introduction

The purpose of site soil and infiltration testing is to more accurately determine where LID and structural treatment BMPs should be located and if infiltration is feasible on the site. The preliminary site assessment, discussed in Section 3, will likely reduce the number of test pit investigations needed by identifying candidate test sites that are most amenable to infiltration. This section summarizes the methods for conducting (1) soil test pit investigations and (2) infiltration testing at key locations identified in the preliminary site assessment that require further investigation.

A qualified soil scientist or geotechnical professional should conduct the test pit investigation and infiltration tests. The professional should be experienced with the testing procedures as well as the hydraulic functioning of the potential BMPs to ensure that additional information regarding BMP siting is acquired during the test pit investigation and infiltration tests.

This appendix is not intended to be applied as a protocol for conducting soil and infiltration testing. Instead, this section is provided to assist in specifying and standardizing soil and infiltration testing techniques across sites within Ventura County where development is occurring.

C.2 Test Pit Investigations

A test pit investigation is an integral part of assessing site soil conditions. Soil maps and hydrologic soil groups are based on regional data and provide only a general understanding of what to expect; however, there are undoubtedly unknowns that will be discovered during these initial field observations. A test pit investigation involves digging or excavating a test pit (deep hole). By excavating a test pit, overall soil conditions (both vertically and horizontally) can be observed in addition to the soil horizons. To maximize the knowledge gained during the test pit investigation, many tests and observations should be conducted during this process.

Test pits should be excavated to a depth at least three feet deeper than the proposed bottom of non-infiltration BMPs and at least eleven feet deeper than the proposed bottom of infiltration BMPs. A project that imports fill must characterize the proposed soil profile at the specified depths. For example, if the proposed depth of fill is 5 feet below grade and an infiltration BMP is to be used in the location of the fill, both the fill and the native subsoil require soil characterization. Figure C-1 illustrates the proposed soil profile that would result with 3 feet of fill. Since the test pit must be excavated to a depth that is 11 feet deeper than the bottom of the proposed infiltration BMP, a test pit investigation of the top 8 feet of native subsoil is required, in addition to the laboratory sample of the fill material. Characterization of the fill material should be conducted in a laboratory. It is recommended that soil compaction is limited in the location of a proposed infiltration BMP.

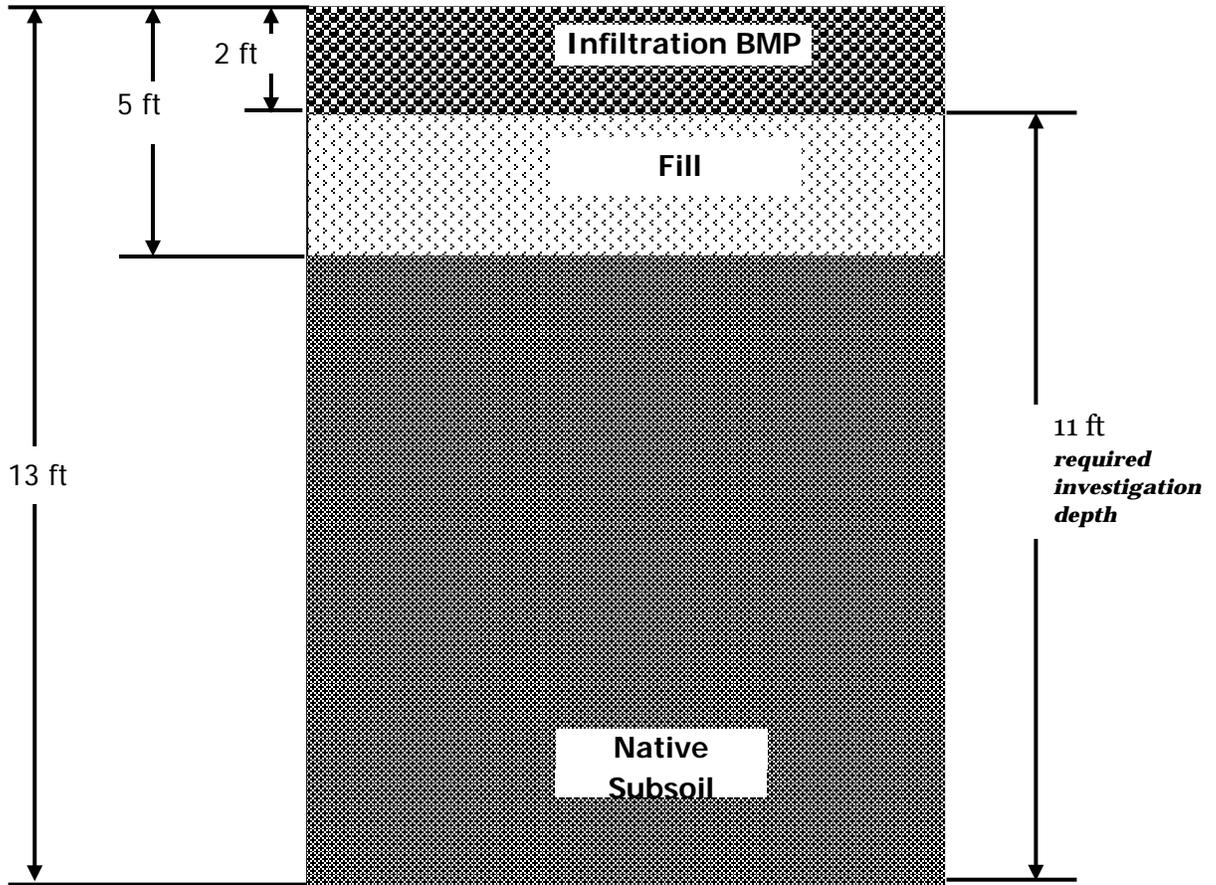


Figure C-1: Post-fill Soil Profile

As the test pit is excavated, the following measurements should be made:

Standard penetration testing to determine the relative density as it changes with depth (minimum intervals of 2 - 3 feet), and

Infiltration testing with at least one test occurring at the proposed bottom of the BMP and one test occurring at the bottom of the test pit (11 feet below the bottom of the infiltration BMP).

In addition, many observations should be made during and after the excavation of the soil pit, including:

- Elevation of groundwater table or indications of seasonally high groundwater table should be noted using the NRCS hydric soil field indicators guide (NRCS, 2003).
- Soil horizon observations, including: depths indicating upper and lower boundaries of the soil horizons, depths to limiting layers (i.e., bedrock and clay), soil textures, colors and their patterns, and estimates of the type and percent of coarse fragments.

- Locations and descriptions of macropores (i.e., pores and roots).
- Other pertinent information/observations.

The number of test pits required depends largely on the specific site and the proposed development plan. Additional tests should be conducted if local conditions indicate significant variability in soil types, geology, water table elevations, bedrock, topography, etc. Similarly, uniform site conditions may indicate that fewer test pits are required. Excessive testing and disturbance of the soil prior to construction is not recommended. When test pit investigations are complete, including infiltration testing, the pits should be refilled with the original soil and the surface replaced with the original topsoil.

C.3 Infiltration Testing

There are a variety of infiltration field test methodologies available to determine the infiltration rate of a soil. Infiltration tests should be conducted in the field in order to ensure that the measurements are representative of actual site conditions (including inherent heterogeneity). As mentioned above, usually infiltration rates should be determined at a minimum of two locations in each test pit and one must be conducted at the proposed bottom depth of the BMP. The actual number of infiltration tests required depends on the soil conditions; if the soils are highly variable, more tests may be required. To ensure groundwater is protected and that the infiltration BMP is not rendered ineffective by overload, it is important to periodically verify infiltration rates of the constructed BMP(s).

For BMPs that infiltrate water through the surface soil layer (e.g., bioretention areas, permeable pavement), choosing a method that measures infiltration in surface soils is important. For infiltration trenches and drywells, infiltration will occur at a greater depth in the soil matrix; therefore, borehole methods may be more appropriate.

Depending on the type of infiltration BMP and depth at which the infiltration test should be conducted, there are several types of infiltration tests that can be used including: disc permeameters, single and double ring infiltrometers, and borehole permeameters. Disc permeameters are typically used to provide estimates of soil near saturation but can prove to be difficult due to measures of three dimensional flow. This device is also commonly used for assessing infiltration rates of already constructed permeable pavements and is generally not used for assessing infiltration rates prior to site disturbance; therefore, the disc permeameter method will not be discussed further in this Appendix. Single and double ring infiltrometers directly measure vertical flow into the surface of the soil. Double ring infiltrometers account for lateral flow boundary affects with the addition of an outer water reservoir and are generally the preferred method for surface infiltration. Borehole permeameters are best suited to collect infiltration measurements below the soil surface. Two subsurface infiltration methods are discussed below including the Guelph and falling-head permeameters.

C.4 Double Ring Infiltrometer

The double ring infiltrometer method consists of driving two cylinders, one inside the other, into the ground and partially filling them with water and maintaining the liquid at a constant level (ASTM D3385-94). The volume of water added to the inner ring from a separate water reservoir, to maintain the constant head level is comparable to the volume of water infiltrating into the soil. The volume of water added to the inner ring divided by the time period for which the water was added is equal to the infiltration rate. A photograph of a common double ring infiltrometer is provided in Figure C-2.



Figure C-2: Double Ring Infiltrometer

Photo Credit: Geosyntec Consultants (Braga and Fitsik, 2008)

C.5 Borehole Guelph Infiltration Test

For shallow boreholes, the Guelph Permeameter has been developed as a field portable kit. This permeameter consists of a tube that is placed in a hand-drilled shallow borehole and water is provided to the tube through a separate reservoir. Water loss in the reservoir is used to estimate the hydraulic conductivity of the soil, which may be used to calculate infiltration based on various standard models (Soil Moisture Equipment, 2005). A photograph of a Guelph Permeameter is provided in Figure C-3. It is important to remember that this method will include vertical and lateral water flow from the borehole.



Figure C-3: Guelph Permeameter for Shallow Borehole Permeability

Photo Credit: USDA, 2005

C.6 Falling-Head Borehole Infiltration Test

The falling-head borehole infiltration test is commonly applied to assess infiltration at greater depths (e.g. 5 - 25 ft). The method is generally performed according to United States Bureau of Reclamation procedure 7300-89 (USBR, 1990). Caltrans has used the method to site stormwater infiltration structures (Caltrans, 2003). Essentially the method consists of boreholes, installing well casing with slots cut to release water at the target depths, backfilling the borehole, adding pre-soak water, and then filling again with water and recording the stage loss. An example diagram is shown in Figure C-4.

The testing procedures are summarized as follows:

- 1) Remove any smeared soil surfaces to provide a natural soil interface for testing the percolation of water. Remove all loose material. The U.S. EPA recommends scratching the sides with a sharp pointed instrument. (Note: upon tester's discretion, a 2-inch layer of coarse sand or fine gravel may be placed to protect the bottom from scouring and sediment.) Fill casing with clean water and allow to pre-soak for 24 hours or until the water has completely infiltrated.
- 2) Refill casing and monitor water level (distance from top of casing to top of water) for 1 hour. Repeat this procedure a total of four times. (Note: upon tester's discretion, the final field rate may either be the average of the four observations

or the value of the last observation. The final rate shall be reported in inches per hour.)

- 3) Testing may be done through a boring or open excavation.
- 4) The location of the test must be near the proposed facility.
- 5) Upon completion of the testing, the casings shall be immediately pulled and the test pit shall be back-filled.

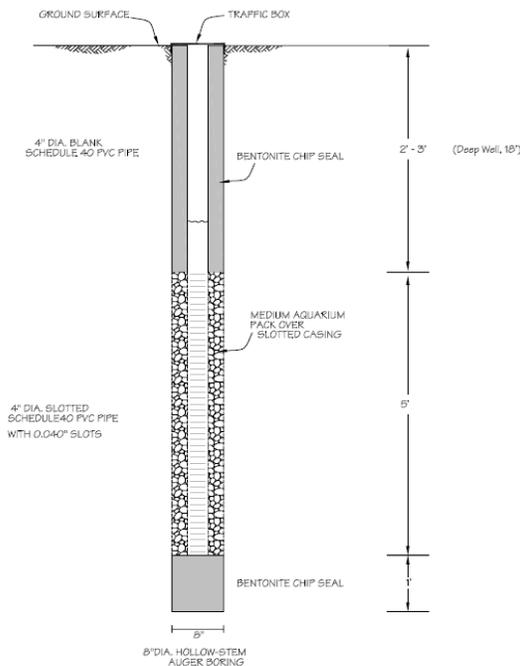


Figure C-4: Falling-Head Permeameter for Deep Borehole Permeability

Diagram Credit: Group Delta Consultants, 2008

C.7 Laboratory Soil Tests

If fill materials imported from off-site are part of an infiltration BMP design, a laboratory test is required to determine the infiltration rate of the fill soil. A sample of the fill soil from each area where a BMP will be located must be tested. The soil sample must be compacted to the same degree that will be present after final grading. Once prepared, the sample should be sent to a specialty laboratory to conduct a test of the infiltration rate. These results may then be used to assess the applicability of a specific BMP.

C.8 Assessment of Test Results

The results from field infiltration methods should be examined to consider data variability and sample distribution to determine if there has been adequate sampling. If the spatial variability (heterogeneity) is large, then additional field measurements may be necessary. The infiltration results should be compared to the information gathered on site soils and geology to see if they are consistent. The results of the site soils and infiltration testing may then be used in the siting, selection, sizing, and design of LID site design techniques and structural treatment BMPs.

C.9 References

- ASTM D 3385-94, 2003. "Standard Test Method for Infiltration Rate of Soils Field Using Double-Ring Infiltrometer." American Society for Testing Materials, Conshohocken, PA. 10 Jun, 2003.
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APPENDIX D : BMP PERFORMANCE GUIDANCE

D.1 Permit Requirement

Part 3, Section A.3 of [Order R4-2010-0108](#) states the following:

3. *Each Permittee shall require that treatment control BMPs being implemented under the provisions of this Order shall be designed, at a minimum, to achieve the BMP performance criteria for storm water pollutants likely to be discharged as identified in Attachment “C”, for an 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998). Expected BMP pollutant removal performance for effluent quality was developed from the WERF-ASCE/ U.S. EPA International BMP Database. Permittees shall select Treatment BMPs based on the primary class of pollutants likely to be discharged from the site/facility (e.g. metals from an auto repair shop). Permittees may develop guidance for appropriate Treatment BMPs for project type based on Attachment “C”. For the treatment of pollutants causing impairments within the drainage of the impaired waterbody, permittees shall select BMPs from the top three performing BMP categories or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP for the pollutant causing impairment.*

Attachment C contains the following table:

Effluent Concentrations as Median Values

BMP Category	Total Suspended Solids (mg/L)	Total Nitrate-Nitrogen (mg/L)	Total Copper (µg/L)	Total Lead (µg/L)	Total Zinc (µg/L)
Detention Pond	27	0.48	15.9	14.6	58.7
Wet Pond	10	0.2	5.8	3.4	21.6
Wetland Basin	13	0.13	3.3	2.5	29.2
Biofilter	18	0.36	9.6	5.4	27.9
Media Filter	11	0.66	7.6	2.6	32.2
Hydrodynamic Device	23	0.29	11.8	5	75.1

Expected BMP pollutant performance for effluent quality was developed from the WERF-ASCE/U.S. EPA International BMP Database, 2007

D.2 Using Performance Statistics for BMP Selection

The observed performance of stormwater BMPs provides valuable quantitative information that can be used to infer the potential water quality benefits of stormwater BMP implementation. However, water quality data sets and the statistical methods used to summarize them inherently contain a high level of uncertainty. Consideration of this uncertainty is fundamental to the proper and responsible use of statistics. Some of the key issues that should be considered when

drawing conclusions from data contained in the [ASCE International BMP Database](#) for the purposes of developing BMP selection guidance are discussed below.

Number of Representative BMPs

Some BMP types are not well represented in the [ASCE International BMP Database](#) due to small data sets. For example, the “Wetland Basin” category only included nine studies nationwide as compared to over 50 for biofilters at the time the data analysis was conducted for the MS4 permit (2007). For some pollutants, such as total copper, data are only available for four Wetland Basin studies. While the BMP Database continues to grow, there are currently less than 300 BMP studies included, with only approximately 50 in California. The size of the data set provides an indicator of the reliability of that data in representing the “typical” effluent concentration for that BMP type.

BMP Categorization

The BMP studies within the BMP database represent a wide spectrum of BMP types with a variety of designs and sizing criteria. While some guidance is provided on how to categorize BMPs, data providers are responsible for categorizing their own BMPs. Some of these BMPs could be poorly categorized due to a variety of reasons, such as differences in terminology, missing or inadequately sized treatment components (e.g., forebays, vegetation, or permanent pools) or variable treatment function (e.g., a seasonal wet pond). Ideally, the BMPs should be grouped according to common design components and/or sizing criteria, but there currently aren’t enough data with design information to support such analyses. However, the BMP Database is currently undergoing a restructuring that is redefining or sub-categorizing the current BMP categories within the database.

Statistical Significant Difference between BMP Influent/Effluent

Some of the median effluent values reported in the BMP Database are not statistically different than the median influent values (i.e., no concentration reductions on average). No significant difference may indicate either low influent concentrations or poor performing BMPs for that pollutant. In either case, the effluent value alone would not be a reliable indicator of BMP performance. For example, as summarized in Geosyntec and Wright Water (2008), the data for Wetland Basins, a “top performing” BMP according to Attachment C of the MS4 permit, did not conclusively show statistically significant removals of TSS, nitrate-nitrogen, or total lead. Data for hydrodynamic separators and media filters indicate they are also ineffective at reducing nitrate-nitrogen concentrations.

Statistical Significant Differences in Effluent between BMP Types

The median effluent concentrations of the various BMP types are not necessarily statistically significantly different from each other. Statistical significance can be determined by analyzing whether the 95th percent confidence intervals overlap. The

number of data points and the variability of those data points determine the confidence interval of each median value. If the effluent medians are not statistically significantly different from each other, it may not be possible to determine the “top three” performing BMPs as specified in the MS4 Permit. Confidence intervals about the median effluent concentrations for each BMP type are provided in Geosyntec and Wright Water (2008) (see attached).

D.3 Comparison of the Performance of Biofiltration BMPs and Retention BMPs

Background

Projects that demonstrate technical infeasibility for reducing EIA to $\leq 5\%$ using Retention BMPs are eligible to use Biofiltration BMPs to achieve the EIA performance standard. Section 4.E.III.1.(b) of [Order R4-2010-0108](#) states:

If on-site retention is determined to be technically infeasible pursuant to 4.E.III.2(b), an on-site biofiltration system that achieves equivalent stormwater volume and pollutant load reduction as would have been achieved by on-site retention shall satisfy the EIA limitation.

Volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs. The remaining EIA requirement may also be satisfied with flow-based Biofiltration BMPs. Flow-based Biofiltration BMPs shall be sized for the remaining drainage area from which runoff must be retained (A_{Retain}) with a rainfall intensity that varies with time of concentration for the catchment tributary to the flow-based Biofiltration BMP, according to the following. Using this flow-based sizing method will achieve or exceed capture and treatment of 80% of the average annual runoff volume.

<u>Time of Concentration, minutes</u>	<u>Design Intensity for 150% Sizing, in/hr</u>
30	0.24
20	0.25
15	0.28
10	0.31
5	0.35

Methodology

A planning-level analysis was conducted to assess whether the range of Biofiltration BMPs included in the 2010 TGM, sized per these volume- or flow-based sizing criteria, would achieve equivalent pollutant load reduction to Retention BMPs. The following describes the step-wise method taken for the analysis.

Step 1: Estimate the Catchment Annual Load

Assumptions:

- Average Annual Rainfall- 14.5 inches (Oxnard Gauge) (precipitation, P)
- One acre Catchment (area, A)

Calculations:

1) Determine developed runoff coefficients for single-family, multi-family, commercial, and industrial land use types

- Use average imperviousness values from Ventura Hydrology Manual (Exhibit 14B)
- Assume soil group 2/3 (Group C soils) for pervious runoff coefficient (C_p, conservative value = 0.1)
- Use developed runoff coefficient (C_d) equation from hydrology manual:

$$C_d = 0.95 * (\text{imperviousness}) + (C_p) * (1 - \text{imperviousness})$$

2) Calculate Average Annual Runoff Volume (cu-ft) using:

$$V_{\text{avg annual}} = C_d * (P/12) * A * 43560$$

3) Multiply average annual runoff volume by respective event mean concentrations (EMCs) for pollutants of concern to get average annual loads.

- Look at “EMC Arithmetic Means” to see EMCs by land use type.
- EMCs calculated based on LA County Land Use specific data (LACDPW, 2000). Descriptive statistics estimated using the parametric bootstrap method suggested by Singh, Singh, and Engelhardt (1997).
- Pollutants of concern: Total Suspended Solids (TSS), Total Copper, Total Zinc, and Total Nitrogen. TSS is representative of the sediment pollutant class as well as pollutants that are associated with particulates (e.g., total phosphorous, some metals, pesticides, some organics). Copper and zinc represent metals – lead has been removed from the environment using True Source Control (removal of lead from gasoline) and thus is not an important POC for Biofiltration BMP selection and design. Total nitrogen is representative in that it includes all of the species of nitrogen (organic nitrogen, ammonia, nitrate, and nitrite) and instead of focusing on one species (nitrate).

Step 2: Estimate Retention BMP Load Reduction

1) Determine Retention BMP Design volume:

- Design storm = 0.75”
 - Use land use-based coefficients
 - $V_{\text{design}} = C_d \cdot (0.75/12) \cdot A \cdot 43560$
- 2) Determine Retention BMP capture volume using CASQA 48-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)
- Calculate Unit Basin Storage Volume using:
 - Unit Basin Storage Vol = V_{design} / A
 - Using developed runoff coefficients, interpolate between runoff coefficient lines to determine the percentage of total runoff captured by Retention BMP.
- 3) Determine Annual Load Reduction
- The percentage of the annual load that is reduced is the same as the percentage of runoff captured by the Retention BMP, assuming that all captured runoff is retained. The percent capture calculated in (2) can be multiplied by the catchment annual pollutant load to obtain the load reduction.

Step 3: Estimate Biofiltration BMP Load Reduction

- 1) Determine BMP Design volume as described in 2.a above, except:
- Design storm = $1.5 \cdot 0.75 = 1.125$ inches
- 2) Determine BMP capture volume using CASQA 24-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003) as described in 2.b. above
- 3) Determine annual load reduction. Load reduction in Biofiltration BMPs can occur via two pathways: incidental infiltration and treatment.
- Incidental infiltration in Biofiltration BMPs was discussed in a publication by Strecker, Quigley, Urbonas, and Jones (Strecker et al, 2004). That study observed as much as 40% volume reduction through incidental infiltration. A recent summary of the studies in the ASCE BMP Database found the following average volume reductions: filter strips, 38%; vegetated swales, 48%; and bioretention with underdrain, 61% (Geosyntec, 2011; attached to this appendix).
 - Pollutant Load reduction via incidental infiltration can be calculated as follows (20% is the percent of the captured volume assumed to be reduced via incidental infiltration for this discussion):

$$\text{Load reduced} = \text{Average annual Load} * \text{Percent Runoff Captured by BMP} * 20\%$$

- Load reduction through treatment calculated based on published literature on pollutant removals from biofiltration facilities.
- Load reduction through treatment is calculated as follows:

$$\text{Load reduced} = \text{Average annual Load} * \text{Percent Runoff Captured by BMP} * 80\% * \text{Assumed Average Percent Removal}$$

Note: 80% = 100%-20%, i.e. the captured runoff that was not infiltrated via incidental infiltration

Constituent	Range of Reported Removal Efficiencies from Literature ¹	Selected Removal Efficiency for Effectiveness Evaluation ²	Selected Removal Efficiency for Enhanced Nitrogen Removal ³
TSS	54-89	79	79
Total Zinc	48-96	77	77
Total Copper	33-92	72	72
Total Nitrogen	21-54	25	50

¹ Range of values from literature cited below:

1. Herrera Consultants and Geosyntec Consultants, 2010. Filterra® Bioretention Systems: Technical Basis for High Flow Rate Treatment and Evaluation of Stormwater Quality Performance. September 2010.
2. University of New Hampshire, 2009. University of New Hampshire Stormwater Center 2009 Biannual Report. www.unh.edu/erg/cstev.
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4. Brown, R.A., Hunt, W.F., and Kennedy, S.G., 2009. Designing Bioretention with an Internal Water Storage (IWS) Layer. Online at: <http://www.bae.ncsu.edu/stormwater/PublicationFiles/IWS.BRC.2009.pdf>.
5. Facility for Advancing Water Biofiltration. Online at: <http://www.monash.edu.au/fawb/products/obtain.html>.
6. Geosyntec Consultants and Wright Water Engineers, Inc., 2008. Overview of Performance by BMP Category and Common Pollutant Type, International Stormwater BMP Database Update. June 2008
7. Geosyntec Consultants and Wright Water Engineers, Inc., 2010. Categorical Summary of BMP Performance for Nutrient Concentration Data Contained in the International Stormwater BMP Database. December, 2010

² Removal efficiency for TSS, Total Zinc, and Total Copper represent average of values from literature. Removal efficiency for TN is that expected from a 'standard biofilter', that is, one not designed for enhanced nitrogen removal

³ Removal efficiency for TN represented as average value of removals from bioretention systems with an anaerobic zone for enhanced removal of nitrogen

- The total load reduction is calculated as the sum of the reductions from these two pathways. The percent load reduction is calculated by dividing the total load reduction by the annual pollutant load from the catchment

Step 4: Comparison of Annual Load Reductions

- 1) Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the ‘deficit’ load reduction.

Results

Step 1: Estimate the Catchment Annual Load

- 1) Determine developed runoff coefficients for single-family, multi-family, commercial, and industrial land use types

Land Use	Imperviousness	Runoff Coefficient (C)
Single Family Residential	0.3	0.36
Multi Family Residential	0.69	0.69
Commercial	0.85	0.82
Industrial	0.93	0.89

- 2) Calculate Average Annual Runoff Volume (cu-ft), and
- 3) Multiply average annual runoff volume by respective event mean concentrations (EMCs) for pollutants of concern to get average annual loads.

Land Use	Arithmetic Means from Lognormal EMC Statistics			
	TSS (mg/L)	Total Zinc (mg/L)	Total Copper (mg/L)	Total Nitrogen (mg/L as N)
Single Family Residential	124.2	71.9	18.7	3.74
Multi Family Residential	39.9	125.1	12.1	3.31
Commercial	67	237.1	31.4	3.99
Industrial	219.2	537.4	34.5	3.74

Land Use	Average Annual Runoff Volume (cu-ft)	Catchment Pollutant Loads (kg/yr)			
		TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	18,685	65,716	38	10	1,979
Multi Family Residential	36,134	40,826	128	12	3,387
Commercial	43,292	82,135	291	38	4,891
Industrial	46,871	290,933	713	46	4,964

Step 2: Estimate Retention BMP Load Reduction

- 1) Determine Retention BMP Design volume

Land Use	Design Volume (cu-ft)
Single Family Residential	967
Multi Family Residential	1869
Commercial	2239
Industrial	2424

- 2) Determine Retention BMP capture volume using CASQA 48-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)

Land Use	Design Volume (cu-ft)	Unit Basin Storage Volume (inches)	Approx % Capture
Single Family Residential	966	0.27	60.0%
Multi Family Residential	1,869	0.51	62.5%
Commercial	2,239	0.62	62.5%
Industrial	2,424	0.67	60.0%

- 3) Determine Annual Load Reduction

Land Use	Average Annual Pollutant Load Reduction (kg/yr) = Influent * Approx % Cap			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	39,429	23	5.9	1,187
Multi Family Residential	25,516	80	7.7	2,117
Commercial	51,335	182	24.1	3,057
Industrial	174,560	428	27.5	2,978

Land Use	Percent of Total Annual Loads			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	60.0%	60.0%	60.0%	60.0%
Multi Family Residential	62.5%	62.5%	62.5%	62.5%
Commercial	62.5%	62.5%	62.5%	62.5%
Industrial	60.0%	60.0%	60.0%	60.0%

Step 3: Estimate Biofiltration BMP Load Reduction

- 1) Determine Biofiltration BMP Design volume

Land Use	Design Volume (cu-ft)
Single Family Residential	1,450
Multi Family Residential	2,803
Commercial	3,359
Industrial	3,637

- 2) Determine BMP capture volume using CASQA 24-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)

Land Use	Design Volume (cu-ft)	Unit Basin Storage Volume (inches)	Approx % Capture
Single Family Residential	1,450	0.40	87.50%
Multi Family Residential	2,803	0.77	87.50%
Commercial	3,359	0.93	90.00%
Industrial	3,637	1.00	87.50%

- 3) Determine annual load reduction. Load reduction in Biofiltration BMPs can occur via two pathways: incidental infiltration and treatment.

Incidental Infiltration Scenario #1: 20% Volume Reduction

Land Use	Pollutant Load Reduction from 20% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	11,500	7	2	346
Multi Family Residential	7,144	22	2	593
Commercial	14,784	52	7	880
Industrial	50,913	125	8	869

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr) ¹
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	36,341	21	5	346	693
Multi Family Residential	22,577	69	6	593	1,185
Commercial	46,719	161	20	880	1,761
Industrial	160,886	384	23	869	1,737

¹ Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (20%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (20%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	47,841	27	6.7	693	1,039
Multi Family Residential	29,721	91	8.4	1,185	1,778
Commercial	61,503	213	26.8	1,761	2,641
Industrial	211,799	509	31.0	1,737	2,606

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (20%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (20%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	72.8%	71.4%	67.7%	35.0%	52.5%
Multi Family Residential	72.8%	71.4%	67.7%	35.0%	52.5%
Commercial	74.9%	73.4%	69.6%	36.0%	54.0%
Industrial	72.8%	71.4%	67.7%	35.0%	52.5%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the ‘deficit’ load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (20%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (20%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-8,412	-4	-0.8	495	148
Multi Family Residential	-4,205	-11	-0.6	931	339
Commercial	-10,168	-32	-2.7	1,296	416
Industrial	-37,239	-81	-3.5	1,241	372

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (20%) (%)				Enhanced Nitrogen + Incidental Infiltration (20%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-12.8%	-11.4%	-7.7%	25.0%	7.5%
Multi Family Residential	-10.3%	-8.9%	-5.2%	27.5%	10.0%
Commercial	-12.4%	-10.9%	-7.1%	26.5%	8.5%
Industrial	-12.8%	-11.4%	-7.7%	25.0%	7.5%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 20% of the average annual runoff volume, which is a conservative estimate of incidental infiltration for all types of Biofiltration Treatment Measures, provide equivalent pollutant load reduction to Retention BMPs for TSS and metals.

Incidental Infiltration Scenario #2: 40% Volume Reduction

Land Use	Pollutant Load Reduction from 40% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	23,000	13	3	693
Multi Family Residential	14,289	45	4	1,185
Commercial	29,569	105	14	1,761
Industrial	101,827	250	16	1,737

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr) ¹
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	27,256	15	3.7	260	519
Multi Family Residential	16,932	52	4.7	445	889
Commercial	35,039	121	14.9	660	1,321
Industrial	120,665	288	17.2	652	1,303

¹ Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (40%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (40%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	50,256	29	7.2	952	1,212
Multi Family Residential	31,221	97	9.0	1,630	2,074
Commercial	64,608	225	28.8	2,421	3,082
Industrial	222,491	538	33.3	2,389	3,040

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (40%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (40%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	76.5%	75.4%	72.6%	48.1%	61.3%
Multi Family Residential	76.5%	75.4%	72.6%	48.1%	61.3%
Commercial	78.7%	77.6%	74.7%	49.5%	63.0%
Industrial	76.5%	75.4%	72.6%	48.1%	61.3%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the ‘deficit’ load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (40%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (40%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-10,827	-6	-1.2	235	-25
Multi Family Residential	-5,705	-17	-1.3	487	42
Commercial	-13,273	-44	-4.7	636	-24
Industrial	-47,931	-110	-5.8	589	-62

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (40%) (%)				Enhanced Nitrogen + Incidental Infiltration (40%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-16.5%	-15.4%	-12.6%	11.9%	-1.3%
Multi Family Residential	-14.0%	-12.9%	-10.1%	14.4%	1.2%
Commercial	-16.2%	-15.1%	-12.2%	13.0%	-0.5%
Industrial	-16.5%	-15.4%	-12.6%	11.9%	-1.3%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 40% of the average annual runoff volume, which is representative of vegetated swales and filter strips, provide equivalent pollutant load reduction to Retention BMPs for all of the pollutants of concern.

Incidental Infiltration Scenario #3: 60% Volume Reduction

Land Use	Pollutant Load Reduction from 60% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	34,501	20	5	1,039
Multi Family Residential	21,433	67	6	1,778
Commercial	44,353	157	21	2,641
Industrial	152,740	374	24	2,606

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr) ¹
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	18,170	10	2	173	346
Multi Family Residential	11,288	34	3	296	593
Commercial	23,359	81	10	440	880
Industrial	80,443	192	11	434	869

¹ Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (60%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (60%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	52,671	30	7.7	1,212	1,385
Multi Family Residential	32,722	102	9.6	2,074	2,371
Commercial	67,712	238	30.7	3,082	3,522
Industrial	233,183	567	35.5	3,040	3,475

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (60%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (60%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	80.2%	79.5%	77.6%	61.3%	70.0%
Multi Family Residential	80.2%	79.5%	77.6%	61.3%	70.0%
Commercial	82.4%	81.7%	79.8%	63.0%	72.0%
Industrial	80.2%	79.5%	77.6%	61.3%	70.0%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the ‘deficit’ load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (60%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (60%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-13,242	-7	-1.7	-25	-198
Multi Family Residential	-7,206	-22	-1.9	42	-254
Commercial	-16,378	-56	-6.7	-24	-465
Industrial	-58,623	-139	-8.1	-62	-496

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (60%) (%)				Enhanced Nitrogen + Incidental Infiltration (60%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-20.2%	-19.5%	-17.6%	-1.3%	-10.0%
Multi Family Residential	-17.7%	-17.0%	-15.1%	1.2%	-7.5%
Commercial	-19.9%	-19.2%	-17.3%	-0.5%	-9.5%
Industrial	-20.2%	-19.5%	-17.6%	-1.3%	-10.0%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 60% of the average annual runoff volume, which is representative of bioretention with an underdrain, is equivalent to or exceeds the pollutant load reduction of Retention BMPs for all of the pollutants of concern.

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APPENDIX E : BMP SIZING WORKSHEETS

E.1 Structural Treatment BMP Sizing Criteria

The BMP sizing criteria for determining the design volume or design flow for a proposed BMP are discussed in this appendix. These criteria must be used for all stormwater BMPs installed in new and re-development projects in Ventura County. This section outlines the rainfall analyses, Ventura County MS4 Permit sizing criteria, and recommended sizing methods for both volumetric and flow-based analysis.

Sizing Criteria

The type of rainfall analysis required depends on whether the BMP is a volume-based or flow-based BMP. This distinction between volume-based and flow-based controls is not always clear, especially in a sequence of BMPs or a treatment train. The following are general guidelines for each type of control.

- Volume-based BMPs are designed to treat a volume of runoff, which is detained for a certain period of time to allow for the settling of solids and associated pollutants. Volume-based BMPs included in this manual are bioretention, planter boxes, infiltration systems, and retention/detention BMPs.
- Flow-based BMPs treat water on a continuous flow basis. Flow-based BMPs included in this manual are vegetated swales, filter strips, filtration systems, and hydrodynamic devices.

The four volume-based and three flow-based BMP sizing criteria included in the Ventura County MS4 Permit (Order No. 09-0057) are included below.

The water quality design volume for volume-based BMPs must be determined using one of the following options:

- 1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or
- 2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or
- 3) The volume of runoff produced from a 0.75 inch storm event; or
- 4) 80 percent of the average runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Flow-based BMPs must be designed to capture and treat the water quality design flow rate generated from one of the following criterion:

- 1) The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or
- 2) The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records; or
- 3) Eight percent of the 50-year storm design flow rate as determined from the method provided below.

These sizing methods are explained below.

Methods for Determining the Water Quality Design Volume

Method 1: Urban Runoff Quality Management (URQM) Approach

The volume-based BMP sizing methodology described in Urban Runoff Quality Management (WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175-178) estimates the “maximized stormwater quality capture volume.” The URQM approach is based on the translation of rainfall to runoff using two regression equations. The first regression equation, which relates rainfall to runoff, was developed using two years of data from more than 60 urban watersheds nationwide. The second regression equation relates mean annual runoff-producing rainfall depths to the “Maximized Water Quality Capture Volume” which corresponds to the “knee of the cumulative probability curve”. This second regression was based on analysis of long-term rainfall data from seven rain gages representing climatic zones across the country. The Maximized Water Quality Capture Volume corresponds to approximately the 85th percentile runoff event, and ranges from 82 to 88%.

The two regression equations that form the URQM approach are as follows:

$$C = 0.858imp^3 - 0.78imp^2 + 0.774imp + 0.04 \tag{Equation E-1}$$

$$P_o = (a \cdot C) \cdot P_6 \tag{Equation E-2}$$

Where:

- C = watershed runoff coefficient (unitless)
- imp = watershed impervious ratio which is equal to the percent total imperviousness divided by 100 (ranges from 0 to 1)
- P_o = maximized detention storage volume based on the volume capture ratio as its basis (watershed inches)

- a = regression constant from least-squares analysis (unit less),
a=1.582 and a=1.963 for 24 and 48 hour draw down,
respectively
- P_6 = mean storm precipitation volume (watershed inches)

P_6 can be determined by two ways: Figure 5.3 in Urban Runoff Quality Management, or by performing analysis on local historical rainfall data. To determine the mean precipitation, EPA's Synoptic Rainfall Analysis Program – SYNOP – can be applied (see *Other Rainfall Analysis Methods* below).

The runoff coefficient equation in the URQM approach (Method 1) is not appropriate for the California BMP Handbook approach (Method 2), as Equation E-4 was developed in conjunction with the regression constants used in Method 1.

Method 2: Treatment of 80% or more of the Total Volume

Most water quality facilities are designed to treat only a portion of the runoff from a given site, as it is not economically feasible to capture 100% of the runoff. The percent of runoff treated by a basin is referred to as the “percent capture”. There are a number of methods which allow calculation of the percent capture, including the California Stormwater Quality Association (CASQA) method (recommended by the 2002 Ventura County Manual), and using the EPA Stormwater Management Model (SWMM).

CASQA Method

The California Stormwater Quality Association (CASQA) BMP Handbook method estimates the basin volume to achieve various levels of volume capture (e.g., 80% for this sizing criterion). In the CASQA BMP Handbook New Development and Redevelopment (2003), a proprietary version of the Storage, Treatment, Overflow, Runoff Model (STORM) is used as the basis for the volume-based BMP sizing criteria. The model results are presented as the relationship between “unit basin storage volume” and “% volume capture” of the BMP”, varying with drawdown time and runoff coefficient. Knowing the drawdown time, the runoff coefficient, and the desired percent capture will yield the “unit basin storage volume”. The “unit basin storage volume” can then be used to size the BMP using the following equation (note that “unit basin storage volume” is given in inches, so units will have to be adjusted accordingly):

$$\text{BMP Volume} = \text{Unit Basin Storage Volume} \times \text{Tributary Area} \quad (\text{Equation E-3})$$

Results for several rain gauges are presented in Appendix D of the CASQA BMP Handbook New Development and Redevelopment (CASQA, 2003). Results are provided for a range of runoff coefficients and for 24 hour and 48 hour drawn down times. In order to use the curves provided in Appendix D, it is necessary to know the

runoff coefficient for the area tributary to the BMP, the drawn down time (a.k.a. drain time) of the facility, and the percent capture goal (e.g., 80%).

Drawdown time is the time required to drain a facility that has reached its design capacity; usually expressed in hours. Drain time is important as it is a surrogate for residence time, which affects the particle settling in the basin. Estimates for design drain time vary, and ideally would be determined based on site-specific information on the size, shape, and density or settling velocity of suspended particulates in the runoff. Because this information is generally not available for a specific site, estimates of appropriate ranges for settling time have generally relied on settling column test information reported in the literature.

An important source of drain time information is settling column tests conducted by Grizzard et. al. (1986) as part of the Nationwide Urban Runoff Program (NURP). Grizzard found that settling times of 48 hours resulted in removals of 80% to 90% of total suspended solids (TSS). Rapid initial removal was also observed in stormwater samples with medium (100 to 215 mg/L) and high (721 mg/L) initial TSS concentrations. For example, at settling times of 24 hours, the 80% to 90% removals were already achieved in samples with medium and high initial TSS, whereas only 50% to 60% removal was achieved in those with low initial TSS.

Given the data provided above, a drain time of 36 to 48 hours is recommended for sizing volume-based BMPs. This is also consistent with the recommendation of vector control agencies that structures be designed to drain in less than 72 hours to minimize mosquito breeding.

The rain gauge that is recommended for use for the area permitted by the Ventura county MS4 Permit (Order No. 09-0057) is the Oxnard Equipment Yard Gauge (168), which has a 40 year rainfall record. The graph included in the CASQA handbook can be seen in Figure E-1 below.

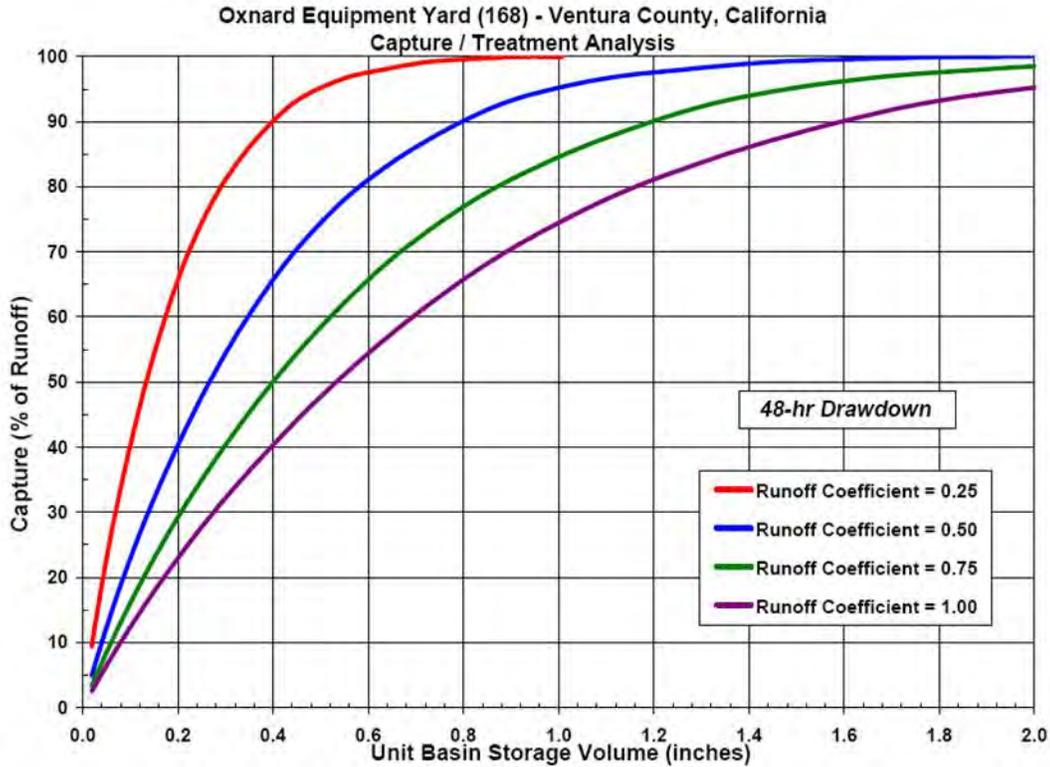


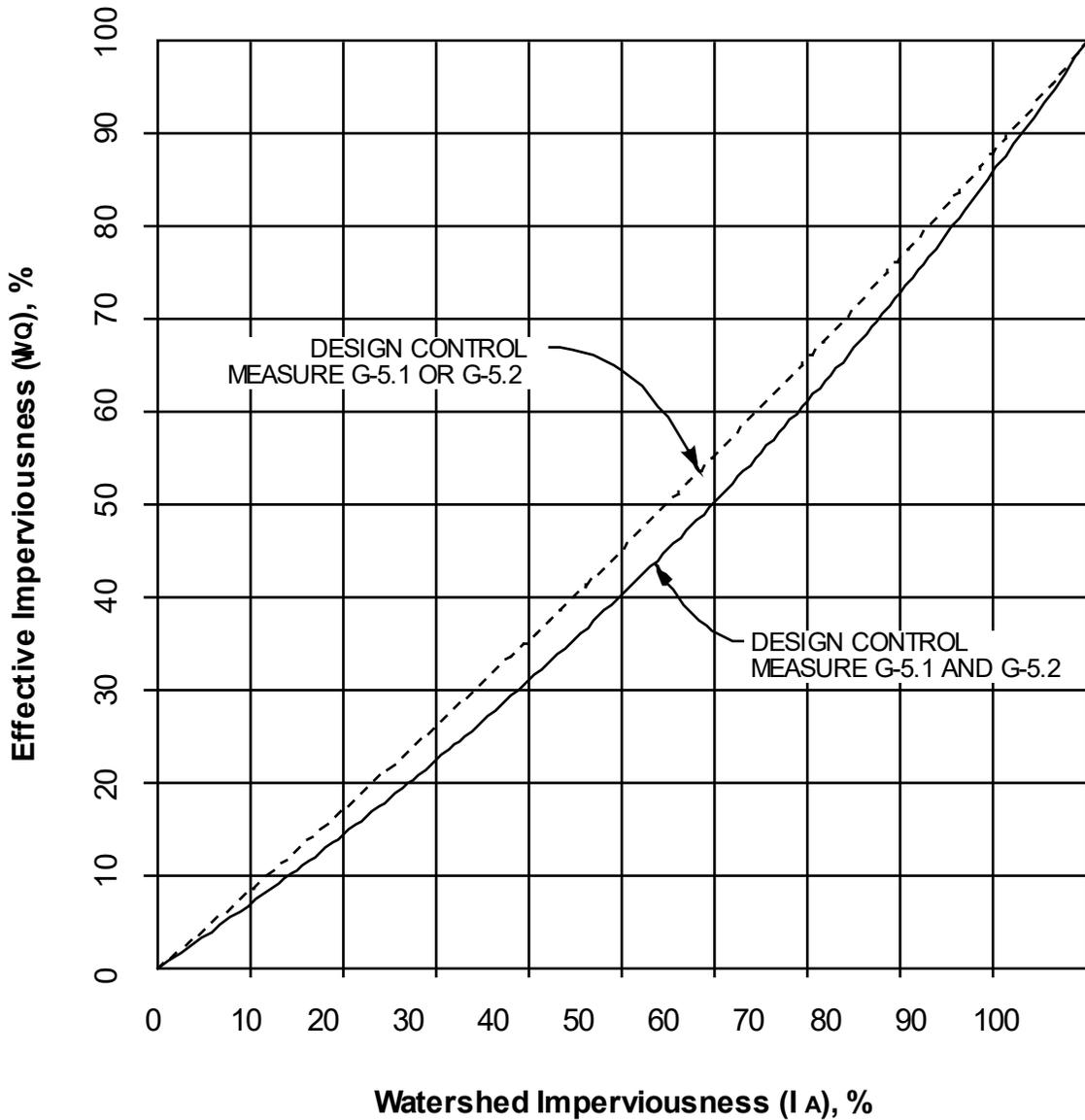
Figure E-1: CASQA 48-hour Drawdown Figure for Oxnard Gauge

This method has been modified for Ventura County. To use this method, follow the calculation procedure below. This refers to Figure E-3.

Ventura County Calculation Procedure

- 1) Review the area draining to the proposed treatment control measure. Determine the effective imperviousness (I_{WQ}) of the drainage area.
- 2) Estimate the total imperviousness (impervious percentage) of the site by the determining the weighted average of individual areas of like imperviousness.
- 3) Enter Figure E-2 along the horizontal axis with the value of total imperviousness calculated in Step 1. Move vertically up Figure E-2 until the appropriate curve (G-5.1 (filter strip) or G-5.2 (vegetated swale) employed individually or G-5.1 and G-5.2 employed together) is intercepted. Move horizontally across Figure E-2 until the vertical axis is intercepted. Read the Effective Imperviousness value along the vertical axis.
- 4) Note that if G-5.1 and/or G-5.2 are implemented on only a portion of the site, the site may be divided and effective imperviousness determined for the portion of the site for which site design controls have been implemented. The resulting effective imperviousness may be combined with total imperviousness of the

remainder of the site to determine a weighted average total imperviousness for the entire site.



G-5.1: TURF BUFFER
G-5.2: GRASS-LINED CHANNEL

ADAPTED FROM URBAN STORM DRAIN CRITERIA MANUAL
VOL. 3-BEST MANAGEMENT PRACTICES,
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT, 11/99

Figure E-2: Effective Imperviousness based on Watershed Imperviousness

- 5) Figure E-3 provides a direct reading of Unit Basin Storage Volumes required for 80% annual capture of runoff for values of “I_{wQ}” determined in Step 1. Enter the horizontal axis of Figure E-3 with the “I_{wQ}” value from Step 1. Move vertically up

Figure E-3 until the appropriate drawdown period line is intercepted. (The design drawdown period specified in the respective Fact Sheet for the proposed treatment control measure.) Move horizontally across Figure E-3 from this point until the vertical axis is intercepted. Read the Unit Basin Storage Volume along the vertical axis.

- 6) Figure E-3 is based on Precipitation Gage 168, Oxnard Airport. This gage has a data record of approximately 40 years of hourly readings and is maintained by Ventura County Flood Control District. Figure E-3 is for use only in the permit area specified in Regional Board Order No. 00-108, NPDES Permit No. CAS004002.
- 7) The SQDV for the proposed treatment control measure is then calculated by multiplying the Unit Basin Storage Volume by the contributing drainage area. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Stormwater Quality Design Volume Calculation

- 1) Determine the drainage area contributing to control measure, A_t . Example: 10 acres.
- 2) Determine the area of impervious surfaces in the drainage area, A_i . Example: 6.4 acres.
- 3) Calculate the percentage of impervious, $I_A = (A_i / A_t) * 100$

Example:

$$\text{Percent Imperviousness} = (A_i / A_t) * 100 = (6.4 \text{ acres} / 10 \text{ acres}) * 100 = 64\%$$

- 4) Determine Effective Imperviousness using Figure 3-4.
- 5) Determine design drawdown period for proposed control measure.
- 6) Determine the Unit Basin Storage Volume for 80% Annual Capture, V_u using Figure E-3.

$$\text{For } I_{WQ} / 100 = 0.60 \text{ and drawdown} = 40 \text{ hrs, } V_u = 0.64 \text{ in.}$$

- 7) Calculate the volume of the basin, V_b , where

$$V_b = V_u * A_t \quad \text{(Equation E-4)}$$

Where

$$V_b = \text{Volume of basin}$$

V_u = Unit basin storage volume

A_t = Total tributary area

8) $V_b = (0.64 \text{ in})(10 \text{ ac})(\text{ft}/12 \text{ in})(43,560 \text{ ft}^2 / \text{ac}) = 23,232 \text{ ft}^3$.

9) Solution: Size the proposed control measure for 23,232 ft³ and 40-hour drawdown.

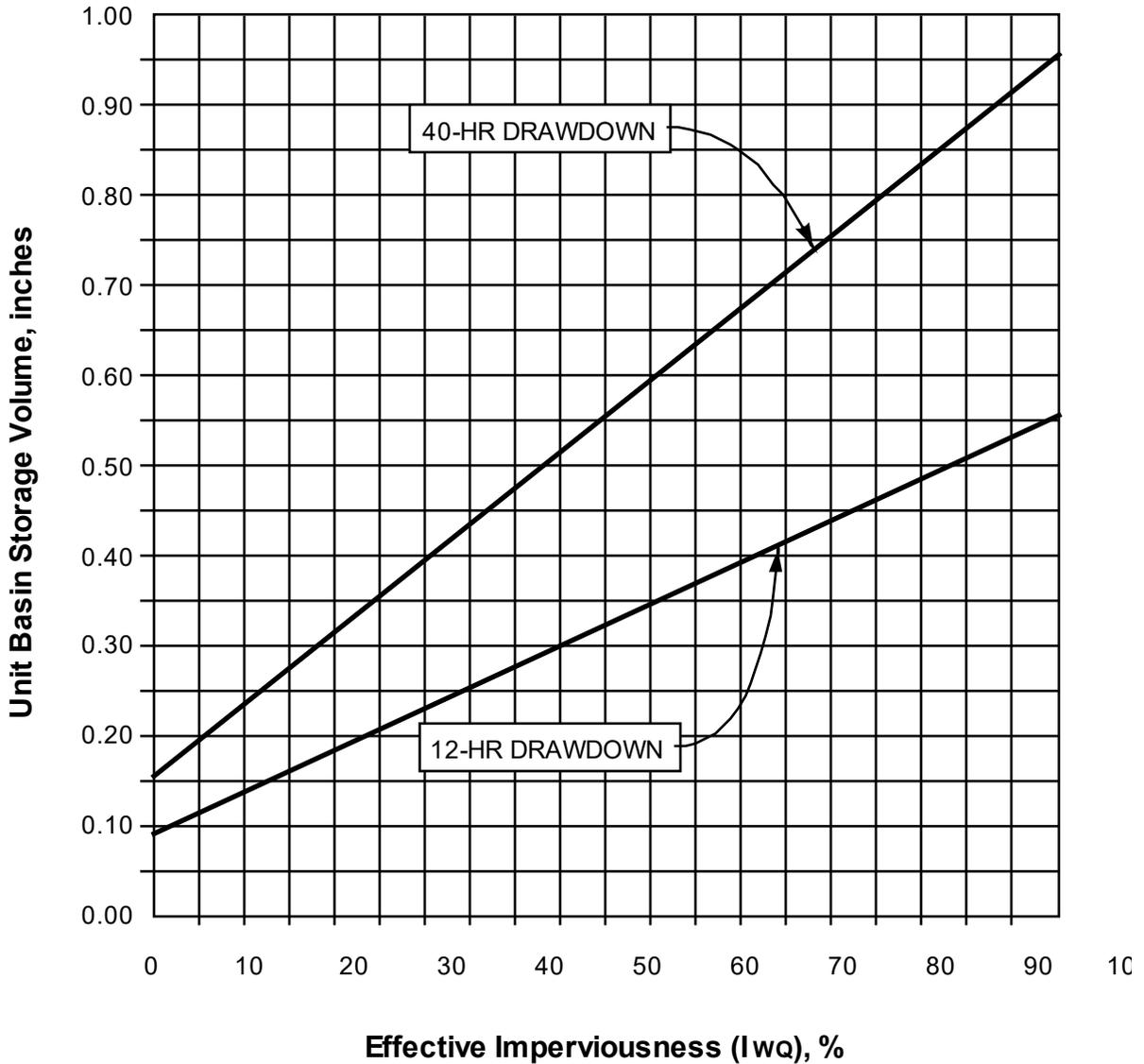


Figure E-3: Unit Basin Storage Volume for Design Volume Method 2

Method 3: 0.75 Inch Design Storm Approach

Equation E-8 can be used to determine the water quality design volume for Method 3.

Calculation Procedure

- 1) Determine the area from which runoff must be retained on-site (A_{retain}) using the method below:

The allowable EIA for a project site can be calculated as follows:

$$EIA_{\text{allowable}} = (A_{\text{project}}) * (\%_{\text{allowable}}) \quad (\text{Equation E-5})$$

Where:

- $EIA_{\text{allowable}}$ = the maximum impervious area from which runoff can be treated and discharged off-site [and not retained on-site] (acres).
- A_{project} = the total project area (acres). “Total project area” for new development and redevelopment projects is defined as the disturbed, developed, and undisturbed portions within the project’s property (or properties) boundary, at the project scale submitted for first approval.
- $\%_{\text{allowable}}$ = ranges from 5 percent to 30 percent, based on a project specific assessment of technical feasibility for retaining runoff and whether the project is located in an existing urban area.

The drainage area from which Project generated runoff must be retained on-site is the total impervious area minus the $EIA_{\text{allowable}}$, which can be calculated as follows:

$$A_{\text{retain}} = TIA - EIA_{\text{allowable}} = (P * A_{\text{project}}) - EIA_{\text{allowable}} \quad (\text{Equation E-6})$$

Where:

- A_{retain} = the drainage area from which runoff must be retained (acres)
- TIA = total impervious area (acres)
- $EIA_{\text{allowable}}$ = the maximum impervious area from which runoff can be treated and discharged off-site [and not retained on-site] (acres).
- P = imperviousness of project area (%) / 100
- A_{project} = the total project area (acres)

Calculation Procedure

- 1) Determine the area from which runoff must be retained on-site (A_{retain}) using method above.
- 2) Determine the runoff coefficient per the following method:

$$C = 0.95 * imp + C_p (1 - imp) \quad \text{(Equation E-7)}$$

Where:

- C = runoff coefficient
- imp = impervious fraction of watershed
- C_p = pervious runoff coefficient, determined using table below

Table E-1: Pervious Runoff Coefficient Based on Ventura Soil Type

Ventura Soil Type (Soil Number)	C_p value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

- 3) The volume can be calculated using equation E-8 below:

$$SQDV = C * (0.75 / 12) * A_{retain} \quad \text{(Equation E-8)}$$

Where:

- SQDV = the water quality design volume (acre-feet)
- C_{imp} = runoff coefficient, calculated by equation (4) above
- 0.75 = the design rainfall depth (in) [based on sizing method (c)]
- A_{retain} = the drainage area from which runoff must be retained (acres)

Method 4: 80 percent of the average runoff volume using an appropriate public domain continuous flow model

Models that can be used for this calculation include the Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Sizing Method 4 allows for alternative sizing methods to be used as long as the selected method produces a water quality design volume based on historical rainfall records that achieves 80% capture of the average runoff volume. While sizing Methods 2 and 3 are appropriate for low lying areas within Ventura County, continuous simulation (using historical rainfall record) is well suited to sizing BMPs in locations with higher average rainfall. This method is the recommended sizing method for Ventura County, using appropriate local data inputs. For BMP locations at higher elevations, with larger rainfall, Method 1 is also better suited to sizing volume-based BMPs using rainfall representative of the site where the BMP will be located.

Continuous runoff modeling takes a long, uninterrupted record of observed rainfall data and transforms it into a record of runoff data. This is done by use of a set of mathematical algorithms that represent the rainfall-runoff processes. EPA's Stormwater Management Model (U.S. EPA, 2000) (SWMM) is one type of continuous runoff model. The runoff module of SWMM subdivides each drainage area into two inclined planes, one for impervious areas and one for pervious areas. Manning's equation is applied to estimate runoff taking into account rainfall intensity, initial losses, evapotranspiration, and infiltration (for pervious areas). The width and length of each plane is selected based on the drainage area configuration and existing and proposed drainage features. Hourly rainfall data is the primary model input for generating runoff volumes and rates. Additional input data are required to characterize imperviousness, soils, topography, and losses associated with evapotranspiration, infiltration, and initial losses.

Sizing BMPs using this type of alternative should only be conducted by qualified personnel with a thorough understanding of the simulated hydrologic processes and operation of the selected hydrology model.

Methods for Determining the Water Quality Design Flow

Each of the flow-based sizing alternatives is described in detail below.

Method 1: Runoff Produced by 0.2 Inches per Hour Rainfall Intensity

The rainfall analysis for flow-based controls focuses on estimating the design rainfall intensity, which is then converted to a design flow rate using the rational method shown in Equation E-9.

$$SQDF = CiA \quad \text{(Equation E-9)}$$

Where:

SQDF	=	design flow rate (cfs)
C	=	runoff coefficient, calculated with the Ventura County Hydrology Manual method (see Equation E-5) (unitless)
i	=	rainfall intensity (in/hr) (0.2 in/hr)
A	=	watershed area (acres)

Note that 1 acre-in/hr = 1.0083 cfs; this conversion factor can be used with Equation D-9, but is not necessary as the uncertainty for the other parameters is generally well above 0.8%.

Method 2: Runoff Produced by Twice the 85th Percentile Rainfall Intensity

This method is analogous to the rational method used in Method 1, except that twice the historical 85th percentile rainfall intensity for the site location is used for the design rainfall intensity. This method is expected to result in a higher design rainfall intensity and design flow rate compared to Method 1 for most of the rain gages in the District.

Method 3: Runoff Produced by eight percent of the 50-year storm design flow rate

The Stormwater Quality Design Flow (SQDF) is defined to be equal to 8 percent of the peak rate of runoff flow from the 50-year storm as determined using the procedures set forth in the *Hydrology Manual*.

Calculation Procedure

- 1) The Stormwater Quality Design Flow (SQDF) in Ventura County is defined as SQDF
- 2) Calculate the peak rate of flow from the 50-year storm ($Q_{P, 50 \text{ yr.}}$) using the procedures set forth in the *Hydrology Manual* or as directed by the local agency Drainage Master Plan.
- 3) Convert $Q_{P, 50\text{yr}}$ (Step 2) to $Q_{P, \text{SQDF}}$ (Step 1).

$$Q_{P, \text{SQDF}} = 0.1 \times Q_{P, 50\text{yr}} \quad \text{(Equation E-10)}$$

Example Stormwater Quality Design Flow Calculation

The steps below illustrate calculation of SQDF:

- 1) Calculate the peak rate of flow from a 50-year storm.

$$Q_{p, 50 \text{ yr.}} = 10 \text{ cfs from the } \textit{Ventura County Hydrology Manual}$$

- 4) Convert $Q_{p, 50 \text{ yr}}$ (Step 2) to $Q_{p, \text{SQDF}}$ (Step 1)

$$\text{SQDF} = 0.8 \times 10 \text{ cfs} \quad (\text{Equation E-11})$$

$$\text{SQDF} = 0.8 \text{ cfs}$$

Rainfall Analysis Methods

The rainfall analysis methods listed below have the benefits of including the most recent rainfall data. Additionally, if the site is not close to an isohyet map rainfall gauge, these methods may be more accurate due to the variability of rainfall due to changing microclimates caused by elevation and distance from the ocean.

A resource available for obtaining rainfall data in Ventura County is the data collected and compiled by the National Climatic Data Center (NCDC).

There are many NCDC stations within Ventura County that collect or have collected hourly precipitation data. Some of these stations are no longer in operation and others may not have a sufficiently long period of record over which precipitation data has been collected to be of use for properly sizing treatment BMPs. NCDC data may be obtained online at the NCDC website <http://www.ncdc.noaa.gov/oa/ncdc.html>.

Rainfall Analysis Using EPA'S SYNOP Program

US EPA's Synoptic Rainfall Data Analysis Program (SYNOP) aggregates hourly rainfall data into individual storm events and computes event descriptive statistics. The SYNOP program calculates the duration, volume, and intensity for individual storms as well as average annual statistics. Recurrence interval and probability results are also available as output options. The SYNOP program allows the user to screen out storms that are not expected to result in runoff (see step 2 below).

The SYNOP rainfall analysis is conducted to output event-specific data in addition to average annual statistics. The individual storm event data can be ranked to give the 85th percentile storm or averaged to give the mean storm size.

Steps for conducting SYNOP rainfall analysis are as follows:

- 1) Obtain the hourly rainfall data for the gage of interest from the NCDC or other agency.
- 2) Run SYNOP for the available rain gage data. Model input parameters include the inter-event time and a minimum storm event size. The inter-event time specifies the minimum duration in which precipitation does not occur, used to define separate storm events, while the minimum storm event is the depth of precipitation generated by a storm below which runoff generally does not occur. Typically, an inter-event time of 6 hours (USEPA, 1989), and a minimum storm

event size of 0.10 inches are used (i.e., storms of 0.10 inches or less are not considered to produce runoff typically). Model results include event-specific and annual statistics during the period of record analyzed.

- 3) Rank and average the SYNOP storm event output.

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E.2 INF-1 Infiltration Basin/ INF-2 Infiltration Trench/ INF-4 Drywell

This worksheet can be used for sizing INF-1 Infiltration Basins, INF-2 Infiltration Trenches, or INF-4 drywells. An infiltration basin is an earthen basin constructed into naturally pervious soils which retains the SQDV and allows the retained runoff to percolate into the underlying native soils over a specified period of time. Infiltration trenches are long, narrow, gravel-filled trenches, often vegetated, that infiltrate stormwater runoff from small drainage areas. Drywells are similar to infiltration trenches, but the geometry and materials are slightly different. A dry well may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment, with the depth of the drywell greater than the width.

Sizing Methodology

Infiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 12 to 72 hours (see [Appendix E, Section E.1](#) for a discussion on drawdown time and BMP performance). The simple sizing procedures provided below can be used for either infiltration basins, infiltration trenches (see [INF-2: Infiltration Trench](#)) or drywells (INF-4: Drywell). For the routing modeling method, refer to [VEG-8 Sand Filters](#).

Step 1: Calculate the design volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see [Section 2](#) and Appendix E) with a 12 - 72 hour drawdown time (see [Appendix E, Section E.1](#)).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils, which will ultimately drive infiltration through the trench, and not the percolation rate of the filter media bed (refer to the “[Geometry and Sizing](#)” section of INF-2 for the recommended composition of the filter media bed for infiltration trenches). See [INF-1: Infiltration Basin](#) for guidance in developing design percolation rate correction factors.

Step 3: Calculate Surface Area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus (for infiltration trenches/ drywells with aggregate)

the void spaces within the filter media based on the computed porosity of the media (normally about 32%).

- 1) Determine the maximum depth of runoff that can be infiltrated within the required drain time as follows:

$$d_{\max} = \frac{P_{\text{design}} t}{12} \quad \text{(Equation E-12)}$$

Where:

d_{\max} = the maximum depth of water that can be infiltrated within the required drain time (ft)

P_{design} = design percolation rate of underlying soils (in/hr)

t = required drain time (hrs)

- 2) Choose the ponding depth (d_p) and/or trench depth (d_t) such that:

$$d_{\max} \geq d_p \quad \text{For Infiltration Basins} \quad \text{(Equation E-13)}$$

$$d_{\max} \geq n_t d_t + d_p \quad \text{For Infiltration Trenches or aggregate-filled Drywells} \quad \text{(Equation E-14)}$$

Where:

d_{\max} = the maximum depth of water that can be infiltrated within the required drain time (ft)

d_p = ponding depth (ft)

n_t = trench/drywell fill aggregate porosity (unitless)

d_t = depth of trench/drywell filter media (ft)

- 3) Calculate infiltrating surface area (filter bottom area) required:

$$A = \frac{SQDV}{((TP_{\text{design}} / 12) + d_p)} \quad \text{For Infiltration Basins} \quad \text{(Equation E-15)}$$

$$A = \frac{SQDV}{((TP_{\text{design}} / 12) + n_t d_t + d_p)} \quad \text{For Infiltration Trenches or aggregate-filled Drywells} \quad \text{(Equation E-16)}$$

Where:

$SQDV$ = stormwater quality design volume (ft³)

n_t	=	trench fill aggregate porosity (unitless)
P_{design}	=	design percolation rate (in/hr)
d_p	=	ponding depth (ft)
d_t	=	depth of trench filter media (ft)
T	=	fill time (time to fill to max ponding depth with water) (hrs) [use 2 hours for most designs]

Step 4: Size the forebay (applies to infiltration basins and trenches)

Infiltration facilities require pre-treatment to reduce sediment load into the basin. If a separate pre-treatment unit is not used, a forebay should be constructed for the facility. If a forebay is used, all inlets must enter the sediment forebay. The sediment forebay must be sized to 25% of the basin volume. The forebay must have interior slopes no steeper than 4:1.

- 1) Calculate the volume of the sediment forebay:

$$V_{forebay} = 0.25 \times SQDV \quad \text{(Equation E-17)}$$

Where:

$V_{forebay}$ = Volume of sediment forebay

$SQDV$ = Stormwater Quality Design Volume of Infiltration Basin

- 2) Select the depth of forebay, $d_{forebay}$. This is recommended to be...

- 3) Determine bottom surface area of forebay:

$$A_{forebay} = \frac{V_{forebay}}{d_{forebay}} \quad \text{(Equation E-18)}$$

Where:

$A_{forebay}$ = Bottom surface area of forebay

$V_{forebay}$ = Volume of forebay

$d_{forebay}$ = Depth of forebay

- 4) Size forebay outlet pipe. Pipe must 8 inches in diameter, minimum, and must be sized such that the forebay drains completely within 10 minutes.

Step 5: Provide conveyance capacity for filter clogging

The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Spillway and overflow

structures should be designed in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} =$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$ %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA =$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$ acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C =$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i =$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P =$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV =$ ft ³
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$	$P_{measured} =$ in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-1)	$S_A =$

2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-1)	$S_b =$
2-4. Calculate combined safety factor, $S = S_A \times S_b$	$S =$
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	$P_{design} =$ in/hr
Step 3: Calculate the surface area	
3-1. Enter required drain time(hours,72 hrs max.), t	$t =$ hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t (ft), $d_{max} = P_{design} t/12$	$d_{max} =$ ft
3-3. For basins, select ponding depth (ft), d_p , such that $d_p \leq d_{max}$	$d_p =$ ft
3-4. For trenches, enter trench fill aggregate porosity, n_t	$n_t =$
3-5. For trenches, enter depth of trench fill (ft), d_t	$d_t =$ ft
3-5. For trenches, select ponding depth d_p such that $d_p \leq d_{max} - n_t d_t$	$d_p =$ ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	$T =$ hrs
3-7. Calculate infiltrating surface area for infiltration basin (ft ²): $A_b = SQDV/(T P_{design} /12+d_p)$ OR Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells (ft ²): $A_t = SQDV/(T P_{design} /12+n_t d_t+d_p)$	$A_b =$ ft ² $A_t =$ ft ²
Step 4: Size the forebay (infiltration basins or trenches)	
If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4.	

<p>4-1. Calculate the volume of the forebay (ft³), $V_{\text{forebay}} = 0.25 * SQDV$</p>	<p>$V_{\text{forebay}} =$ ft³</p>
<p>4-2. Determine forebay depth (ft), d_{forebay}</p>	<p>$d_{\text{forebay}} =$ ft</p>
<p>4-3. Calculate forebay bottom surface area (ft²), $A_{\text{forebay}} = V_{\text{forebay}} / d_{\text{forebay}}$</p>	<p>$A_{\text{forebay}} =$ ft²</p>
<p>4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.</p>	
<p>Step 5: Provide conveyance capacity for filter clogging</p>	
<p>5-1. The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.</p>	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered to drain to an infiltration basin. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A = 10$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 0.5$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA = 6$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 5.5$ acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i = 0.75$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P = 0.06$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV = 8,500$ ft ³

Step 2: Calculate Design Infiltration Rate

Infiltration facilities require a minimum soil infiltration rate of 0.5 in/hr. If the rate exceeds 2.4 in/hr as in this example, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect the groundwater quality.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr min.), $P_{measured}$	$P_{measured} = 4.0 \text{ in/hr}$
2-2. Determine percolation rate correction factor, S_A , based on suitability assessment (see Section 6 INF-1)	$S_A = 3$
2-3. Determine percolation rate correction factor, S_B , based on design (see Section 6 INF-1)	$S_b = 3$
2-4. Calculate combined safety factor, $S = S_A \times S_b$	$S = 9$
2-5. Calculate the design percolation rate, $P_{design} = P_{measured}/S$	$P_{design} = 0.44 \text{ in/hr}$

Step 3: Determine Facility Size

The size of the infiltrating surface is determined by assuming the SQDV will fill the available ponding depth (plus the void spaces of the computed porosity (usually about 32%) of the gravel in the trench).

Step 3: Calculate the surface area	
3-1. Enter drawdown time (72 hrs max.), t_d	$t = 72 \text{ hrs}$
3-2. Calculate max. depth of runoff that can be infiltrated within the t , $d_{max} = P_{design} t/12$	$d_{max} = 2.4 \text{ ft}$
3-3. Enter trench fill aggregate porosity, n_t	$n_t = 0.32$
3-4. Enter depth of trench fill, d_t	$d_t = 4 \text{ ft}$
3-5. Select trench ponding depth d_p such that $d_p \leq d_{max} - n_t d_t$	$d_p = 1.1 \text{ ft}$
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	$T = 2 \text{ hrs}$

3-7. Calculate infiltrating surface area for infiltration basin: $A_b = SQDV / (T P_{design} / 12 + d_p)$	$A_b = 7,250 \text{ ft}^2$
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Step 4: Size the Forebay

A sediment forebay will be provided for this example as there is no separate pre-treatment unit provided.

Step 4: Size the forebay	
4-1. Calculate the volume of the forebay, $V_{forebay} = 0.25 * SQDV$	$V_{forebay} = 2,100 \text{ ft}^3$
4-2. Determine forebay depth, $d_{forebay}$	$d_{forebay} = 3 \text{ ft}$
4-3. Calculate forebay bottom surface area, $A_{forebay} = V_{forebay} / d_{forebay}$	$A_{forebay} = 700 \text{ ft}^2$
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	

Step 5: Provide Conveyance Capacity for Flows Higher than Qwq

The infiltration facility should be placed off-line, but an emergency overflow for flows greater than the peak design storm must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

E.3 INF-3 Bioretention

Sizing Methodology

Bioretention areas can be sized using one of two methods: a simple sizing method or a routing method. The simple sizing procedure is summarized below. Continuous simulation modeling, routing spreadsheets, and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of bioretention may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices. For the routing modeling method, refer to the Sand Filter design guidance (FILT-1). A bioretention sizing worksheet and example are provided in this appendix. Planter boxes are sized the same as bioretention areas with underdrains using parameters appropriate for planter boxes.

With either method, the runoff entering the facility must completely drain the ponding area within 48 hours, and runoff must be completely infiltrated within 96 hours. Bioretention is to be sized, with or without underdrains, such that the SQDV will fill the available ponding depth, the void spaces in the planting soil, and the optional gravel layer below the media.

Step 1: Determine the stormwater quality design volume (SQDV)

Bioretention areas should be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltrating bioretention facilities, the design percolation rate discussed here is the percolation rate of the underlying soils, which will drive infiltration through the facility. See [INF-3: Bioretention](#) for guidance in developing design percolation rate correction factors.

Step 3: Calculate the bioretention surface area

- 1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time:

$$d_{\max} = \frac{P_{\text{design}} \times t_{\text{ponding}}}{12 \frac{\text{in}}{\text{ft}}}$$

Where:

- $t_{ponding}$ = required drain time of surface ponding (48 hrs)
- P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)
- d_{max} = the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft)

2) Choose surface ponding depth (d_p) such that:

$$d_p \leq d_{max} \quad \text{(Equation E-19)}$$

Where:

- d_p = selected surface ponding depth (ft)
- d_{max} = the maximum depth of water that can be infiltrated within the required drain time (ft)

3) Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of the bioretention area as follows:

$$d_{effective} \leq d_p + n_{media}^* l_{media} + n_{gravel} l_{gravel} \quad \text{(Equation E-20)}$$

Where:

- $d_{effective}$ = total equivalent depth of water stored in bioretention area (ft)
- d_p = surface ponding depth (ft)
- n_{media}^* = available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions
- l_{media} = thickness of amended soil media layer (ft)
- n_{gravel} = porosity of optional gravel layer (ft/ft), approximately 0.30 ft/ft
- l_{gravel} = thickness of optional gravel layer (ft)

4) Check that entire effective depth (surface plus subsurface storage) infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96 \text{ hr} \quad \text{(Equation E-21)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft)
 P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to Step [A].

If $t_{total} \leq 96$ hrs, then proceed to Step [E].

5) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_{effective}} \quad \text{(Equation E-22)}$$

Where:

$SQDV$ = stormwater quality design volume (ft³)

Step 4: Calculate the bioretention total footprint

Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is measured at the as the filter bottom area (toe of side slopes).

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} =$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$ %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA =$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$ acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C =$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i =$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P =$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV =$ ft ³
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr) (0.5 in/hr minimum), $P_{measured}$	$P_{measured} =$ in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-3)	$S_A =$

2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-3)	$S_B =$
2-4. Calculate combined safety factor, $S = S_A \times S_b$	$S =$
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	$P_{design} =$ in/hr
Step 3: Calculate Bioretention Infiltrating surface area	
3-1. Enter water quality design volume (ft ³), $SQDV$	$SQDV =$ ft ³
3-2. Enter design percolation rate (in/hr), P_{design}	$P_{design} =$ in/hr
3-3 Enter the required drain time (48 hours), $t_{ponding}$	$t_{ponding} =$ hours
3-3. Calculate the maximum depth of surface ponding that can be infiltrated within the required drain time (ft): $d_{max} = (P_{design} \times t_{ponding})/12$	$d_{max} =$ ft
3-4. Select surface ponding depth (ft), d_p , such that $d_p \leq d_{max}$	$d_p =$ ft
3-5. Select thickness of amended media (ft, 2 feet minimum, 3 preferred), l_{media}	$l_{media} =$ ft
3-6. Enter porosity of amended media (roughly 25% or 0.25 ft/ft), n_{media}	$n_{media} =$ ft/ft
3-7. Select thickness of optional gravel layer (ft), l_{gravel}	$l_{gravel} =$ ft
3-8. Enter porosity of gravel (roughly 30% or 0.3 ft/ft), n_{gravel}	$n_{gravel} =$ ft/ft
3-9. Calculate the total effective storage depth of bioretention facility (ft): $d_{effective} \leq (d_p + n_{media}l_{media} + n_{gravel}l_{gravel})$	$d_{effective} =$ ft

<p>3-10. Check that the entire effective depth infiltrates in required drainage time, 96 hours:</p> $t_{total} = (d_{effective}/P_{design}) \times 12$ <p>If $t_{total} > 96$ hours, reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 3-4.</p> <p>If $t_{total} \leq 96$ hours, proceed to 3-11.</p>	$t_{total} = \quad \text{hours}$
<p>3-11. Calculate the required infiltrating surface area (ft²):</p> $A_{req} = SQDV/d_{effective}$	$A_{req} = \quad \text{ft}^2$
<p>Step 4: Calculate Bioretention Area Total Footprint</p>	
<p>4-1. Calculate total footprint required by including a buffer for side slopes and freeboard (ft²) [A_{req} is measured at the as the filter bottom area (toe of side slopes)], A_{tot}</p>	$A_{tot} = \quad \text{ft}^2$

Design Example

Bioretention areas have several components that allow the pretreatment, spreading, filtration, collection and discharge of the incoming flows.

Step 1: Determine water quality design volume

For this design example, a 10-acre site with soil type 4 and 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} = 10$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 0.5$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA = 6$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 5.5$ acres
1-7. Determine pervious runoff coefficient using <u>Table E-1</u> , C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i = 0.75$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P = 0.06$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV = 8,500$ ft ³

Step 2: Determine the design percolation rate

For this design example, a native soil percolation rate of 1.5 in/hr is assumed.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr minimum), $P_{measured}$	$P_{measured} = 4.0$ in/hr
2-2. Determine percolation rate correction factor, S_A , based on suitability assessment (see Section 6 INF-1)	$S_A = 3$
2-3. Determine percolation rate correction factor, S_B , based on design (see Section 6 INF-1)	$S_b = 3$
2-4. Calculate combined safety factor, $S = S_A \times S_b$	$S = 9$
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	$P_{design} = 0.44$ in/hr

Step 3: Determine bioretention/ planter box area footprint

A bioretention area is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a plant mix filter bed (planting soil mixed with sand content = 70%) through which the stored runoff must percolate to obtain treatment.

Step 3: Calculate bioretention/planter box surface area	
3-1. Enter water quality design volume (ft ³), $SQDV$	$SQDV = 8,500$ ft ³
3-2. Enter design percolation rate (in/hr), P_{design}	$P_{design} = 0.375$ in/hr
3-3 Enter the required drain time (48 hours), $t_{ponding}$	$t_{ponding} = 48$ hours
3-3. Calculate the maximum depth of surface ponding (ft) that can be infiltrated within the required drain time (48 hours): $d_{max} = (P_{design} \times t_{ponding})/12$	$d_{max} = 1.5$ ft
3-4. Select surface ponding depth d_p such that $d_p \leq d_{max}$	$d_p = 1.5$ ft
3-5. Select thickness of amended media (2 feet minimum, 3 preferred), l_{media}	$l_{media} = 3$ ft

Step 3: Calculate bioretention/planter box surface area	
3-6. Enter porosity of amended media (roughly 25% or 0.25 ft/ft), n_{media}	$n_{media} = 0.25 \text{ ft/ft}$
3-7. Select thickness of optional gravel layer (ft), l_{gravel}	$l_{gravel} = 1 \text{ ft}$
3-8. Enter porosity of gravel (roughly 30% or 0.3 ft/ft), n_{gravel}	$n_{gravel} = 0.3 \text{ ft/ft}$
3-9. Calculate the total effective storage depth of bioretention facility (ft): $d_{effective} \leq (d_p + n_{media}l_{media} + n_{gravel}l_{gravel})$	$d_{effective} = 2.6 \text{ ft}$
3-10. Check that the entire effective depth infiltrates in required drainage time, 96 hours: $t_{total} = (d_{effective}/P_{design}) \times 12$ If $t_{total} > 96$ hours, reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 3-4. If $t_{total} \leq 96$ hours, proceed to 3-11.	$t_{total} = 82 \text{ hours}$
3-11. Calculate the required infiltrating surface area (ft ²), $A_{req} = SQDV/d_{effective}$	$A_{req} = 3,300 \text{ ft}^2$

Step 4: Calculate Bioretention Area Total Footprint

For this design example, a natural-shaped bioretention area is assumed, with 3:1 side slopes. To calculate the total footprint, the side slopes would be added to the design geometry.

E.4 INF-5 Permeable Pavement

Sizing Methodology

Permeable pavement (including the base layers) shall be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity; this is essential in order to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

Permeable pavement must be built and designed by a licensed civil engineer in accordance with Ventura County roadway and pavement specifications.

Step 1: Calculate the design volume

Permeable pavement shall be sized to capture and treat the stormwater quality design volume, SQDV (see [Section 2](#) and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltrating bioretention facilities, the design percolation rate discussed here is the percolation rate of the underlying soils, which will drive infiltration through the facility. See INF-5: Permeable Pavement for guidance in developing design percolation rate correction factors.

Step 3: Determine gravel drainage layer depth

Permeable pavement (including the base layers) shall be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

- 1) Calculate the maximum depth of runoff, d_{max} , that can be infiltrated within the drawdown time:

$$d_{max} = \frac{P_{design} \cdot t}{12} \quad \text{(Equation E-23)}$$

Where:

- d_{max} = maximum depth that can be infiltrated (ft)
 P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)
 t = drawdown time (72 hrs maximum) (hr)

- 1) Select the gravel drainage layer depth, l , such that:

$$d_{max} \geq n \times l \quad \text{(Equation E-24)}$$

Where:

- d_{max} = maximum depth that can be infiltrated (ft) (see 1) above)
 n = gravel drainage layer porosity(unitless) (generally about 32% or 0.32 for gravel)
 l = gravel drainage layer depth (ft)

Step 4: Determine infiltrating surface area

- 1) Calculate infiltrating surface area for permeable pavement, A :

$$A = \frac{SQDV}{\frac{TP_{design}}{12} + nl} \quad \text{(Equation E-25)}$$

Where:

- P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)
 n = gravel drainage layer porosity(unitless)[about 32% or 0.32 for gravel]
 l = depth of gravel drainage layer (ft)
 T = time to fill the gravel drainage layer with water (use 2 hours for most designs) (hr)

Step 5: Provide conveyance capacity for clogging

The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged. See INF-5 Permeable Pavement for overflow details.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} =$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA =$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$ acres
1-7. Determine pervious runoff coefficient using <u>Table E-1</u> , C_p	$C_p =$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C =$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i =$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P =$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV =$ ft ³
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr minimum), $P_{measured}$	$P_{measured} =$ in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-5)	$S_A =$

Step 2: Determine the design percolation rate	
2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-5)	$S_B =$
2-4. Calculate combined safety factor, $S = S_A \times S_b$	$S =$
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	$P_{design} =$ in/hr
Step 3: Determine the Gravel Drainage Layer Depth	
3-1. Enter drawdown time (hours, 72 hrs max.), t	$t =$ hours
3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t , $d_{max} = P_{design}t/12$	$d_{max} =$ ft
3-3. Enter the gravel drainage layer porosity, n (typically 32% or 0.32 for gravel)	$n =$
3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$	$l =$ ft
Step 4: Determine infiltrating surface area	
4-1. Enter gravel drainage layer porosity, n	$n =$
4-2. Enter depth of gravel drainage layer (ft), l	$l =$ ft
4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), T	$T =$ hrs
4-4. Calculate infiltrating surface area (ft ³): $A = SQDV / ((TP_{design}/12) + nl)$	$A =$ ft ²
Step 5: Provide conveyance capacity for clogging	
5-1. The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged.	

Design Example

Step 1: Determine Water Quality Design Volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine Water Quality Design Volume	
1-1. Enter Project area (acres), $A_{project}$	$A = 10$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 0.5$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA = 6$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 5.5$ acres
1-7. Determine pervious runoff coefficient using Table E-1 , C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i = 0.75$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P = 0.06$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV = 8,500$ ft ³

Step 2: Calculate Design Percolation Rate

Permeable pavement with no underdrain requires a minimum soil infiltration rate of 0.5 in/hr. For this design example, a native soil percolation rate of 1.5 in/hr is assumed.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr min.), $P_{measured}$	$P_{measured} = 4.0 \text{ in/hr}$
2-2. Determine percolation rate correction factor, S_A , based on suitability assessment (see Section 6 INF-1)	$S_A = 3$
2-3. Determine percolation rate correction factor, S_B , based on design (see Section 6 INF-1)	$S_b = 3$
2-4. Calculate combined safety factor, $S = S_A \times S_b$	$S = 9$
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	$P_{design} = 0.44 \text{ in/hr}$

Step 3: Determine maximum depth that can be infiltrated

Based on the design infiltration rate and the max drawdown, determine the maximum depth that can be infiltrated within the time constraints.

Step 3: Determine maximum depth that can be infiltrated	
3-1. Enter drawdown time (72 hrs max.), t	$t = 72 \text{ hrs}$
3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t , $d_{max} = P_{design}t/12$	$d_{max} = 2.6 \text{ ft}$
3-3. Enter the gravel drainage layer porosity, n (typically 32% or 0.32 for gravel)	$n = 0.32$
3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$	$l = 8 \text{ ft}$

Step 4: Determine the infiltrating surface area (pavement area)

Using the depth calculated in Step 3, the required infiltrating surface area of the pavement can be calculated.

Step 4: Determine the infiltrating surface area	
4-1. Enter gravel drainage layer porosity, n	$n = 0.32$
4-2. Enter depth of gravel drainage layer (ft), l	$l = 8 \text{ ft}$
4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), T	$T = 2 \text{ hrs}$
4-4. Calculate infiltrating surface area (ft ³): $A = SQDV / (TP_{design} / 12) + n * l$	$A = 1,630 \text{ ft}^2$

Step 5: Provide conveyance capacity for clogging

The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged.

E.5 VEG-1 Bioretention/VEG-2 Planter Box

Sizing Methodology

Bioretention areas can be sized using one of two methods: a simple sizing method or a routing method. The simple sizing procedure is summarized below. Continuous simulation modeling, routing spreadsheets, and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of bioretention may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices. For the routing modeling method, refer to the Sand Filter design guidance (FILT-1). A bioretention sizing worksheet and example are provided in this appendix. Planter boxes are sized the same as bioretention areas with underdrains using parameters appropriate for planter boxes.

With either method, the runoff entering the facility must completely drain the ponding area within 48 hours, and runoff must be completely infiltrated within 96 hours. Bioretention is to be sized, with or without underdrains, such that the SQDV will fill the available ponding depth, the void spaces in the planting soil, and the optional aggregate layer.

Step 1: Determine the stormwater quality design volume (SQDV)

Bioretention areas should be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for newly installed non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design percolation rate is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design percolation rate.

Step 3: Calculate the bioretention or planter box surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

- 1) Select a surface ponding depth (d_p) that satisfies geometric criteria and congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however requires greater consideration for public safety and energy dissipation.

- 2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft} \leq 48 \text{ hours} \quad (\text{Equation E-26})$$

Where:

- $t_{ponding}$ = required drain time of surface ponding (48 hrs)
 d_p = selected surface ponding water depth (ft)
 K_{design} = design saturated hydraulic conductivity (in/hr) (see Step 2, above)

If $t_{ponding}$ exceeds 48 hours, return to (1) and reduce surface ponding or increase media K_{design} . Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 48 hours unless a low K_{design} is specified.

- 3) Compute depth of water that may be considered to be filtered during the design storm event as follows:

$$d_{filtered} = \text{Minimum} \left[\frac{K_{design} \times T_{routing}}{12 \frac{in}{ft}}, \frac{d_p}{2} \right] \quad (\text{Equation E-27}),$$

Where:

- $d_{filtered}$ = depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed half of the surface ponding depth (d_p)
 K_{design} = design saturated hydraulic conductivity (in/hr) (see Step 2, above)
 $T_{routing}$ = storm duration that may be assumed for routing calculations; this should be assumed to be **3 hours** unless rationale for an alternative assumption is provided
 d_p = selected surface ponding water depth (ft)

- 4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \quad (\text{Equation E-28})$$

Where:

A_{req}	=	required area at bottom of filter area (ft ²); does not account for side slopes and freeboard
$SQDV$	=	stormwater quality design volume (ft ³)
d_p	=	selected surface ponding water depth (ft)
$d_{filtered}$	=	depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See previous step)

Step 4: Calculate the bioretention total footprint

Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is measured at the filter bottom area (toe of side slopes).

Step 5: Calculate underdrain system capacity

Underdrains are required for planter boxes and bioretention with underdrains. For guidance on sizing, refer to step 5 of the worksheet below. Alternatively, the Ventura County Hydrology Manual can be used for pipe sizing guidance.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} =$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ %
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA =$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$ acres
1-7. Determine pervious runoff coefficient using Table E-1 , C_p	$C_p =$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C =$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i =$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P =$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV =$ ft ³
Step 2: Determine the design percolation rate	
2-1. Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate), K_{design}	$K_{design} =$ in/hr

Step 3: Calculate Bioretention/Planter Box surface area		
3-1. Enter water quality design volume (ft ³), $SQDV$	$SQDV =$	ft ³
3-2. Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	in/hr
3-3. Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	ft
3-4. Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) \times 12$	$t_{ponding} =$	hrs
3-5. Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	hrs
3-6. Calculate depth of water (ft) filtered by using the following two equations: $d_{filtered,1} = (K_{design} \times T_{routing}) / 12$ $d_{filtered,2} = d_p / 2$	$d_{filtered,1} =$ $d_{filtered,2} =$	ft ft
3-7 Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	ft
3-8. Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (d_p + d_{filtered})$	$A_{req} =$	ft ²
Step 4: Calculate Bioretention Area Total Footprint		
4-1. Calculate total footprint required by including a buffer for side slopes and freeboard (ft ²) [A_{req} is measured at the as the filter bottom area (toe of side slopes)], A_{tot}	$A_{tot} =$	ft ²
Step 5: Calculate Underdrain System Capacity		
To calculate the underdrain system capacity, continue through steps 5-1 to 5-7.		

Step 5: Calculate Underdrain System Capacity	
5-1. Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req}/43,200$	$Q_f =$ cfs
5-2. Enter minimum slope for energy gradient, S_e	$S_e =$
5-3. Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$
5-4. Enter pipe diameter (min 6 inches), D	$D =$ in
5-5. Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$ ft
5-6. Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$ ft/s
5-7. Calculate pipe capacity (cfs), $Q_{cap} = 0.25 \pi (D/12)^2 V_p$	$Q_{cap} =$ cfs

Design Example

Bioretention areas have several components that allow the pretreatment, spreading, filtration, collection and discharge of the incoming flows.

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine Water Quality Design Volume	
1-1. Enter drainage area, A	A = 10 acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 0.5$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area, $TIA = A_{project} * Imp$	$TIA = 6$ acres
1-6. Determine the total area from which runoff must be retained, $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 5.5$ acres
1-7. Determine pervious runoff coefficient using <u>Table E-1</u> , C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm, P_i (in)	$P_i = 0.75$ in
1-10. Calculate rainfall depth, $P = P_i / 12$	$P = 0.06$ ft
1-11. Calculate water quality design volume, $SQDV = 43560 * P * A_{retain} * C$	$SQDV = 8,500$ ft ³

Step 2: Determine the design percolation rate

For this design example, the recommended amended filter hydraulic conductivity is used, 2.5 in/hr.

Step 2: Determine the design percolation rate	
2-1. Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate), K_{design}	$K_{design} = 2.5$ in/hr

Step 3: Determine bioretention/ planter box area footprint

A bioretention area is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a plant mix filter bed (planting soil mixed with sand content = 70%) through which the stored runoff must percolate to obtain treatment.

Step 3: Calculate Bioretention/Planter Box surface area	
3-1. Enter water quality design volume (ft ³), $SQDV$	$SQDV = 8,500$ ac-ft
3-2. Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} = 2.5$ in/hr
3-3. Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p = 1.5$ ft
3-4. Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p/K_{design}) \times 12$	$t_{ponding} = 7.2$ hrs
3-5. Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} = 3$ hrs
3-6. Calculate depth of water (ft) filtered by using the minimum of the following two equations: $d_{filtered,1} = (K_{design} \times T_{routing})/12$ $d_{filtered,2} = d_p / 2$	$d_{filtered,1} = 0.63$ ft $d_{filtered,2} = 0.75$ ft
3-7 Enter the resultant depth (the minimum of the two calculated above), $d_{filtered}$	$d_{filtered} = 0.63$ ft
3-8. Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV/(d_p + d_{filtered})$	$A_{req} = 4,000$ ft ²

Step 4: Calculate Bioretention Area Total Footprint

For this design example, a natural-shaped bioretention area is assumed, with 3:1 side slopes. To calculate the total footprint, the side slopes would be added to the design geometry.

Step 5: Calculate filter longitudinal underdrain collection pipe

All underdrain pipes must be 6 inches or greater in diameter to facilitate cleaning.

Step 5: Calculate underdrain system (required for planter box)	
To calculate the underdrain system capacity, continue through steps 5-1 to 5-7. If you don't need to calculate the underdrain capacity, skip this step.	
5-1. Calculated filtered flow rate to be conveyed by the longitudinal drain pipe (cfs), $Q_f = K_{design} A_{req}/43,200$	$Q_f = 0.085$ cfs
5-2. Enter minimum slope for energy gradient, S_e	$S_e = 0.005$
5-3. Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} = 140$
5-4. Enter pipe diameter (min 6 in), D	$D = 6$ in
5-5. Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h = 0.13$ ft
5-6. Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318C_{HW}R_h^{0.63}S_e^{0.54}$	$V_p = 2.9$ ft/s
5-7. Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2V_p$	$Q_{cap} = 0.57$ cfs

E.6 VEG-3 Vegetated Swale

Sizing Methodology

The flow capacity of a vegetated swale is a function of the longitudinal slope (parallel to flow), the resistance to flow (i.e. Manning's roughness), and the cross sectional area. The cross section is normally approximately trapezoidal and the area is a function of the bottom width and side slopes. The flow capacity of vegetated swales should be such that the design water quality flow rate will not exceed a flow depth of 2/3 the height of the vegetation within the swale or 4 inches at the water quality design flow rate. Once design criteria have been selected, the resulting flow depth for the design water quality design flow rate is checked. If the depth restriction is exceeded, swale parameters (e.g. longitudinal slope, width) are adjusted to reduce the flow depth.

Procedures for sizing vegetated swales are summarized below. A vegetated swale sizing worksheet and example are also provided.

Step 1: Select design flows

The swale sizing is based on the stormwater quality design flow SQDF (see [Section E.1](#)).

Step 2: Calculate swale bottom width

The swale bottom width is calculated based on Manning's equation for open-channel flow. This equation can be used to calculate discharges as follows:

$$Q = \frac{1.49AR^{0.67}S^{0.5}}{n}$$

(Equation E-29)

Where:

Q	=	flow rate (cfs)
n	=	Manning's roughness coefficient (unitless)
A	=	cross-sectional area of flow (ft ²)
R	=	hydraulic radius (ft) = area divided by wetted perimeter
S	=	longitudinal slope (ft/ft)

For shallow flow depths in swales, channel side slopes are ignored in the calculation of bottom width. Use the following equation (a simplified form of Manning's formula) to estimate the swale bottom width:

$$b = \frac{SQDF * n_{wq}}{1.49y^{0.67}s^{0.5}} \quad (\text{Equation E-30})$$

Where:

b	=	bottom width of swale (ft)
$SQDF$	=	stormwater quality design flow (cfs)
n_{wq}	=	Manning's roughness coefficient for shallow flow conditions = 0.2 (unitless)
y	=	design flow depth (ft)
s	=	longitudinal slope (along direction of flow) (ft/ft)

Proceed to Step 3 if the bottom width is calculated to be between 2 and 10 feet. A minimum 2-foot bottom width is required. Therefore, if the calculated bottom width is less than 2 feet, increase the width to 2 feet and recalculate the design flow depth y using the Equation 4-13, where Q_{wq} , n_{wq} , and s are the same values as used above, but $b = 2$ feet.

The maximum allowable bottom width is 10 feet; therefore if the calculated bottom width exceeds 10 feet, then one of the following steps is necessary to reduce the design bottom width:

- 1) Increase the longitudinal slope (s) to a maximum of 6 feet in 100 feet (0.06 feet per foot).
- 2) Increase the design flow depth (y) to a maximum of 4 inches.
- 3) Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet), without compromising the design flow depth and swale lateral slope requirements. Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.

Step 3: Determine design flow velocity

To calculate the design flow velocity through the swale, use the flow continuity equation:

$$V_{wq} = SQDF/A_{wq} \quad (\text{Equation E-31})$$

Where:

V_{wq}	=	design flow velocity (fps)
$SQDF$	=	stormwater quality design flow (cfs)

$$A_{wq} = by + Zy^2 = \text{cross-sectional area (ft}^2\text{) of flow at design depth, where } Z = \text{side slope length per unit height (e.g., } Z = 3 \text{ if side slopes are 3H:1V)}$$

If the design flow velocity exceeds 1 foot per second, go back to Step 2 and modify one or more of the design parameters (longitudinal slope, bottom width, or flow depth) to reduce the design flow velocity to 1 foot per second or less. If the design flow velocity is calculated to be less than 1 foot per second, proceed to Step 4. *Note: It is desirable to have the design velocity as low as possible, both to improve treatment effectiveness and to reduce swale length requirements.*

Step 4: Calculate swale length

Use the following equation to determine the necessary swale length to achieve a hydraulic residence time of at least 7 minutes:

$$L = 60t_{hr}V_{wq} \quad \text{(Equation E-32)}$$

Where:

L = minimum allowable swale length (ft)

t_{hr} = hydraulic residence time (min)

V_{wq} = design flow velocity (fps)

The minimum swale length is 100 feet; therefore, if the swale length is calculated to be less than 100 feet, increase the length to a minimum of 100 feet, leaving the bottom width unchanged. If a larger swale can be fitted on the site, consider using a greater length to increase the hydraulic residence time and improve the swale's pollutant removal capability. If the calculated length is too long for the site, or if it would cause layout problems, such as encroachment into shaded areas, proceed to Step 5 to further modify the layout. If the swale length can be accommodated on the site (meandering may help), proceed to Step 6.

Step 5: Adjust swale layout to fit on site

If the swale length calculated in Step 4 is too long for the site, the length can be reduced (to a minimum of 100 feet) by increasing the bottom width up to a maximum of 16 feet, as long as the 10 minute retention time is retained. However, the length cannot be increased in order to reduce the bottom width because Manning's depth-velocity-flow rate relationships would not be preserved. If the bottom width is increased to greater than 10 feet, a low flow dividing berm is needed to split the swale cross section in half to prevent channelization.

Length can be adjusted by calculating the top area of the swale and providing an equivalent top area with the adjusted dimensions.

- 1) Calculate the swale treatment top area based on the swale length calculated in Step 4:

$$A_{top} = (b_i + b_{slope})L_i \quad \text{(Equation E-33)}$$

Where:

A_{top} = top area (ft²) at the design treatment depth

b_i = bottom width (ft) calculated in Step 2

b_{slope} = the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, $b_{slope} = 2$ feet)

L_i = initial length (ft) calculated in Step 4

- 2) Use the swale top area and a reduced swale length L_f to increase the bottom width, using the following equation:

$$L_f = A_{top} / (b_f + b_{slope}) \quad \text{(Equation E-34)}$$

Where:

L_f = reduced swale length (ft)

b_f = increased bottom width (ft).

- 3) Recalculate V_{wq} according to Step 3 using the revised cross-sectional area A_{wq} based on the increased bottom width b_f . Revise the design as necessary if the design flow velocity exceeds 1 foot per second.
- 4) Recalculate to assure that the 10 minute retention time is retained.

Step 6: Provide conveyance capacity for flows higher than SQDF

Vegetated swales may be designed as flow-through channels that convey flows higher than the water quality design flow rate, or they may be designed to incorporate a high-flow bypass upstream of the swale inlet. A high-flow bypass usually results in a smaller swale size. If a high-flow bypass is provided, this step is not needed. If no high-flow bypass is provided, proceed with the procedure below. Flow splitter structure design is described in Appendix G.

- 1) Check the swale size to determine whether the swale can convey the flood control design storm peak flows (Refer to the Ventura County Hydrology Manual, 2006).
- 2) The peak flow velocity of the flood control design storm (e.g., flood control design storm – see Ventura County Hydrology Manual, 2006)) must be less than 3.0 feet per second. If this velocity exceeds 3.0 feet per second, return to Step 2 and

increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.

Sizing Worksheet

Step 1: Determine water quality design flow	
1-1. Enter Project area (acres), $A_{project}$	$A_{design} =$ acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-3. Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p (1-imp)$	$C =$
1-5. Enter design rainfall intensity (in/hr), i	$i =$ in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	$SQDF =$ cfs
Step 2: Calculate swale bottom width	
2-1. Enter water quality design flow (cfs), $SQDF$	$SQDF =$ cfs
2-2. Enter Manning's roughness coefficient for shallow flow conditions, $n_{wq} = 0.2$	$n_{wq} =$
2-3. Calculate design flow depth (ft), y	$y =$ ft
2-4. Enter longitudinal slope (ft/ft) (along direction of flow), s	$s =$ ft/ft
2-5. Calculate bottom width of swale (ft), $b = (SQDF*n_{wq})/(1.49y^{0.67}s^{0.5})$	$b =$ ft
2-6. If b is between 2 and 10 feet, go to Step 3	
2-7. If b is less than 2 ft, assume $b = 2$ ft and recalculate flow depth, $y = ((SQDF*n_{wq})/(2.98 s^{0.5}))^{1.49}$	$y =$ ft

<p>2-8. If b is greater than 10 ft, one of the following design adjustments must be made (recalculate variables as necessary):</p> <ul style="list-style-type: none"> • Increase the longitudinal slope to a maximum of 0.06 ft/ft. • Increase the design flow depth to a maximum of 4 in (0.33 ft). • Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet). Swale width can be increased to an absolute maximum of 16 feet if a divider is provided. 	
Step 3: Determine design flow velocity	
<p>3-1. Enter side slope length per unit height (H:V) (e.g. 3 if side slopes are 3H :1V), Z</p>	$Z =$
<p>3-2. Enter bottom width of swale (ft), b</p>	$b =$ ft
<p>3-3. Enter design flow depth (ft), y</p>	$y =$ ft
<p>3-4. Calculate the cross-sectional area of flow at design depth (ft²),</p> $A_{wq} = by + Zy^2$	$A_{wq} =$ ft ²
<p>3-5. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$</p>	$V_{wq} =$ ft/s
<p>3-6. If the design flow velocity exceeds 1 ft/s, go back to Step 2 and change one or more of the design parameters to reduce the design flow velocity. If design flow velocity is less than 1 ft/s, proceed to Step 4.</p>	
Step 4: Calculate swale length	
<p>4-1. Enter hydraulic residence time (minutes, minimum 7 min), t_{hr}</p>	$t_{hr} =$ min
<p>4-2. Calculate swale length (ft), $L = 60t_{hr}V_{wq}$</p>	$L =$ ft

Step 4: Calculate swale length	
<p>4-3. If L is too long for the site, proceed to Step 5 to adjust the swale layout</p> <p>If L is greater than 100 ft and will fit within the constraints of the site, skip to Step 6</p> <p>If L is less than 100 ft, increase the length to a minimum of 100 ft, leaving the bottom width unchanged, and skip to Step 6</p>	
Step 5: Adjust swale layout to fit within site constraints	
5-1. Enter the bottom width calculated in Step 2 (ft), $b_i = b$	$b_i =$ ft
5-2. Enter design flow depth (ft), y	$y =$ ft
5-3. Enter the swale side slope ratio (H:V), Z	$Z =$ ft:ft
5-4. Enter the additional top width above the side slope for the design water depth (ft), $b_{slope} = 2Zy$	$b_{slope} =$ ft
5-5. Enter the initial length calculated in Step 4 (ft), $L_i = L$	$L_i =$ ft
5-6. Calculate the top area at the design treatment depth (ft ²), $A_{top} = (b_i + b_{slope}) \times L_i$	$A_{top} =$ ft ²
5-7. Choose a reduced swale length based on site constraints (ft), L_f	$L_f =$ ft
5-8. Calculate the increased bottom width (ft), $b_f = (A_{top}/L_f) - b_{slope}$	$b_f =$ ft
5-9. Recalculate the cross-sectional area of flow at design depth (ft ²), $A_{wq,f} = b_f y + Zy^2$	$A_{wq,f} =$ ft ²
5-10. Recalculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$ Revise design as necessary if design flow velocity exceeds 1 ft/s.	$V_{wq} =$ ft/s

<p>5-11. Recalculate the hydraulic residence time (min),</p> $t_{hr} = L_f / (60V_{wq})$ <p>Ensure that t_{hr} is greater or equal to 10 minutes.</p>	<p>$t_{hr} =$ min</p>
<p>5-12. When V_{wq} and t_{hr} are recalculated to meet requirements, proceed to Step 6.</p>	
<p>Step 6: Provide conveyance capacity for flows higher than SQDF (if swale is on-line)</p>	
<p>6-1. If the swale already includes a high-flow bypass to convey flows higher than the water quality design flow rate, skip this step and verify that all parameters meet design requirements to complete sizing</p>	
<p>6-2. If swale does not include a high-flow bypass, determine that the swale can convey flood control design storm peak flows. Calculate the capital peak flow velocity per Ventura County requirements (ft/s), V_p</p>	<p>$V_p =$ ft/s</p>
<p>6-3. If $V_p > 3.0$ feet per second, return to Step 2 and increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.</p>	

Design Example

Step 1: Determine water quality design Flow

For this design example, a 10-acre site with Type 4 soil and 60% total imperviousness is considered. Flow-based sizing Method 1 is assumed. Therefore, the design intensity is 0.2 in/hr.

Step 1: Determine water quality design flow	
1-1. Enter Project area (acres), $A_{project}$	$A = 10$ acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.60$
1-3. Determine pervious runoff coefficient using Table E-1, C_p	$C_p = 0.05$
1-4. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-5. Enter design rainfall intensity (in/hr), i	$i = 0.2$ in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	$SQDF = 1.18$ cfs

Step 2: Calculate Swale Bottom Width

The swale bottom width is calculated based on Manning's equation. The grass height in the swale will be maintained at 6-inches. The design flow depth is assumed to be 2/3 of the grass height, or 4 inches (0.33 ft). The default Manning's roughness coefficient is assumed appropriate for expected vegetation density and design depth. The slope was assumed to be 0.04.

Step 2: Calculate swale bottom width	
2-1. Enter water quality design flow (cfs), $SQDF$	$SQDF = 1.18$ cfs
2-2. Enter Manning's roughness coefficient for shallow flow conditions, $n_{wq} = 0.2$	$n_{wq} = 0.2$
2-3. Calculate design flow depth (ft), y	$y = 0.33$ ft
2-4. Enter longitudinal slope (along direction of flow) (ft/ft), s	$s = 0.04$ ft/ft
2-5. Calculate bottom width of swale (ft),	$b = 5.0$ ft

Step 2: Calculate swale bottom width	
$b = Q_{wq}n_{wq} / 1.49y^{0.67}S^{0.5}$	
2-6. If b is between 2 and 10 feet, go to Step 3	
2-7. If b is less than 2 ft, assume $b = 2$ ft and recalculate flow depth, $y = (Q_{wq}n_{wq} / 2.98S^{0.5})^{1.49}$	Not applicable
2-8. If b is greater than 10 ft, one of the following design adjustments must be made (and recalculate as necessary): Increase the longitudinal slope to a maximum of 0.06 ft/ft. Increase the design flow depth to a maximum of 4 in (0.33 ft). Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet). Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.	Not applicable

Step 3: Determine Design Flow Velocity

For this design example, it is assumed the side slopes will be designed as 3H: 1V, so $Z = 3$.

Step 3: Determine design flow velocity	
3-1. Enter side slope length per unit height (H:V) (e.g. 3 if side slopes are 3H :1V), Z	$Z = 3$
3-2. Enter bottom width of swale (ft), b	$b = 5.0 \text{ ft}$
3-3. Enter design flow depth (ft), y	$y = 0.33 \text{ ft}$
3-4. Calculate the cross-sectional area of flow at design depth (ft ²), $A_{wq} = by + Zy^2$	$A_{wq} = 2.0 \text{ ft}^2$
3-5. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$	$V_{wq} = 0.59 \text{ ft/s}$
3-6. If the design flow exceeds 1 ft/s, go back to Step 2 and change one or more of the design parameters to reduce the design flow velocity. If design flow velocity is less than 1 ft/s, proceed to Step 4.	

Step 4: Calculate Swale Length

Using the design flow velocity and a minimum residence time of 7 minutes, the length of the swale is calculated as follows. The swale length must be a minimum of 100 ft.

Step 4: Calculate swale length	
4-1. Enter hydraulic residence time (min 7 min), t_{hr} (min)	$t_{hr} = 10 \text{ min}$
4-2. Calculate swale length, $L = 60t_{hr}V_{wq}$	$L = 354 \text{ ft}$
4-3. If L is too long for the site, proceed to Step 5 to adjust the swale layout If L is greater than 100 ft and will fit within the constraints of the site, skip to Step 6 If L is less than 100 ft, increase the length to a minimum of 100 ft, leaving the bottom width unchanged, and skip to Step 6	Not Applicable

Site constraints only allow a swale length of 300 feet. Therefore proceed to Step 5 to adjust the swale length.

Step 5: Adjust Swale Layout to Fit Within Site Constraints

To adjust swale length to 300 feet, the bottom width needs to be increased (up to a maximum of 16 ft if a divider is provided).

Step 5: Adjust swale layout to fit within site constraints	
5-1. Enter the bottom width calculated in Step 2 (ft), $b_i = b$	$b_i = 5.0 \text{ ft}$
5-2. Enter design flow depth (ft), y	$y = 0.33 \text{ ft}$
5-3. Enter the swale side slope ratio (H:V), Z	$Z = 3 \text{ ft:ft}$
5-4. Enter the additional top width above the side slope for the design water depth (ft), $b_{slope} = 2Zy$	$b_{slope} = 2 \text{ ft}$
5-5. Enter the initial length calculated in Step 4 (ft), $L_i = L$	$L_i = 354 \text{ ft}$
5-6. Calculate the top area at the design treatment depth (ft ²), $A_{top} = (b_i + b_{slope}) \times L_i$	$A_{top} = 2,480 \text{ ft}^2$

5-7. Choose a reduced swale length based on site constraints (ft), L_f	$L_f = 300 \text{ ft}$
5-8. Calculate the increased bottom width (ft), $b_f = (A_{top}/L_f) - b_{slope}$	$b_f = 6.3 \text{ ft}$
5-9. Recalculate the cross-sectional area of flow at design depth (ft ²), $A_{wq,f} = b_f y + Zy^2$	$A_{wq,f} = 2.4 \text{ ft}^2$
5-10. Recalculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$ Revise design as necessary if design flow velocity exceeds 1 ft/s.	$V_{wq} = 0.49 \text{ ft/s}$
5-11. Recalculate the hydraulic residence time (min), $t_{hr} = L_f / (60V_{wq})$ Ensure that t_{hr} is greater or equal to 10 minutes.	$t_{hr} = 10.2 \text{ min}$
5-12. When V_{wq} and t_{hr} are recalculated to meet requirements, proceed to Step 6.	

Since the new length and width yields V_{wq} and t_{hr} which meet requirements, continue to Step 6.

Step 6: Provide Conveyance Capacity for Flows Higher than SQDF

The swale will be offline such that all flows greater than SQDF will be bypassed.

E.7 VEG-4 Filter Strip

Sizing Methodology

The flow capacity of a vegetated filter strips (filter strips) is a function of the longitudinal slope (parallel to flow), the resistance to flow (e.g., Manning's roughness), and the width and length of the filter strip. The slope shall be small enough to ensure that the depth of water will not exceed 1 inch over the filter strip. Similarly, the flow velocity shall be less than 1 ft/sec. Procedures for sizing filter strips are summarized below. A filter strip sizing example is also provided.

Step 1: Calculate the design flow rate

The design flow is calculated based on the stormwater quality design flow rate, SQDF, as described in [Section E.1](#).

Step 2: Calculate the minimum width

Determine the minimum width (i.e. perpendicular to flow) allowable for the filter strip and design for that width or larger.

$$W_{min} = (SQDF) / (q_{a,min}) \quad \text{(Equation E-35)}$$

Where

- W_{min} = minimum width of filter strip
- $SQDF$ = stormwater quality design flow (cfs)
- $q_{a,min}$ = minimum linear unit application rate, 0.005 cfs/ft

Step 3: Calculate the design flow depth

The design flow depth (d_f) is calculated based on the width and the slope (parallel to the flow path) using a modified Manning's equation as follows:

$$d_f = 12 * [SQDF * n_{wq} / 1.49W_{trib} s^{0.5}]^{0.6} \quad \text{(Equation E-36)}$$

Where:

- d_f = design flow depth (inches)
- $SQDF$ = stormwater quality design flow (cfs)
- W_{trib} = width (perpendicular to flow = width of impervious surface contributing area (ft))
- s = slope (ft/ft) of strip parallel to flow, average over the whole width

n_{wq} = Manning's roughness coefficient (0.25-0.30)

If d_f is greater than 1 inch (0.083 ft), then a shallower slope is required, or a filter strip cannot be used.

Step 4: Calculate the design velocity

The design flow velocity is based on the design flow, design flow depth, and width of the strip:

$$V_{wq} = SQDF / (d_f W_{trib}) \quad \text{(Equation E-37)}$$

Where:

$d_{f,ft}$ = design flow depth (ft) ($d_f/12$)

$SQDF$ = stormwater quality design flow (cfs)

W_{trib} = width (perpendicular to flow = width of impervious surface contributing area (ft))

Step 5: Calculate the desired length of the filter strip

Determine the required length (L) to achieve a desired minimum residence time of 7 minutes using:

$$L = 60t_{hr}V_{wq} \quad \text{(Equation E-38)}$$

Where:

L = minimum allowable strip length (ft)

t_{hr} = hydraulic residence time (s)

V_{wq} = design flow velocity (fps)

Sizing Worksheet

Step 1: Calculate the design flow	
1-1. Enter Project area (acres), $A_{project}$	$A_{design} =$ acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-3. Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p (1-imp)$	$C =$
1-5. Enter design rainfall intensity (in/hr), i	$i =$ in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	$SQDF =$ cfs
Step 2: Calculate the minimum width	
2-1. Enter the stormwater quality design flow (cfs), $SQDF$	$SQDF =$ cfs
2-2. Enter the minimum linear unit application rate (0.005 cfs/ft), $q_{a,min}$	$q_{a,min} =$ cfs/ft
2-3. Calculate the minimum width of filter strip (ft), W_{min}	$W_{min} =$ ft
Step 3: Calculate the design flow depth	
3-1. Enter filter strip longitudinal slope, s (ft/ft)	$s =$ ft/ft
3-2. Enter Manning roughness coefficient (0.25-0.30), n_{wq}	$n_{wq} =$
3-3. Enter width of impervious surface contributing area (perpendicular to flow), W (ft)	$W =$ ft

Step 3: Calculate the design flow depth	
3-4. Calculate average depth of water using Manning equation (inches), $d_f = 12 * [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6}$	$d_f =$ inches
3-5. If $d_f > 1$ " (0.083 ft), go back step 3-1 and decrease the slope	
3-6. If the slope cannot be changed due to construction constraints, go to step 3-3 and increase the width perpendicular to flow.	
Step 4: Calculate the design velocity	
4-1. Enter depth of water (ft), $d_{f,ft} = d_f / 12$	$d_{f,ft} =$ ft
4-2. Enter width of strip (ft), W	$W =$ ft
4-3. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / (d_{f,ft} W)$	$V_{wq} =$ ft/s
4-4. If the $V_{wq} > 1$ ft/s, go back to step 3-1 and decrease the slope.	
Step 5: Calculate the length of the filter strip	
5-1. Enter desired residence time (minimum 7 minutes), t	$t =$ min
5-2. Enter design flow velocity (ft/s), V_{wq}	$V_{wq} =$ ft/s
5-3. Calculate length of the filter strip (ft), $L = 60tV_{wq}$	$L =$ ft
5-4. If $L < 4$ ft, go to step 3-1 and increase the slope	

Design Example

Step 1: Determine water quality design Flow

For this design example, a 10-acre site with Type 4 soil and 60% total imperviousness is considered. Flow-based sizing Method 1 is used, as described in [Section E.1](#).

Step 1: Calculate the design flow	
1-1. Enter Project area (acres), $A_{project}$	$A_{design} = 10$ acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.60$
1-3. Determine pervious runoff coefficient using Table E-1, C_p	$C_p = 0.05$
1-4. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-5. Enter design rainfall intensity (in/hr), i	$i = 0.2$ in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	$SQDF = 1.18$ cfs

Step 2: Calculate the minimum width of filter strip

Determine the minimum width (i.e. perpendicular to flow) allowable for the filter strip and design for that width or larger.

Step 2: Calculate the minimum width	
2-1. Enter the stormwater quality design flow (cfs), $SQDF$	$SQDF = 1.18$ cfs
2-2. Enter the minimum linear unit application rate (0.005 cfs/ft), $q_{a,min}$	$q_{a,min} = 0.005$ cfs/ft
2-3. Calculate the minimum width of filter strip (ft), $W_{min} = SQDF / q_{a,min}$	$W_{min} = 240$ ft

Step 3: Calculate the Design Flow Depth

A slope of 3% was assumed for the filter strip (2-4% recommended). The design water depth should not exceed 1 inch. For this design example a manning's coefficient of 0.27 was used.

Step 3: Calculate the design flow depth	
3-1. Enter filter strip longitudinal slope, s (ft/ft)	$s = 0.03$ ft/ft
3-2. Enter Manning roughness coefficient (0.25-0.30), n_{wq}	$n_{wq} = 0.27$
3-3. Enter width of strip (=impervious surface contributing area perpendicular to flow), at least W_{min} (ft), W	$W = 240$ ft
3-4. Calculate average depth of water using Manning equation (inches), $d_f = 12 * [SQDF * n_{wq} / 1.49 W s^{0.5}]^{0.6}$	$d_f = 0.51$ in
3-5. If $d_f > 1$ " (0.083 ft), go back step 3-1 and decrease the slope	
3-6. If the slope cannot be changed due to construction constraints, go to step 3-3 and increase the width perpendicular to flow.	

Step 4: Calculate the Design Velocity

The designed flow velocity should not exceed 1 foot/second across the filter strip.

Step 4: Calculate the design velocity	
4-1. Enter depth of water (ft), $d_{f,ft} = d_f / 12$	$d_f = 0.043$ ft
4-2. Enter width of strip (ft), W	$W = 240$ ft
4-3. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / (d_{f,ft} W)$	$V_{wq} = 0.11$ ft/s
4-4. If the $V_{wq} > 1$ ft/s, go back to step 3-1 and decrease the slope.	

Step 5: Calculate the Length of the Filter Strip

The filter strip should be at least 4 feet long (in the direction of flow) and accommodate a minimum residence time of 7 minutes to provide adequate water quality treatment.

Step 5: Calculate the length of the filter strip	
5-1. Enter desired residence time (minimum 10 minutes), t	$t = 10 \text{ min}$
5-2. Enter design flow velocity (ft/s), V_{wq}	$V_{wq} = 0.11 \text{ ft/s}$
5-3. Calculate length of the filter strip (ft), $L = 60tV_{wq}$	$L = 66 \text{ ft}$
5-4. If $L < 4 \text{ ft}$, go to step 3-1 and increase the slope	

E.8 TCM-1 Dry Extended Detention Basin

Sizing Methodology

Dry extended detention (ED) basins are basins designed such that the stormwater quality design volume, SQDV, is detained for 36 to 48 hours. This allows sediment particles and associated pollutants to settle and be removed from stormwater. Procedures for sizing extended detention basins are summarized below. A sizing example is also provided.

Step 1: Calculate the design volume

Dry extended detention facilities shall be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Calculate the volume of the active basin

The total basin volume shall be increased an additional 20% of the stormwater quality design volume to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the stormwater quality design volume, SQDV. Freeboard is in addition to the total basin volume. Calculate the volume of the active basin, V_a :

$$V_a = 1.20 * \text{SQDV} \quad (\text{Equation E-39})$$

Step 3: Determine detention basin location and preliminary geometry based on site constraints

Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. The cross-sectional geometry across the width of the basin shall be approximately trapezoidal with a maximum side slope of 4:1 (H:V) on interior slopes and 3:1 (H:V) on exterior slopes unless specifically permitted by Ventura County (see Side Slopes below). Shallower side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

1) Calculate the width of the basin footprint, W_{tot} , as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \quad (\text{Equation E-40})$$

Where:

A_{tot} = total surface area of the basin footprint (ft²)

L_{tot} = total length of the basin footprint (ft)

- 2) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, L_{av-tot} :

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \quad (\text{Equation E-41})$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

- 3) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, W_{av-tot} :

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \quad (\text{Equation E-42})$$

- 4) Calculate the total active volume surface area including the internal berm and excluding freeboard, A_{av-tot} :

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \quad (\text{Equation E-43})$$

- 5) Calculate the area of the berm, A_{berm} :

$$A_{berm} = W_{berm} \times L_{berm} \quad (\text{Equation E-44})$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

- 6) Calculate the surface area excluding the internal berm and freeboard, A_{av} :

$$A_{av} = A_{av-tot} - A_{berm} \quad (\text{Equation E-45})$$

Step 4: Determine Dimensions of Forebay

5-15% of the basin active volume, V_a , is required to be within the active volume of the forebay.

- 1) Calculate the active volume of forebay, V_1 :

$$V_1 = \frac{V_a \times \%V_1}{100} \quad (\text{Equation E-46})$$

Where:

$\%V_1$ = percent of V_a in forebay (%)

V_a = active volume (ft³)

- 2) Calculate the surface area for the active volume of forebay, A_1 :

$$A_1 = \frac{V_1}{d_1} \quad (\text{Equation E-47})$$

Where:

d_1 = average depth for the active volume of forebay (ft)

- 3) Calculate the length of forebay, L_1 :

$$L_1 = \frac{A_1}{W_1} \quad (\text{Equation E-48})$$

Where:

W_1 = width of forebay (ft)

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

- 1) Calculate the active volume of Cell 2, V_2 :

$$V_2 = V_a - V_1 \quad (\text{Equation E-49})$$

Where:

V_a = total basin active volume (ft³)

V_1 = volume of forebay (ft³)

- 2) Calculate the surface area, A_2 , for the active volume of Cell 2:

$$A_2 = A_{av} - A_1 \quad (\text{Equation E-50})$$

Where:

A_{av} = basin surface area excluding berm and freeboard (ft²)

A_1 = surface area of forebay (ft²)

- 3) Calculate the average depth, d_2 , for the active volume of Cell 2:

$$d_2 = \frac{V_2}{A_2} \quad (\text{Equation E-51})$$

- 4) Calculate the length of Cell 2, L_2 :

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation E-52)}$$

Where:

W_2 = width of Cell 2 (ft)

- 5) Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with \geq 2:1 preferred. If the length-to width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen. Calculate the length-to width, LW_{mid2} , ratio of Cell 2 at half of d_2 follows:

$$LW_{mid2} = \frac{L_{mid2}}{W_{mid2}} \quad \text{(Equation E-53)}$$

Where:

$$W_{mid2} = W_2 - Zd_2 \text{ and} \quad \text{(Equation E-54)}$$

$$L_{mid2} = L_2 - Zd_2 \quad \text{(Equation E-55)}$$

W_{mid2} = width of Cell 2 at half of d_2 (ft)

L_{mid2} = length of Cell 2 at half of d_2 (ft)

Z = interior side slope as length per unit height (H:V)

Step 6: Ensure Design Requirements and Site Constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass

the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter Project area (acres), $A_{project}$	$A =$	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	%
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$	
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA =$	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	acres
1-7. Determine pervious runoff coefficient using <u>Table E-1</u> , C_p	$C_p =$	
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C =$	
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i =$	in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P =$	ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV =$	ft ³
Step 2: Calculate the volume of the active basin		
2-1. Calculate basin active volume (includes water quality design volume + sediment storage volume) (ft ³), $V_a = 1.20 * SQDV$	$V_a =$	ft ³

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints		
3-1. Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.		
3-2. Enter the total surface area of the basin footprint based on site constraints (ft ²), A_{tot}	$A_{tot} =$	ft ²
3-3. Enter the length of the basin footprint based on site constraints (ft), L_{tot}	$L_{tot} =$	ft
3-4. Calculate the width of the basin footprint (L:W = 1.5:1 min) (ft), $W_{tot} = A_{tot} / L_{tot}$	$W_{tot} =$	ft
3-5. Enter interior side slope as length per unit height (H:V, min = 3), Z	$Z =$	
3-6. Enter desired freeboard depth (ft), d_{fb} (min: 2 ft on-line; 1 ft offline)	$d_{fb} =$	ft
3-7. Calculate the length of the active volume surface area including the internal berm but excluding freeboard, $L_{av-tot} = L_{tot} - 2Zd_{fb}$	$L_{av-tot} =$	ft
3-8. Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av-tot} = W_{tot} - 2Zd_{fb}$	$W_{av-tot} =$	ft
3-9. Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av-tot} = L_{av-tot} \times W_{av-tot}$	$A_{av-tot} =$	ft ²
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	$W_{berm} =$	ft
3-11. Enter the length of the internal berm (ft), $L_{berm} = W_{av-tot}$	$L_{berm} =$	ft
3-12. Calculate the area of the berm (ft ²), $A_{berm} = W_{berm} \times L_{berm}$	$A_{berm} =$	ft ²
3-13. Calculate the surface area excluding the internal berm and freeboard (ft ²), $A_{av} = A_{av-tot} - A_{berm}$	$A_{av} =$	ft ²

Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-15% required), $\%V_1$	$\%V_1 =$ %
4-2. Calculate the active volume of forebay, $V_1 = (V_a \cdot \%V_1)/100$	$V_1 =$ ft ³
4-3. Enter a desired average depth for the active volume of forebay, d_1	$d_1 =$ ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	$A_1 =$ ft ²
4-5. Enter the width of forebay, $W_1 = W_{av-tot} = L_{berm}$	$W_1 =$ ft
4-6. Calculate the length of forebay (<u>Note</u> : inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W_1$	$L_1 =$ ft
Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	$V_2 =$ ft ³
5-2. Calculate the surface area of the active volume of Cell 2, $A_2 = A_{av} - A_1$	$A_2 =$ ft ²
5-3. Calculate the average depth for the active volume of Cell 2, $d_2 = V_2 / A_2$	$d_2 =$ ft
5-4. Enter the width of Cell 2, $W_2 = W_1 = W_{av-tot} = L_{berm}$	$W_2 =$ ft
5-5. Calculate the length of Cell 2, $L_2 = A_2 / W_2$	$L_2 =$ ft
5-6. Calculate the width of Cell 2 at half of d_2 , $W_{mid2} = W_2 - Zd_2$	$W_{mid2} =$ ft
5-7. Calculate the length of Cell 2 at half of d_2 , $L_{mid2} = L_2 - Zd_2$	$L_{mid2} =$ ft

<p>5-8. Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen, $LW_{mid2} = L_{mid2} / W_{mid2}$</p>	<p>$LW_{mid2} =$</p>
<p>Step 6: Ensure Design Requirements and Site Constraints are Achieved</p>	
<p>6-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.</p>	
<p>Step 7: Size Outlet Structure</p>	
<p>7-1. The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.</p>	
<p>Step 8: Determine Emergency Spillway Requirements</p>	
<p>8-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.</p>	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A = 10$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 0.5$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA = 6$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 5.5$ acres
1-7. Determine pervious runoff coefficient using Table E-1 , C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i = 0.75$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P = 0.06$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV = 8,500$ ft ³

Step 2: Calculate Volume of the Active Basin and the Forebay Basin

Step 2: Calculate the design volume of the active basin	
2-1. Calculate basin active design volume (includes water quality design volume + sediment storage volume), $V_a = 1.20 * SQDV$	$V_a = 10,000 \text{ ft}^3$

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints

The detention basin in this example has an internal berm separating the forebay (Cell 1) and the main basin (Cell 2). The internal berm elevation is 2 ft below the elevation of the SUSMP volume within the entire basin. The berm length is equal to the width of the basin when filled to the active design volume.

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the basin footprint based on site constraints, A_{tot}	$A_{tot} = 8,000 \text{ ft}^2$
3-3. Enter the length of the basin footprint based on site constraints, L_{tot} (L:W = 1.5:1 min)	$L_{tot} = 200 \text{ ft}$
3-4. Calculate the width of the basin footprint, $W_{tot} = A_{tot} / L_{tot}$	$W_{tot} = 40 \text{ ft}$
3-5. Enter interior side slope as length per unit height (min = 3), Z	$Z = 3$
3-6. Enter desired freeboard depth, d_{fb} (min: 2 ft on-line; 1 ft offline)	$d_{fb} = 2 \text{ ft}$
3-7. Calculate the length of the active volume surface area including the internal berm but excluding freeboard, $L_{av-tot} = L_{tot} - 2Zd_{fb}$	$L_{av-tot} = 188 \text{ ft}$

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-8. Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av-tot} = W_{tot} - 2Zd_{fb}$	$W_{av-tot} = 28 \text{ ft}$
3-9. Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av-tot} = L_{av-tot} \cdot W_{av-tot}$	$A_{av-tot} = 5,300 \text{ ft}^2$
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	$W_{berm} = 6 \text{ ft}$
3-11. Enter the length of the internal berm, $L_{berm} = W_{av-tot}$	$L_{berm} = 28 \text{ ft}$
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \cdot L_{berm}$	$A_{berm} = 170 \text{ ft}^2$
3-13. Calculate the surface area excluding the internal berm and freeboard, $A_{av} = A_{av-tot} - A_{berm}$	$A_{av} = 5,130 \text{ ft}^2$

Step 4: Calculate Dimensions of Cell 1

Calculate the dimensions of the forebay (Cell 1) based on the active design volume for Cell 1 (25% of V_a) and a desired average depth, d_1 . The width of the forebay, W_1 , is equivalent to the length of the berm, L_{berm} , and the width of Cell 2, W_2 .

Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-15% required), $\%V_1$	$\%V_1 = 25 \%$
4-2. Calculate the active volume of forebay (including sediment storage), $V_1 = (V_a \cdot \%V_1)/100$	$V_1 = 2,500 \text{ ft}^3$
4-3. Enter a desired average depth for the active volume of forebay, d_1	$d_1 = 5 \text{ ft}$
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	$A_1 = 500 \text{ ft}^2$

4-5. Enter the width of forebay, $W_1 = W_{wq-tot} = L_{berm}$	$W_1 =$ 28 ft
4-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W_1$	$L_1 =$ 18 ft

Step 5: Calculate the Dimensions of Cell 2

Calculate the dimensions of the main basin (Cell 2) based on the active design volume for Cell 2 and a desired average depth, d_2 . A calculation of the length, L_{mid2} , and width, W_{mid2} , at half basin depth, d_2 , is conducted in order to verify that the length-to-width ratio at half d_2 is greater than 1.5:1.

Step 5: Calculate the dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	$V_2 =$ 7,500 ft ³
5-2. Calculate the surface area of the active volume of Cell 2, $A_2 = A_{av} - A_1$	$A_2 =$ 4,630 ft ²
5-3. Calculate the average depth of the active volume of Cell 2, $d_2 = V_2 / A_2$	$d_2 =$ 1.6 ft
5-4. Enter the width of Cell 2, $W_2 = W_1 = W_{av-tot} = L_{berm}$	$W_2 =$ 28 ft
5-5. Calculate the length of Cell 2, $L_2 = A_2 / W_2$	$L_2 =$ 166 ft
5-6. Calculate the width of Cell 2 at half of d_2 , $W_{mid2} = W_2 - Zd_2$	$W_{mid2} =$ 23 ft
5-7. Calculate the length of Cell 2 at half of d_2 , $L_{mid2} = L_2 - Zd_2$	$L_{mid2} =$ 161 ft
5-8. Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen, $LW_{mid2} = L_{mid2} / W_{mid2}$	$LW_{mid2} =$ 7

Step 6: Ensure Design Requirements and Site Constraints are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or an alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

E.9 TCM-2 Wet Detention Basin

Sizing Methodology

Wet Detention basins may be designed with or without extended detention above the permanent pool. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [VEG-5: Dry Extended Detention Basin](#)). If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool, the sizing is dependent of the functionality of the basin; the basin may function as water quality treatment only or water quality plus peak flow attenuation.

If and the basin is designed for water quality treatment only, then the permanent pool volume shall be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) shall make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume, and the surcharge volume shall be sized to attenuate peak flows in order to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [VEG-5: Dry Extended Detention Basin](#)).

Step 1: Calculate the design volume

Wet detention basins shall be sized with a permanent pool volume equal to the SQDV volume (see [Section 2](#) and Appendix E).

Step 2: Determine the active design volume for the wet detention basin without extended detention

The active volume of the wet detention basin, V_a , shall be equal to the SQFV plus an additional 5% for sediment accumulation.

$$V_a = 1.05 \times SQDV \quad \text{(Equation E-56)}$$

Step 3: Determine pond location and preliminary geometry based on site constraints

Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. Note that a more natural geometry may be used and is in many cases recommended; the preliminary basin geometry calculations should be used for sizing purposes only.

- 1) Calculate the width of the pond footprint, W_{tot} , as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \quad \text{(Equation E-57)}$$

Where:

A_{tot} = total surface area of the pond footprint (ft²)

L_{tot} = total length of the pond footprint (ft)

- 7) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, L_{av-tot} :

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \quad \text{(Equation E-58)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

- 8) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, W_{av-tot} :

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \quad \text{(Equation E-59)}$$

- 9) Calculate the total active volume surface area including the internal berm and excluding freeboard, A_{av-tot} :

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \quad \text{(Equation E-60)}$$

- 10) Calculate the area of the berm, A_{berm} :

$$A_{berm} = W_{berm} \times L_{berm} \quad \text{(Equation E-61)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

- 11) Calculate the active volume surface area excluding the internal berm and freeboard, A_{wq} :

$$A_{wq} = A_{wq-tot} - A_{berm} \quad \text{(Equation E-62)}$$

Step 4: Determine Dimensions of Forebay

The wet detention basin shall be divided into two cells separated by a berm or baffle. The forebay shall contain between 5 and 10 percent of the total volume. The berm or

baffle volume shall not count as part of the total volume. Calculate the active volume of forebay, V_1 :

$$V_1 = \frac{V_a \times \%V_1}{100} \quad (\text{Equation E-63})$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

- 1) Calculate the surface area for the active volume of forebay, A_1 :

$$A_1 = \frac{V_1}{d_1} \quad (\text{Equation E-64})$$

Where:

d_1 = average depth for the active volume of forebay (ft)

- 2) Calculate the length of forebay, L_1 . Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \quad (\text{Equation E-65})$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av-tot} = L_{berm}$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

- 3) Calculate the active volume of Cell 2, V_2 :

$$V_2 = V_a - V_1 \quad (\text{Equation E-66})$$

- 4) The minimum wetpool surface area includes 0.3 acres of wetpool per acre-foot of permanent wetpool volume. Calculate A_{min2} :

$$A_{min2} = (V_2 \times 0.3 \frac{\text{acres}}{\text{acre-foot}}) \quad (\text{Equation E-67})$$

- 5) Calculate the actual wetpool surface area, A_2 :

$$A_2 = A_{av} - A_1 \quad (\text{Equation E-68})$$

Verify that A_2 is greater than A_{min2} . If A_2 is less than A_{min2} , then modify input parameters to increase A_2 until it is greater than A_{min2} . If site constraints limit this criterion, then another site for the pond should be chosen.

- 6) Calculate the top length of Cell 2, L_2 :

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation E-69)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq-tot} = L_{berm}$

- 7) Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \quad \text{(Equation E-70)}$$

- 8) Calculate the emergent vegetation surface area, A_{ev} :

$$A_{ev} = \frac{A_2 \cdot \%A_{ev}}{100} \quad \text{(Equation E-71)}$$

Where:

$\%A_{ev}$ = percent of surface area that will be planted with emergent vegetation

- 9) Calculate the volume of the emergent vegetation shallow zone (1.5 – 3 ft), V_{ev} :

$$V_{ev} = A_{ev} \cdot d_{ev} \quad \text{(Equation E-72)}$$

Where:

d_{ev} = average depth of the emergent vegetation shallow zone (1.5 – 3 ft)

- 10) Calculate the length of the emergent vegetation shallow zone, L_{ev} :

$$L_{ev} = \frac{A_{ev}}{W_{ev}} \quad \text{(Equation E-73)}$$

Where:

W_{ev} = width of the emergent vegetation shallow zone (ft), $W_{ev} = W_2$

- 11) Calculate the volume of the deep zone, V_{deep} :

$$V_{deep} = V_2 - V_{ev} \quad \text{(Equation E-74)}$$

- 12) Calculate the surface area of the deep (>3 ft) zone, A_{deep} :

$$A_{deep} = A_2 - A_{ev} \quad (\text{Equation E-75})$$

13) Calculate the average depth of the deep zone (4-8 ft), d_{deep} :

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \quad (\text{Equation E-76})$$

14) Calculate length of the deep zone, L_{deep} :

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \quad (\text{Equation E-77})$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 6: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

For extended detention wet detention basin, outlet structures shall be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter drainage area, A	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	%
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	
1-5. Determine the Project Total Impervious area, $TIA = A_{project} * Imp$	TIA =	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	C =	
1-9. Enter design rainfall depth of the storm, P_i (in)	$P_i =$	in
1-10. Calculate rainfall depth, $P = P_i / 12$	P =	ft
1-11. Calculate water quality design volume, $SQDV = 43560 * P * A_{retain} * C$	SQDV =	ft ³
Step 2: Determine active design volume for the wet pond without extended detention		
2-1. Calculate the active design volume (without extended detention), $V_a = 1.05 * SQDV$	$V_a =$	ft ³

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the pond footprint based on site constraints, A_{tot}	$A_{tot} =$ ft ²
3-3. Enter the length of the pond footprint based on site constraints, L_{tot}	$L_{tot} =$ ft
3-4. Calculate the width of the pond footprint, $W_{tot} = A_{tot} / L_{tot}$	$W_{tot} =$ ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	$Z =$
3-6. Enter desired freeboard depth, d_{fb} (1 ft min)	$d_{fb} =$ ft
3-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{av-tot} = L_{tot} - 2Zd_{fb}$	$L_{av-tot} =$ ft
3-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{av-tot} = W_{tot} - 2Zd_{fb}$	$W_{av-tot} =$ ft
3-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{av-tot} = L_{av-tot} \cdot W_{av-tot}$	$A_{av-tot} =$ ft ²
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	$W_{berm} =$ ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av-tot}$	$L_{berm} =$ ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \cdot L_{berm}$	$A_{berm} =$ ft ²

3-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{av} = A_{av-tot} - A_{berm}$	$A_{av} =$ ft^2
Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-10% required), $\%V_1$	$\%V_1 =$ $\%$
4-2. Calculate the active volume of forebay (includes sediment storage volume), $V_1 = (V_a \cdot \%V_1) / 100$	$V_1 =$ ft^3
4-3. Enter desired average depth of forebay (5-9 ft including sediment storage of 1 ft), d_1	$d_1 =$ ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	$A_1 =$ ft^2
4-5. Enter the width of forebay, $W_1 = W_{av-tot} = L_{berm}$	$W_1 =$ ft
4-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W_1$	$L_1 =$ ft
Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	$V_2 =$ ft^3
5-2. Determine minimum wetpool surface area, $A_{min2} = V_2 \cdot 0.3$	$A_{min2} =$ ft^2
5-3. Determine actual wetpool surface area, $A_2 = A_{av} - A_1$	$A_2 =$ ft^2
5-4. <ul style="list-style-type: none"> • If A_2 is greater than A_{min2} then move on to step 5-5. • If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen. 	
5-5. Enter width of Cell 2, $W_2 = W_1 = W_{av-tot} = L_{berm}$	$W_2 =$ ft

5-6. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	$L_2 =$ ft
5-7. Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	$LW_2 =$
5-8. Enter percent of surface area that will be planted with emergent vegetation (25-75%), $\%A_{ev}$	$\%A_{ev} =$ %
5-9. Calculate emergent vegetation surface area, $A_{ev} = (A_2 \cdot \%A_{ev}) / 100$	$A_{ev} =$ ft ²
5-10. Enter average depth of emergent vegetation shallow zone (1.5 – 3 ft), d_{ev}	$d_{ev} =$ ft
5-11. Calculate volume of emergent vegetation shallow zone (1.5 – 3 ft), $V_{ev} = A_{ev} \cdot d_{ev}$	$V_{ev} =$ ft ³
5-12. Enter width of emergent vegetation shallow zone, $W_{ev} = W_2$	$W_{ev} =$ ft
5-13. Calculate length of emergent vegetation shallow zone, $L_{ev} = A_{ev} / W_{ev}$	$L_{ev} =$ ft
5-14. Calculate volume of deep zone, $V_{deep} = V_2 - V_{ev}$	$V_{deep} =$ ft ³
5-15. Calculate surface area of deep (>3 ft) zone, $A_{deep} = A_2 - A_{ev}$	$A_{deep} =$ ft ²
5-16. Calculate average depth of deep zone (4 - 8 ft), $d_{deep} = V_{deep} / A_{deep}$	$d_{deep} =$ ft
5-17. Enter width of deep zone, $W_{deep} = W_2$	$W_{deep} =$ ft
5-18. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deep}$	$L_{deep} =$ ft

Step 6: Ensure Design Requirements and Site Constraints are Achieved

6-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

7-1. The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

8-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Design Example

Wet detention basin siting requires the following considerations prior to construction: (1) availability of base flow – wet detention basins require a regular source of water if water level is to be maintained, (2) surface space availability – large footprint area is required, and (3) compatibility with flood control – basins must not interfere with flood control functions of existing conveyance and detention structures.

The wet detention basin in this example does not have extended detention. An internal berm separates the forebay (Cell 1) and the main basin (Cell 2). The berm is at the elevation of the active volume design surface which is also the permanent wetpool elevation.

Step 1: Determine Water Quality Design Volume

For this design example, a 20-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume	
1-1. Enter drainage area, A	A = 20 acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 1.0$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area, $TIA = A_{project} * Imp$	$TIA = 12$ acres
1-6. Determine the total area from which runoff must be retained, $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 11$ acres
1-7. Determine pervious runoff coefficient using Table E-1 , C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm, P_i (in)	$P_i = 0.75$ in
1-10. Calculate rainfall depth, $P = P_i / 12$	$P = 0.06$ ft

1-11. Calculate water quality design volume, $SQDV = 43560 \cdot P \cdot A_{retain} \cdot C$	$SQDV = 17,000 \text{ ft}^3$
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Step 2: Determine Active Design Volume for a Wet Detention Basin without Extended Detention

If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the water quality design volume plus an additional 5% for sediment accumulation.

Step 2: Determine Active Design Volume for a Wet Detention Basin without Extended Detention	
2-1. Calculate the active design volume (without extended detention), $V_a = 1.05 \cdot SQDV$	$V_a = 17,800 \text{ ft}^3$

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints

A total footprint area and total length available for the basin is provided. This step calculates the total active volume surface area which is equivalent to the permanent wetpool surface area. This step also calculates the dimensions of the internal berm.

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the pond footprint based on site constraints, A_{tot}	$A_{tot} = 7,500 \text{ ft}^2$
3-3. Enter the length of the pond footprint based on site constraints, L_{tot}	$L_{tot} = 150 \text{ ft}$
3-4. Calculate the width of the pond footprint, $W_{tot} = A_{tot} / L_{tot}$	$W_{tot} = 50 \text{ ft}$
3-5. Enter interior side slope as length per unit height (min = 3), Z	$Z = 3$

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-6. Enter desired freeboard depth, d_{fb} (1 ft min)	$d_{fb} = 2 \text{ ft}$
3-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{av-tot} = L_{tot} - 2Zd_{fb}$	$L_{av-tot} = 138 \text{ ft}$
3-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{av-tot} = W_{tot} - 2Zd_{fb}$	$W_{av-tot} = 38 \text{ ft}$
3-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{av-tot} = L_{av-tot} \cdot W_{av-tot}$	$A_{av-tot} = 4,940 \text{ ft}^2$
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	$W_{berm} = 6 \text{ ft}$
3-11. Enter the length of the internal berm, $L_{berm} = W_{av-tot}$	$L_{berm} = 38 \text{ ft}$
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \cdot L_{berm}$	$A_{berm} = 230 \text{ ft}^2$
3-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{av} = A_{av-tot} - A_{berm}$	$A_{av} = 4,710 \text{ ft}^2$

Step 4: Determine Dimensions of forebay

It should be assumed that the forebay should be 5-10% of the total active design volume, V_a .

Step 4: Determine Dimensions of Cell 1	
4-1. Enter the percent of V_a in forebay (5-10% required), $\%V_1$	$\%V_1 = 20 \%$
4-2. Calculate the active volume of forebay (includes sediment storage volume), $V_1 = (V_a \cdot \%V_1) / 100$	$V_1 = 3,560 \text{ ft}^3$
4-3. Enter desired average depth of forebay (5-9 ft including sediment storage of 1 ft), d_1	$d_1 = 8 \text{ ft}$

4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	$A_1 =$ 440 ft ²
4-5. Enter the width of forebay, $W_1 = W_{av-tot} = L_{berm}$	$W_1 =$ 38 ft
4-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W_1$	$L_1 =$ 12 ft

Step 5: Determine Dimensions of Cell 2

Verify that the surface area and length-to-width ratio of Cell 2 meet the design criteria. Calculate volumes, depths and surface areas for the emergent vegetation shallow zone and the deep zone.

Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	$V_2 =$ 14,200 ft ³
5-2. Determine minimum wetpool surface area, $A_{min2} = V_2 \cdot 0.3$	$A_{min2} =$ 4,270 ft ²
5-3. Determine actual wetpool surface area, $A_2 = A_{av} - A_1$	$A_2 =$ 4,270 ft ²
5-4. If A_2 is greater than A_{min2} then move on to step 5-5. If A_2 is less than A_{min2} , then modify input parameters to increase A_2 until it is greater than A_{min2} . If site constraints limit this criterion, then another site for the pond should be chosen.	
5-5. Enter width of Cell 2, $W_2 = W_1 = W_{av-tot} = L_{berm}$	$W_2 =$ 38 ft
5-6. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	$L_2 =$ 110 ft
5-7. Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with $\geq 2:1$ preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	$LW_2 =$ 2.9
5-8. Enter percent of surface area that will be planted with emergent vegetation (25-75%), $\%A_{ev}$	$\%A_{ev} =$ 25 %

Step 5: Determine Dimensions of Cell 2	
5-9. Calculate emergent vegetation surface area, $A_{ev} = (A_2 \cdot \%A_{ev})/100$	$A_{ev} = 1,070 \text{ ft}^2$
5-10. Enter average depth of emergent vegetation shallow zone (1.5 – 3 ft), d_{ev}	$d_{ev} = 2 \text{ ft}$
5-11. Calculate volume of emergent vegetation shallow zone (1.5 – 3 ft), $V_{ev} = A_{ev} \cdot d_{ev}$	$V_{ev} = 2,130 \text{ ft}^3$
5-12. Enter width of emergent vegetation shallow zone, $W_{ev} = W_2$	$W_{ev} = 38 \text{ ft}$
5-13. Calculate length of emergent vegetation shallow zone, $L_{ev} = A_{ev} / W_{ev}$	$L_{ev} = 56 \text{ ft}$
5-14. Calculate volume of deep zone, $V_{deep} = V_2 - V_{ev}$	$V_{deep} = 13,100 \text{ ft}^3$
5-15. Calculate surface area of deep (>3 ft) zone, $A_{deep} = A_2 - A_{ev}$	$A_{deep} = 3,200 \text{ ft}^2$
5-16. Calculate average depth of deep zone (4 - 8 ft), $d_{deep} = V_{deep} / A_{deep}$	$d_{deep} = 4.1 \text{ ft}$
5-17. Enter width of deep zone, $W_{deep} = W_2$	$W_{deep} = 28 \text{ ft}$
5-18. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deep}$	$L_{deep} = 114 \text{ ft}$

Step 6: Ensure Design Requirements and Site Conditions are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of

the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

E.10 TCM-3 Constructed Wetland

Sizing Methodology

In most cases, the constructed treatment wetland permanent pool shall be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume shall be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) shall make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume and the surcharge volume shall be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see [VEG-5: Dry Extended Detention Basin](#)).

Step 1: Calculate the design volume

Constructed wetlands shall be sized to be greater than or equal to the SQDV volume (see [Section 2](#) and Appendix E).

Step 2: Determine the Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints

Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. The equations provided below assume a trapezoidal geometry for cell 1 (Forebay) and cell 2, and assumes that the wetland does not have extended detention.

- 1) Calculate the width of the wetland footprint, W_{tot} , as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \quad \text{(Equation E-78)}$$

Where:

A_{tot} = total surface area of the wetland footprint (ft²)

L_{tot} = total length of the wetland footprint (ft)

- 12) Calculate the length of the water quality volume surface area including the internal berm but excluding the freeboard, L_{wq-tot} :

$$L_{wq-tot} = L_{tot} - 2Zd_{fb} \quad \text{(Equation E-79)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

- 13) Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, W_{wq-tot} :

$$W_{wq-tot} = W_{tot} - 2Zd_{fb} \quad (\text{Equation E-80})$$

- 14) Calculate the total water quality volume surface area including the internal berm and excluding freeboard, A_{wq-tot} :

$$A_{wq-tot} = L_{wq-tot} \times W_{wq-tot} \quad (\text{Equation E-81})$$

- 15) Calculate the area of the berm, A_{berm} :

$$A_{berm} = W_{berm} \times L_{berm} \quad (\text{Equation E-82})$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

- 16) Calculate the water quality surface area excluding the internal berm and freeboard, A_{wq} :

$$A_{wq} = A_{wq-tot} - A_{berm} \quad (\text{Equation E-83})$$

Step 3: Determine Dimensions of Forebay

30-50% of the SQDV is required to be within the active volume of forebay.

- 1) Calculate the active volume of forebay, V_1 :

$$V_1 = \frac{SQDV \times \%V_1}{100} \quad (\text{Equation E-84})$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

- 2) Calculate the surface area for the active volume of forebay, A_1 :

$$A_1 = \frac{V_1}{d_1} \quad (\text{Equation E-85})$$

Where:

d_1 = average depth for the active volume of forebay (2 -4 ft) (ft)

- 3) Calculate the length of forebay, L_1 . Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \quad \text{(Equation E-86)}$$

Where:

$$W_1 = \text{width of forebay (ft), } W_1 = W_{av-tot} = L_{berm}$$

Step 4: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

- 1) Calculate the active volume of Cell 2, V_2 :

$$V_2 = SQDV - V_1 \quad \text{(Equation E-87)}$$

- 2) Calculate the surface area of Cell 2, A_2 :

$$A_2 = A_{wq} - A_1 \quad \text{(Equation E-88)}$$

- 3) Calculate the top length of Cell 2, L_2 :

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation E-89)}$$

Where:

$$W_2 = \text{width of Cell 2 (ft), } W_2 = W_1 = W_{wq-tot} = L_{berm}$$

- 4) Verify that the length-to-width ratio of Cell 2, LW_2 , is at least 3:1 with $\geq 4:1$ preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \quad \text{(Equation E-90)}$$

- 5) Calculate the very shallow zone surface area, A_{vs} :

$$A_{vs} = \frac{A_2 \cdot \%A_{vs}}{100} \quad \text{(Equation E-91)}$$

Where:

$$\%A_{vs} = \text{percent of surface area of very shallow zone}$$

- 6) Calculate the volume of the shallow zone, V_{vs} :

$$V_{vs} = A_{vs} \bullet d_{vs} \quad \text{(Equation E-92)}$$

Where:

d_{vs} = average depth of the very shallow zone (0.1 – 1 ft)

7) Calculate the length of the very shallow zone, L_{vs} :

$$L_{vs} = \frac{A_{vs}}{W_{vs}} \quad \text{(Equation E-93)}$$

Where:

W_{vs} = width of the very shallow zone (ft), $W_{vs} = W_2$

8) Calculate the surface area of the shallow zone, A_s :

$$A_s = \frac{A_2 \bullet \% A_s}{100} \quad \text{(Equation E-94)}$$

Where:

$\%A_s$ = percent of surface area of shallow zone

9) Calculate the volume of the shallow zone, V_s :

$$V_s = A_s \bullet d_s \quad \text{(Equation E-95)}$$

Where:

d_s = average depth of shallow zone (1 - 3 ft)

10) Calculate length of the shallow zone, L_s :

$$L_s = \frac{A_s}{W_s} \quad \text{(Equation E-96)}$$

Where:

W_s = width of the shallow zone (ft), $W_s = W_2$

11) Calculate the surface area of the deep zone, A_{deep} :

$$A_{deep} = A_2 - A_{vs} - A_s \quad \text{(Equation E-97)}$$

12) Calculate the volume of the deep zone, V_{deep} :

$$V_{deep} = V_2 - V_{vs} - V_s \quad \text{(Equation E-98)}$$

13) Calculate the average depth of the deep zone (3-5 ft), d_{deep} :

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \quad \text{(Equation E-99)}$$

14) Calculate length of the deep zone, L_{deep} :

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \quad \text{(Equation E-100)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 5: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 6: Size Outlet Structure

For wetlands with detention, the outlet structures shall be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter drainage area, A	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	%
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	
1-5. Determine the Project Total Impervious area, $TIA = A_{project} * Imp$	TIA =	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	C =	
1-9. Enter design rainfall depth of the storm, P_i (in)	$P_i =$	in
1-10. Calculate rainfall depth, $P = P_i / 12$	P =	ft
1-11. Calculate water quality design volume, $SQDV = 43560 * P * A_{retain} * C$	SQDV =	ft ³
Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints		
2-1. Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2. The wetland does not have extended detention.		

2-2. Enter the total surface area of the wetland footprint based on site constraints, A_{tot}	$A_{tot} =$ ft ²
2-3. Enter the length of the wetland footprint based on site constraints, L_{tot}	$L_{tot} =$ ft
2-4. Calculate the width of the wetland footprint, $W_{tot} = A_{tot} / L_{tot}$	$W_{tot} =$ ft
2-5. Enter interior side slope as length per unit height (min = 3), Z	$Z =$
2-6. Enter desired freeboard depth, d_{fb}	$d_{fb} =$ ft
2-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{wq-tot} = L_{tot} - 2Zd_{fb}$	$L_{wq-tot} =$ ft
2-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq-tot} = W_{tot} - 2Zd_{fb}$	$W_{wq-tot} =$ ft
2-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq-tot} = L_{wq-tot} \cdot W_{wq-tot}$	$A_{wq-tot} =$ ft ²
2-10. Enter the width of the internal berm (6 ft min), W_{berm}	$W_{berm} =$ ft
2-11. Enter the length of the internal berm, $L_{berm} = W_{wq-tot}$	$L_{berm} =$ ft
2-12. Calculate the area of the berm, $A_{berm} = W_{berm} \cdot L_{berm}$	$A_{berm} =$ ft ²
2-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{wq} = A_{wq-tot} - A_{berm}$	$A_{wq} =$ ft ²
Step 3: Determine Dimensions of forebay	
3-1. Enter the percent of SQDV in forebay (30-50% required), $\%V_1$	$\%V_1 =$ %
3-2. Calculate the active volume of forebay (includes water quality volume + sediment storage volume),	$V_1 =$ ft ³

$V_1 = (\text{SQDV} \cdot \%V_1) / 100$	
3-3. Enter desired average depth of forebay ₁ (2-4 ft including sediment storage of 1 ft), d_1	$d_1 =$ ft
3-4. Calculate the surface area for the water quality volume of forebay, $A_1 = V_1 / d_1$	$A_1 =$ ft ²
3-5. Enter the width of forebay, $W_1 = W_{\text{av-tot}} = L_{\text{berm}}$	$W_1 =$ ft
3-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W_1$	$L_1 =$ ft
Step 4: Determine Dimensions of Cell 2	
4-1. Calculate the active volume of Cell 2, $V_2 = \text{SQDV} - V_1$	$V_2 =$ ft ³
4-2. Calculate surface area of Cell 2, $A_2 = A_{\text{wq}} - A_1$	$A_2 =$ ft ²
4-3. Enter width of Cell 2, $W_2 = W_1 = W_{\text{wq-tot}} = L_{\text{berm}}$	$W_2 =$ ft
4-4. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	$L_2 =$ ft
4-5. Verify that the length-to-width ratio of Cell 2 is at least 3:1 with $\geq 4:1$ preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	$LW_2 =$
4-6. Enter percent of surface area of very shallow zone, $\%A_{\text{vs}}$	$\%A_{\text{vs}} =$ %
4-7. Calculate very shallow zone surface area, $A_{\text{vs}} = (A_2 \cdot \%A_{\text{vs}}) / 100$	$A_{\text{vs}} =$ ft ²
4-8. Enter average depth of very shallow zone (0.1 - 1 ft), d_{vs}	$d_{\text{vs}} =$ ft
4-9. Calculate volume of very shallow zone, $V_{\text{vs}} = A_{\text{vs}} \cdot d_{\text{vs}}$	$V_{\text{vs}} =$ ft ³
4-10. Enter width of very shallow zone, $W_{\text{vs}} = W_2$	$W_{\text{vs}} =$ ft

4-11. Calculate length of very shallow zone, $L_{vs} = A_{vs} / W_{vs}$	$L_{vs} =$ ft
4-12. Enter percent of surface area of shallow zone, $\%A_s$	$\%A_s =$ %
4-13. Calculate surface area of shallow zone, $A_s = (A_2 \cdot \%A_s)/100$	$A_s =$ ft ²
4-14. Enter average depth of shallow zone (1 - 3 ft), d_s	$d_s =$ ft
4-15. Calculate volume of shallow zone, $V_s = A_s \cdot d_s$	$V_s =$ ft ³
4-16. Enter width of shallow zone, $W_s = W_2$	$W_s =$ ft
4-17. Calculate length of shallow zone, $L_s = A_s / W_s$	$L_s =$ ft
4-18. Calculate surface area of deep zone, $A_{deep} = A_2 - A_{vs} - A_s$	$A_{deep} =$ ft ²
4-19. Calculate volume of deep zone, $V_{deep} = V_2 - V_{vs} - V_s$	$V_{deep} =$ ft ³
4-20. Calculate average depth of deep zone (3 - 5 ft), $d_{deep} = V_{deep} / A_{deep}$	$d_{deep} =$ ft
4-21. Enter width of deep zone, $W_{deep} = W_2$	$W_{deep} =$ ft
4-22. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deep}$	$L_{deep} =$ ft
Step 5: Ensure Design Requirements and Site Constraints are Achieved	
5-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the wetland is inadequate to meet the design requirements, choose a new location for the wetland or select an alternative treatment BMP.	

Step 6: Size Outlet Structure

6-1. The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flow from the capital storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

7-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point.

Design Example

Wetland siting requires the following considerations prior to construction: (1) availability of base flow – stormwater wetlands require a regular source of water to support wetland biota, (2) slope stability – stormwater wetlands are not permitted near steep slope hazard areas, (3) surface space availability – large footprint area is required, and (4) compatibility with flood control – basins must not interfere with flood control functions of existing conveyance and detention structures.

The wetland in this example does not have extended detention. An internal berm separates the forebay (Cell 1) and the main basin (Cell 2). The berm is at the elevation of the active volume (SQDV plus sediment storage volume) design surface which is also the permanent wetpool elevation.

Step 1: Determine Water Quality Design Volume

For this design example, a 20-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume	
1-1. Enter drainage area, A	A = 20 acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, % <i>allowable</i>	% <i>allowable</i> = 5
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project}) * (\%allowable)$	$EIA_{allowable} = 1.0$ acres
1-4. Enter Project impervious fraction, <i>Imp</i> (e.g. 60% = 0.60)	<i>Imp</i> = 0.6
1-5. Determine the Project Total Impervious area, $TIA = A_{project} * Imp$	TIA = 12 acres
1-6. Determine the total area from which runoff must be retained, $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 11$ acres
1-7. Determine pervious runoff coefficient using Table E-1 , <i>C_p</i>	<i>C_p</i> = 0.05
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	C = 0.59
1-9. Enter design rainfall depth of the storm, <i>P_i</i> (in)	<i>P_i</i> = 0.75 in

1-10. Calculate rainfall depth, $P = P_i/12$	P = 0.06 ft
1-11. Calculate water quality design volume, $SQDV = 43560 \cdot P \cdot A_{retain} \cdot C$	SQDV = 17,000 ft ³

Step 2: Determine Pond Location and Preliminary Geometry Based on Site Constraints

A total footprint area and total length available for the wetland is provided. This step calculates the total active volume surface area which is equivalent to the permanent wetpool surface area. This step also calculates the dimensions of the internal berm.

Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints	
2-1. Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2. The wetland does not have extended detention.	
2-2. Enter the total surface area of the wetland footprint based on site constraints, A_{tot}	$A_{tot} = 7,500$ ft ²
2-3. Enter the length of the wetland footprint based on site constraints, L_{tot}	$L_{tot} = 200$ ft
2-4. Calculate the width of the wetland footprint, $W_{tot} = A_{tot} / L_{tot}$	$W_{tot} = 38$ ft
2-5. Enter interior side slope as length per unit height (min = 3), Z	$Z = 3$
2-6. Enter desired freeboard depth, d_{fb}	$d_{fb} = 2$ ft
2-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{wq-tot} = L_{tot} - 2Zd_{fb}$	$L_{wq-tot} = 188$ ft
2-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq-tot} = W_{tot} - 2Zd_{fb}$	$W_{wq-tot} = 26$ ft

Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints	
2-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq-tot} = L_{wq-tot} \cdot W_{wq-tot}$	$A_{wq-tot} = 4,900 \text{ ft}^2$
2-10. Enter the width of the internal berm (6 ft min), W_{berm}	$W_{berm} = 6 \text{ ft}$
2-11. Enter the length of the internal berm, $L_{berm} = W_{wq-tot}$	$L_{berm} = 26 \text{ ft}$
2-12. Calculate the area of the berm, $A_{berm} = W_{berm} \cdot L_{berm}$	$A_{berm} = 160 \text{ ft}^2$
2-13. Calculate the active volume surface area excluding the internal berm and freeboard, $A_{wq} = A_{wq-tot} - A_{berm}$	$A_{wq} = 4,740 \text{ ft}^2$

Step 3: Determine Dimensions of Forebay

It should be assumed that the forebay should be 30-50% of the SQDV.

Step 3: Determine Dimensions of forebay	
3-1. Enter the percent of SQDV in forebay (30-50% required), $\%V_1$	$\%V_1 = 30 \%$
3-2. Calculate the active volume of forebay (including sediment storage), $V_1 = (\text{SQDV} \cdot \%V_1)/100$	$V_1 = 5,100 \text{ ft}^3$
3-3. Enter desired average depth of forebay (2-4 ft including sediment storage of 1 ft), d_1	$d_1 = 4 \text{ ft}$
3-4. Calculate the surface area for the water quality volume of forebay, $A_1 = V_1 / d_1$	$A_1 = 1,275 \text{ ft}^2$
3-5. Enter the width of forebay, $W_1 = W_{av-tot} = L_{berm}$	$W_1 = 38 \text{ ft}$
3-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W_1$	$L_1 = 34 \text{ ft}$

Step 4: Determine Dimensions of Cell 2

Verify that the surface area and length-to-width ratio of Cell 2 meet the design criteria. Calculate volumes, depths and surface areas for the very shallow, shallow and deep zones.

Step 4: Determine Dimensions of Cell 2	
4-1. Calculate the active volume of Cell 2, $V_2 = \text{SQDV} - V_1$	$V_2 = 11,900 \text{ ft}^3$
4-2. Calculate surface area of Cell 2, $A_2 = A_{\text{wq}} - A_1$	$A_2 = 3,460 \text{ ft}^2$
4-3. Enter width of Cell 2, $W_2 = W_1 = W_{\text{wq-tot}} = L_{\text{berm}}$	$W_2 = 26 \text{ ft}$
4-4. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	$L_2 = 130 \text{ ft}$
4-5. Verify that the length-to-width ratio of Cell 2 is at least 3:1 with $\geq 4:1$ preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	$LW_2 = 5$
4-6. Enter percent of surface area of very shallow zone, $\%A_{\text{vs}}$	$\%A_{\text{vs}} = 15 \text{ ft}^2$
4-7. Calculate very shallow zone surface area, $A_{\text{vs}} = (A_2 \cdot \%A_{\text{vs}}) / 100$	$A_{\text{vs}} = 520 \text{ ft}^2$
4-8. Enter average depth of very shallow zone (0.1 - 1 ft), d_{vs}	$d_{\text{vs}} = 1 \text{ ft}$
4-9. Calculate volume of very shallow zone, $V_{\text{vs}} = A_{\text{vs}} \cdot d_{\text{vs}}$	$V_{\text{vs}} = 520 \text{ ft}^3$
4-10. Enter width of very shallow zone, $W_{\text{vs}} = W_2$	$W_{\text{vs}} = 26 \text{ ft}$
4-11. Calculate length of very shallow zone, $L_{\text{vs}} = A_{\text{vs}} / W_{\text{vs}}$	$L_{\text{vs}} = 20 \text{ ft}$
4-12. Enter percent of surface area of shallow zone, $\%A_{\text{s}}$	$\%A_{\text{s}} = 55$
4-13. Calculate surface area of shallow zone, $A_{\text{s}} = (A_2 \cdot \%A_{\text{s}}) / 100$	$A_{\text{s}} = 1,900 \text{ ft}^2$
4-14. Enter average depth of shallow zone (1 - 3 ft), d_{s}	$d_{\text{s}} = 3 \text{ ft}$
4-15. Calculate volume of shallow zone, $V_{\text{s}} = A_{\text{s}} \cdot d_{\text{s}}$	$V_{\text{s}} = 5,700 \text{ ft}^3$
4-16. Enter width of shallow zone, $W_{\text{s}} = W_2$	$W_{\text{s}} = 26 \text{ ft}$
4-17. Calculate length of shallow zone, $L_{\text{s}} = A_{\text{s}} / W_{\text{s}}$	$L_{\text{s}} = 220 \text{ ft}$

Step 4: Determine Dimensions of Cell 2	
4-18. Calculate surface area of deep zone, $A_{\text{deep}} = A_2 - A_{\text{vs}} - A_s$	$A_{\text{deep}} = 1,040 \text{ ft}^2$
4-19. Calculate volume of deep zone, $V_{\text{deep}} = V_2 - V_{\text{vs}} - V_s$	$V_{\text{deep}} = 5,680 \text{ ft}^3$
4-20. Calculate average depth of deep zone (3 - 5 ft), $d_{\text{deep}} = V_{\text{deep}} / A_{\text{deep}}$	$d_{\text{deep}} = 5 \text{ ft}$
4-21. Enter width of deep zone, $W_{\text{deep}} = W_2$	$W_{\text{deep}} = 26 \text{ ft}$
4-22. Calculate length of deep zone, $L_{\text{deep}} = A_{\text{deep}} / W_{\text{deep}}$	$L_{\text{deep}} = 40 \text{ ft}$

Step 5: Ensure Design Requirements and Site Conditions are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the wetland is inadequate to meet the design requirements, choose a new location for the wetland or select an alternative treatment BMP.

Step 6: Size Outlet Structure

6-1. The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flow from the capital storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point.

E.11 TCM-4 Sand Filters

Sizing Methodology

A sand filter is designed with two parts: (1) a temporary storage reservoir to store runoff, and (2) a sand filter bed through which the stored runoff must percolate. Usually the storage reservoir is simply placed directly above the filter, and the floor of the reservoir pond is the top of the sand bed. For this case, the storage volume also determines the hydraulic head over the filter surface, which increases the rate of flow through the sand.

Two methods are available for sizing sand filters: a simple method and a routing modeling method. The simple method uses standard values to define filter hydraulic characteristics for determining the sand surface area. This method is useful for planning purposes, for a first approximation to begin iterations in the detailed method, or when use of the detailed computer model is not desired or not available. The simple method very often results in a larger filter than the routing method.

Background

Sand filter design is based on Darcy's law:

$$Q = KiA \quad \text{(Equation E-101)}$$

Where:

- Q = water quality design flow (cfs)
- K = hydraulic conductivity (fps)
- A = surface area perpendicular to the direction of flow (ft²)
- i = hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = \frac{h+l}{l} \quad \text{(Equation E-102)}$$

Where:

- h = average depth of water above the filter (ft), defined for this design as $d/2$
- d = maximum storage depth above the filter (ft)
- l = thickness of sand media (ft)

Darcy's law underlies both the simple and the routing methods of design. The filtration rate V , or more correctly, $1/V$, is the direct input in the sand filter design. The relationship between the filtration rate V and hydraulic conductivity K is revealed by equating Darcy's law and the equation of continuity, $Q = VA$. Specifically:

$$Q = KiA \quad \text{and} \quad Q = VA$$

$$\text{So,} \quad VA = KiA$$

$$\text{Or:} \quad V = Ki \quad \text{(Equation E-103)}$$

Where,

$$V = \text{filtration rate (ft/s)}$$

Note that $V \neq K$. That is, the filtration rate is not the same as the hydraulic conductivity, but they do have the same units (distance per time). K can be equated to V by dividing V by the hydraulic gradient i , which is defined above.

The hydraulic conductivity K does not change with head nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. A design hydraulic conductivity of 1 inch per hour (2 feet per day) used in this simple sizing method is based on bench-scale tests of conditioned rather than clean sand (KCSWDM, 2005) and represents the average sand bed condition as silt is captured and held in the sand bed.

Unlike the hydraulic conductivity, the filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design.

Simple Sizing Method

The simple sizing method does not route flows through the filter. It determines the size of the filter based on the simple assumption that inflow is immediately discharged through the filter as if there were no storage volume. An adjustment factor (0.7) is applied to compensate for the greater filter size resulting from this method. Even with the adjustment factor, the simple method generally produces a larger filter size than the routing method.

Step 1: Determine the water quality design volume

Sand filters should be sized to capture and treat the stormwater quality design volume (see [Section E.1](#)).

Step 2: Determine maximum storage depth of water

Determine the maximum water storage depth (d) above the sand filter. This depth is defined as the depth at which water begins to overflow the reservoir pond, and it

depends on the site topography and hydraulic constraints. The depth is chosen by the designer, but shall be 6 feet or less.

Step 3: Calculate the sand filter area

Determine the sand filter area using the following equation:

$$A_{sf} = \frac{V_{wq}RL}{Kt(h+L)} \quad \text{(Equation E-104)}$$

Where,

A_{sf}	=	surface area of the sand filter bed (ft ²)
V_{wq}	=	water quality design volume (ft ³)
R	=	routing adjustment factor (use $R = 0.7$)
L	=	sand bed depth (ft)
K	=	design hydraulic conductivity (use 2 ft/day)
t	=	drawdown time (use 1 day)
h	=	average depth of water above the filter (ft), (use $d/2$ with d from Step 1)

Routing Method

A continuous runoff model, such as US EPA's Storm Water Management Model (SWMM) Model, can be used to optimally size a sand filter. A continuous simulation model consists of three components: a representative long term period of rainfall data (≈ 20 years or greater) as the primary model input; a model component representing the tributary area to the sand filter that takes into account the amount of impervious area, soil types of the pervious area, vegetation, evapotranspiration, etc.; and a component that simulates the sand filter. Using this method, the filter should be sized to capture and treat the WQ design volume from the post-development tributary area.

The continuous simulation model routes predicted tributary runoff to the sand filter, where treatment is simulated as a function of the infiltrative (flow) capacity of the sand filter and the available storage volume above the sand filter. In a continuous runoff model such as SWMM, the physical parameters of the sand filter are represented with stage-storage-discharge relationships. Due to the computational power of ordinary desktop computers, long-term continuous simulations generally take only minutes to run. This allows the modeler to run several simulations for a range of sand filter sizes, varying either the surface area of the filter (and resulting flow capacity) or the storage capacity above the sand filter, or both. Sufficient

continuous model simulations should be completed so that results encompass the WQ design volume capture goal.

Model results should be plotted for both varying storage depths above the filter and for varying filter surface area (and resulting flow capacity) while keeping all other parameters constant. The resulting relationship of percent capture as a function of sand filter flow and storage capacity can be used to optimally size a sand filter based on site conditions and restraints.

In addition to continuous simulation modeling, routing spreadsheets and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of sand filters may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} =$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$ %
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp =$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA =$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$ acres
1-7. Determine pervious runoff coefficient using <u>Table E-1</u> , C_p	$C_p =$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C =$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i =$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P =$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 \cdot C \cdot P \cdot A_{retain}$	$SQDV =$ ac-ft
Step 2: Determine maximum storage depth of water	
2-1. Determine the maximum storage depth (max 6 ft) of water above the sand filter, d (ft)	$d =$ ft

Step 3: Calculate sand filter area	
3-1. Enter water quality design volume, $SQDV$	$SQDV =$ ft ³
3-2. Enter routing adjustment factor (use $R = 0.7$), R	$R =$
3-3. Enter thickness of sand filter (min. 2 ft, 3 ft preferred), L	$L =$ ft
3-4. Enter design hydraulic conductivity of media (use 2 ft/day), K_{des}	$K =$ ft/day
3-5. Enter drawdown time, t	$t =$ day
3-6. Calculate average depth of water above the filter, $h = d/2$	$h =$ ft
3-7. Calculate sand filter area, $A_{sf} = (SQDV * RL) / (Kt (h + L))$	$A_{sf} =$ ft ²
Step 4: Determine filter dimensions	
4-1. Sand filter area, A_{sf}	$A_{sf} =$ ft ²
4-2. Enter geometric configuration, LR:W ratio (2:1 or greater), L_R	$L_R =$
4-3. Select the width of the sand filter, W	$W =$ ft
4-4. Calculate the length of the sand filter, $L = WL_R$	$L =$ ft
4-5. Calculate rate of filtration, $r_{wq} = K_i$; where $i = \frac{h + l}{l}$	$r_{wq} =$ ft/d
Step 5: Calculate filter longitudinal underdrain collection pipe	
5-1. Calculated filtered flow rate, $Q_f = r_{wq} A_{sf} / 86400$	$Q_f =$ cfs
5-2. Enter minimum slope for energy gradient, S_e	$S_e =$

5-3. Enter Hazen-Williams coefficient for plastic, C	$C =$
5-4. Enter pipe diameter (6" min.), D	$D =$ in
5-5. Calculate pipe hydraulic radius, $R_h = D/48$	$R_h =$ ft
5-6. Calculate velocity at the outlet of the pipe, $V_p = 1.318CR_h^{0.63}S_e^{0.54}$	$V_p =$ ft/s
5-7. Calculate pipe capacity, $Q_{cap} = 0.25\pi(D/12)^2V_p$	$Q_{cap} =$ cfs
Step 7: Provide conveyance capacity for filter clogging	
7-1. The sand filters should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged.	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre site with soil type 4 and 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project} = 10$ acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} = 5$
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} = 0.5$ acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	$Imp = 0.6$
1-5. Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	$TIA = 6$ acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} = 5.5$ acres
1-7. Determine pervious runoff coefficient using Table E-1 , C_p	$C_p = 0.05$
1-8. Calculate runoff coefficient, $C = 0.95 * imp + C_p (1 - imp)$	$C = 0.59$
1-9. Enter design rainfall depth of the storm (in), P_i	$P_i = 0.75$ in
1-10. Calculate rainfall depth (ft), $P = P_i / 12$	$P = 0.06$ ft
1-11. Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	$SQDV = 0.20$ ac-ft

Step 1a: Determine maximum storage depth of water

Determine the maximum storage depth of water above the sand filter.

Step 1a: Determine maximum storage depth of water	
1a-1. Determine the maximum storage depth (max 6 ft) of water above the sand filter, d (ft)	$d = 6 \text{ ft}$

Step 2: Calculate Sand Filter Area

A sand filter is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a sand filter bed through which the stored runoff must percolate getting treatment.

The simple sizing method does not route flows through the filter. The size of the filter is determined based on the simple assumption that inflow is immediately discharged through the filter. The adjustment factor, R , is applied to compensate for the greater filter size resulting from this method.

Step 2: Calculate sand filter area	
2-1. Enter water quality design volume, $SQDV$	$SQDV = 0.20 \text{ ac-ft}$
2-2. Enter routing adjustment factor (use $R = 0.7$), R	$R = 0.7$
2-3. Enter thickness of sand filter (min. 2 ft, 3 ft preferred), L	$L = 2 \text{ ft}$
2-4. Enter design hydraulic conductivity (use 2 ft/day), K	$K = 2 \text{ ft/day}$
2-5. Enter drawdown time (use 1 day), t	$t = 2 \text{ day}$
2-6. Calculate average depth of water above the filter, $h = d/2$	$h = 3 \text{ ft}$
2-7. Calculate sand filter area, $A_{sf} = (SQDV * RL) / (Kt (h + L))$	$A_{sf} = 0.014 \text{ acre}$

Step 3: Determine Filter Dimensions

Step 3: Determine filter dimensions	
3-1. Sand filter area in ft^2 , $A_{sf(\text{feet})} = A_{sf(\text{acre})} * 43,560$	$A_{sf} = 610 \text{ ft}^2$
3-2. Enter geometric configuration, LR:W ratio (2:1 min.), L_R	$L_R = 2$
3-3. Calculate the width of the sand filter, W	$W = 18 \text{ ft}$

Step 3: Determine filter dimensions	
3-4. Calculate the length of the sand filter, L	$L = 36$ ft
3-5. Calculate rate of filtration, $r_{wq} = Ki$, where $i = \frac{h+l}{l}$	$r_{wq} = 2.3$ ft/d

Step 4: Calculate Filter Longitudinal Underdrain Collection Pipe

All underdrain pipes must be 6 inches or greater to facilitate cleaning.

Step 5: Calculate filter longitudinal underdrain collection pipe	
5-1. Calculated filtered flow rate, $Q_f = r_{wq}A_{sf}/86400$	$Q_f = 0.01$ cfs
5-2. Enter minimum slope for energy gradient, Se	$Se = 0.005$
5-3. Enter Hazen-Williams coefficient for plastic, C	$C = 140$
5-4. Enter pipe diameter (6" min), D	$D = 6$ in
5-5. Calculate pipe hydraulic radius, $R_h = D/48$	$R_h = 0.13$
5-6. Calculate velocity at the outlet of the pipe, $V_p = 1.318CR_h^{0.63}S_e^{0.54}$	$V_p = 2.9$ ft/s
5-7. Calculate pipe capacity, $Q_{cap} = 0.25\pi(D/12)^2V_p$	$Q_{cap} = 0.57$ cfs

Step 5: Provide Conveyance Capacity for Filter Clogging

The sand filters should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged.

APPENDIX F : FLOW SPLITTER DESIGN SPECIFICATIONS

F.1 Flow Splitter Introduction

Flow splitters must be provided for off-line facilities to divert the water quality design flow to the BMP and bypass higher flows. In most cases, it is a designer's choice whether storm water treatment BMPs described in this manual are designed as on-line or off-line; exceptions are vegetated strip filters, permeable pavement, and building BMPs which are designed on-line.

A crucial factor in designing flow splitters is to ensure that low flows are delivered to the treatment facility up to the water quality design flow rate. Above this rate, additional flows remain in the storm drain or are diverted to a bypass drain with minimal increase in head at the flow splitter structure to avoid surcharging the water quality facility under high flow conditions.

Flow splitters are typically manholes or vaults with baffles. In place of baffles, the splitter mechanism may be a half tee section with a solid top and an orifice in the bottom of the tee section. A full tee option may also be used (see "Design Criteria" below). Two possible design options for flow splitters are shown in the figures in this Appendix. Other equivalent designs that achieve the result of splitting low flows, up to the WQ design flow, into the WQ treatment facility and divert higher flows around the facility are also acceptable.

Flow splitters may be modeled using standard level pool routing techniques, as described in the Handbook of Applied Hydrology (Ven te Chow; 1964) and elsewhere. The stage/discharge relationship of the outflow pipes shall be determined using backwater analysis techniques. Weirs shall be analyzed as sharp-crested weirs.

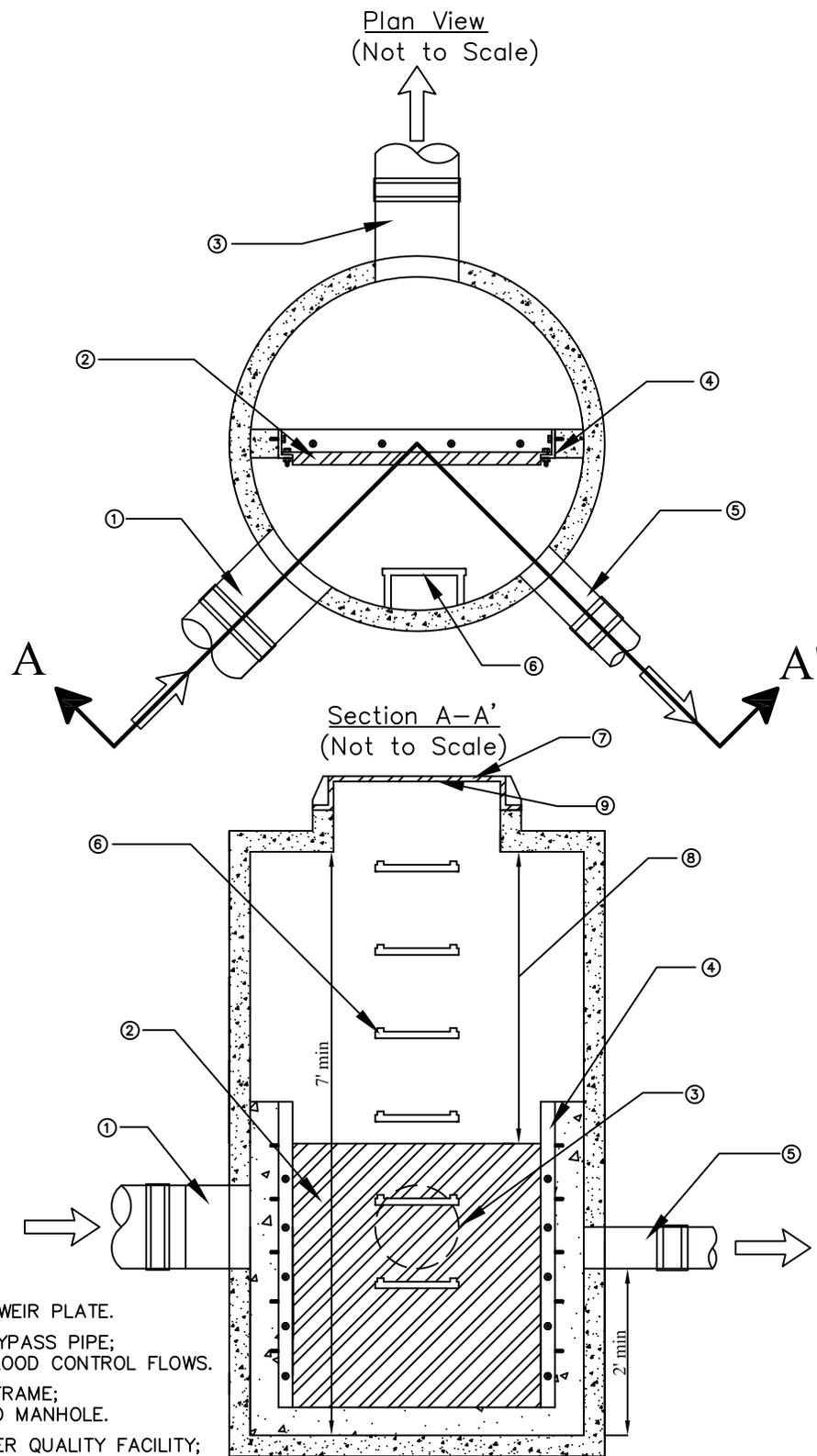
Design Criteria

- 1) A flow splitter shall be designed to deliver the required water quality design flow rate to the storm water treatment facility.
- 17) The top of the weir shall be located at the water surface for the design flow. Remaining flows enter the bypass line.
- 18) The maximum head shall be minimized for flow in excess of the water quality design flow. Specifically, flow to the treatment facility at the flood control design storm water surface shall not increase the design water quality design flow by more than 10%.
- 19) Example designs are shown in the figures in this Appendix. Equivalent designs are also acceptable.
- 20) Special applications, such as roads, may require the use of a modified flow splitter. The baffle wall may be fitted with a notch and adjustable weir plate to proportion runoff volumes other than high flows.

- 21) For ponding facilities, backwater effects must be included in designing the height of the standpipe in the manhole.
- 22) Ladder or step and handhold access shall be provided. If the weir wall is higher than 36 inches, two ladders, on the either side of the wall, are required.

F.2 Material Requirements

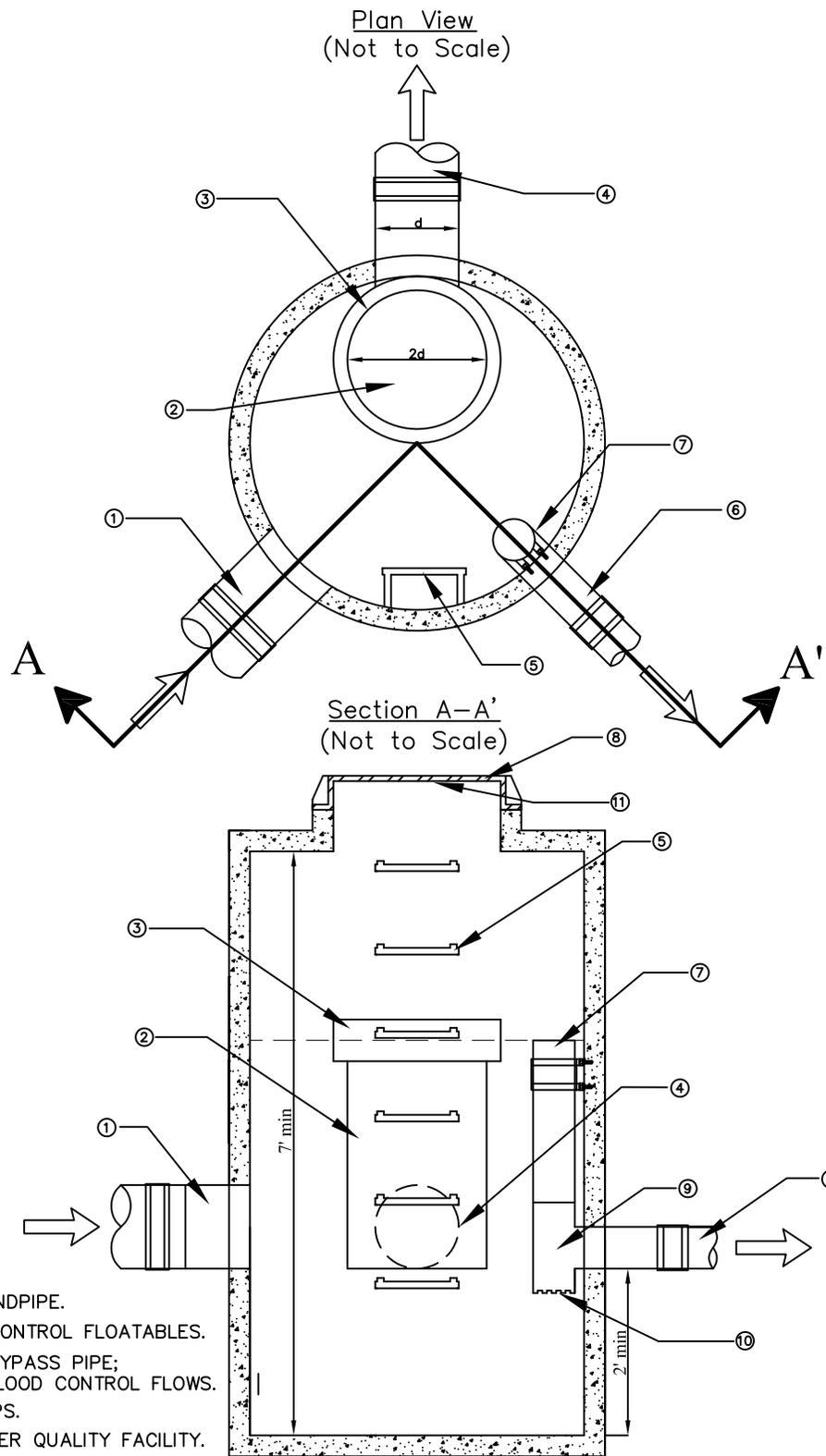
- 1) The splitter baffle shall be installed in a standard manhole or vault. The baffle wall shall be made of material resistant to corrosion (minimum 4-inch thick reinforced concrete, Type 302 or Type 316 stainless steel plate, or equivalent).
- 23) The minimum clearance between the top of the baffle wall and the bottom of the manhole or vault cover shall be 4 feet; otherwise, dual access points shall be provided.
- 24) All metal parts shall be corrosion resistant. Examples of preferred materials include aluminum, stainless steel, and plastic. Zinc and galvanized materials are not permitted because of aquatic toxicity. Painting metal parts shall not be allowed because of poor longevity.



NOTES:

- ① INLET PIPE.
- ② ADJUSTABLE WEIR PLATE.
- ③ HIGH FLOW BYPASS PIPE; SIZED FOR FLOOD CONTROL FLOWS.
- ④ WEIR PLATE FRAME; ANCHORED TO MANHOLE.
- ⑤ PIPE TO WATER QUALITY FACILITY; SIZED FOR WATER QUALITY FLOWS.
- ⑥ ACCESS STEPS.
- ⑦ 24" ROUND FRAME AND SOLID LID.
- ⑧ 4' MIN DISTANCE OR PROVIDE SEPARATE ACCESS ON BOTH SIDES OF WEIR.
- ⑨ AFFIX PERMANENT IDENTIFICATION TAG.

<p>Figure F-1: Flow Splitter Option A</p>



NOTES:

- ① INLET PIPE.
- ② BYPASS STANDPIPE.
- ③ BAFFLE TO CONTROL FLOATABLES.
- ④ HIGH FLOW BYPASS PIPE; SIZED FOR FLOOD CONTROL FLOWS.
- ⑤ ACCESS STEPS.
- ⑥ PIPE TO WATER QUALITY FACILITY.
- ⑦ RISER PIPE; TOP OF PIPE AT DESIGN ELEVATION FOR WATER QUALITY FLOWS.
- ⑧ 24" ROUND FRAME AND SOLID LID.
- ⑨ REMOVABLE "TEE" SECTION FOR CLEANOUT.
- ⑩ RISER PIPE ORIFICE SIZED FOR WATER QUALITY FLOWS.
- ⑪ AFFIX PERMANENT IDENTIFICATION TAG.

<p>Figure F-2: Flow Splitter Option B</p>

APPENDIX G: DESIGN CRITERIA CHECKLISTS FOR STORMWATER RUNOFF BMPS

BIO-1 Bioretention Checklist

- Has the bioretention facility been sized to treat the water quality design volume, SQDV (see worksheet)?
- Does the bioretention have a maximum ponding depth of 18 in.?
- Is the planting soil depth at least 2 feet?
- Has an underdrain been provided if native soil permeability is less than 0.5 in/hr and infiltration is not possible/allowed?
- Has a gravel drainage layer been provided if native soil permeability is greater than 0.5 in/hr and infiltration is possible/allowed?
- Does the bioretention ponding depth drain below the planting soil in less than 48 hours?
- Is the gravel drainage layer sized to adequately meet the maximum drawdown time of 96 hours?
- Has the bioretention facility been properly sized as recommended in the manual?
- Does the flow entrance meet specifications (dispersed, low velocity flow; dispersed flow across pavement; flow spreading trench; cuts or wheel slots for parking lots)?
- Does the pipe flow entrance include erosion protection material to dissipate flow energy?
- Is the flow path unblocked by trees and shrubs?
- Is the underdrain at least 6 inches in diameter?
- Is the underdrain pipe made of accepted material (slotted PVC pipe conforming to ASTM C 3034 or equivalent HDPE pipe conforming to AASHTO 252M)?
- Does the slotted pipe have correct sizing and spacing of slots?
- Is the underdrain sloped at 0.5% or more?
- Are rigid observation pipes connected to underdrain every 250 to 300 feet of installed pipe?
- Do the observation pipe wells/clean outs extend 6 inches above top elevation of bioretention facility mulch and are they capped as required?

- Does the gravel underdrain bedding consist of the correct aggregate?
- If geotextile fabric is placed between the planting media and gravel layer, does it meet the specifications outlined in the manual?
- Does the gravel underdrain bedding extend at least 6 inches below the underdrain pipe (if needed) and does it provide 1 foot depth around top and sides of pipe?
- Does the underdrain drain freely to the accepted discharge point?
- Is an overflow device consisting of vertical PVC pipe included in design?
- Has the overflow device been installed at the 18-inch ponding depth?
- Is the overflow riser at least 6 inches in diameter?
- Has the inlet to the riser been positioned at least 6 inches above the planting media and capped with a spider cap?
- If bioretention is close to roads or infrastructure, have infiltration pathways been restricted with geomembrane (at least 30 mm) or clay liners?
- Is planting soil composed of correct aggregate (60-70% sand; 30-40% compost) and free of stones, stumps and roots?
- Does compost have acceptable characteristics?
- Is constructed bioretention facility covered with well-aged mulch, free of seeds, weeds, soil and roots, and at least 2-3 inches thick?
- Is all bioretention vegetation tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 72 hours?
- Have an adequate number of different plant species been incorporated into the bioretention (It is recommended that 3 tree, 3 shrub, and 3 herbaceous groundcover species be included)?
- Have native plants been used to the maximum extent practicable?

BIO- 2 Planter Box Checklist

- Is the planter box tributary area less than 15,000 ft²?
- Is the groundwater level at least 2 feet below the bottom of the planter box?
- Is there adequate relief between land surface and stormwater conveyance system to permit vertical percolation?
- Is the planter box located in an area with adequate sunlight to support selected vegetation?
- Is the planter box sized to treat the water quality design volume, V_{wq} (see worksheet)?
- Does the planter box have a maximum ponding depth of 12 inches?
- Is the planting soil depth at least 2 feet (3 feet preferred)?
- Does the ponded water drain below the planting soil in less than 48 hours?
- Has the distance between the downspouts and the overflow outlet been maximized?
- Has the planter box been sized the same as a Bioretention facility with planter box parameters?
- Has the planter box been constructed with an appropriate non-leaching permanent material?
- Has the planter box structure been adequately sealed to ensure that water exits only via the underdrain?
- Has an underdrain been provided?
- If the entrance to the planter box is piped, has erosion protection been included in the design (erosion protection includes rock, splash blocks, etc.)?
- Is the entrance flow path unimpeded by woody plants (trees, shrubs)?
- Is the underdrain at least 6 inches in diameter?
- Is the underdrain pipe made of accepted material (slotted PVC pipe conforming to ASTM C 3034 or equivalent HDPE pipe conforming to AASHTO 252M)?
- Does the slotted pipe have correct sizing and spacing of slots?
- Is the underdrain sloped at 0.5% or more?

- Are rigid observation pipes connected to underdrain every 250 to 300 feet of installed pipe?
- Do the observation pipe wells/clean outs extend 6 inches above top elevation of the planter box mulch and are they capped as required?
- Does the gravel underdrain bedding consist of the correct aggregate?
- Does the gravel underdrain bedding extend at least 6 inches below the underdrain and does it provide 1 foot depth around top and sides of pipe?
- If geotextile fabric is used in the underdrain design, does it meet minimum materials requirements?
- Is the underdrain elevated from the bottom of the planter box by 6 inches?
- Does the underdrain drain freely to the intended discharge point?
- Is an overflow device consisting of vertical PVC pipe included in design?
- Is the overflow riser at least 6 inches in diameter?
- Is the inlet to the riser 6 inches above planting soil and capped with a spider cap?
- Has a waterproof barrier consisting of a 30 mil geomembrane or equivalent been provided to protect foundations from moisture?
- Is planting soil composed of correct aggregate (60-70% sand; 30-40% compost) and gradation, and free of stones, stumps and roots?
- Does compost have acceptable characteristics (see planting/storage media)?
- Is planter box covered with well-aged mulch, free of seeds, weeds, grass clippings, bark, soil and roots, and at least 2-3 inches thick?
- Do all soil minerals meet requirements?
- Is all planter box vegetation tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 72 hours?
- Have an adequate number of different plant species been incorporated into the planter box design (It is recommended that 3 tree, 3 shrub, and 3 herbaceous groundcover species be included)?
- Have native plants been used to the maximum extent practicable?
- Have only slow-release fertilizers been included in the design?
- Have arrangements been made to replace planter box mulch layer annually?

- Have low-maintenance plants been selected for design?
- Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the planter box design?

BIO-3 Proprietary Biotreatment Device Checklist

- Has the proprietary biotreatment device been selected from the list provided in the manual or from another Ventura County- approved list?
- Has the vendor been contacted for the latest design guidance on cartridge selection?
- Has the proprietary biotreatment device been installed as directed by the vendor?
- Have appropriate maintenance and operation arrangements been made to ensure upkeep of the device?
- Has the biotreatment device been sized to capture and treat the water quality design flow?

BIO-4 Vegetated Swale Checklist

- Does the climate provide adequate conditions for maintaining a vegetative cover? Has adequate vegetation been chosen given the climate?
- Is the grade in the area shallow so as to not allow ponding?
- Is the swale compatible with existing flood control functions?
- Has the swale been designed with a depth of one foot or less?
- Is the overall depth from the top of the side walls to the bottom of the swale at least 12 inches?
- Is the swale bottom width at least 2 feet?
- Is the swale bottom width no greater than 10 feet, or 16 feet with a dividing berm?
- If the swale is required to convey flood flows in addition to the water quality design flow, has the swale been designed for the flood control design storm and does it include 2 feet of freeboard?
- Have gradual meandering bends been incorporated into the design?
- Is the longitudinal slope (in direction of flow) between 1% and 6%?
- Has an underdrain been provided if soils are poorly drained and longitudinal slope is less than 1.5%? Has a soils report been provided if this is the case?
- If the longitudinal slope is greater than 6%, have appropriate check dams with vertical drops of 12 inches or less been provided in the design to reduce the slope?
- Is the horizontal slope at the bottom of the swale flat to discourage channeling?
- Has the swale been designed so that the water depth does not exceed 4 inches or $\frac{2}{3}$ the height of vegetation (2 inches in frequently mowed turf swales)?
- Does the swale length provide a minimum hydraulic residence time of 7 minutes?
- If soil and slope conditions require it, has an acceptable low flow drain been installed?
- Has the swale been designed to convey the SQDF?

- Has the swale been sized as recommended in Chapter 6 (also see worksheet, Appendix E)?
- Has the swale been designed as a flow-through channel or has a high-flow bypass been incorporated into the design for flows higher than the water quality design flow?
- Has inflow been directed towards the upstream end of the swale or, at a minimum, evenly over the length of the swale?
- If the swale is online, has it been designed to convey flows up to the post-development 100 year 24 hour storm, with freeboard, and velocities below 3 ft/s?
- If the swale is off-line, has it been designed to convey the water quality design flow rate using a flow splitter with velocities below 1 ft/s?
- If check dams are incorporated in the design, have flow spreaders been added at the toe of each vertical drop?
- If curb cuts are used, has pavement been placed 1 – 2 inches above the elevation of the vegetated area?
- Is the swale inflow designed to function long term with minimal maintenance?
- Has flow spreading at the inlet of the swale been achieved by a leveled anchored flow spreader or similar method?
- Does the flow spreader project a minimum of 2 inches above the ground surface with appropriately spaced notches and extend horizontally beyond facility to prevent erosion
- If an underdrain is required, does it meet appropriate criteria (PVC or equivalent, correct slot spacing and sizing, 6 inches minimum in diameter, sloped at 0.5%)?
- Is there gravel bedding at least 6 inches below and 1 foot to the top and sides of the underdrain?
- If a geotextile is included in the design, does it meet requirements?
- Does gravel drainage layer meet recommended criteria?
- Does swale divider, if included, meet criteria (minimum height of 1 inch above flow, slopes no steeper than 2H:1V, stable foundation)?

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- Has swale soil been amended with compost if organic content is less than 10%?
- Have appropriate, hardy and native plants been used to the maximum extent practical?
- Is vegetative cover at least 4 inches in height (ideally 6 inches)?
- Has the swale been located away from trees that may drop leaves or provide insufficient sunlight?

BIO-5 Vegetated Filter Strip Checklist

- Is the slope of the filter strip designed to avoid both erosive flows and ponding?
- Has the strip been designed to evenly distribute flow across width and promote sheet flow?
- Does the width of the filter strip extend across the full width of the tributary area?
- Is the upstream boundary of the filter located contiguous to developed area?
- If filter strip is used for water quality purposes, is the length between 15 and 150 feet (25 feet preferred)? If the strip is used for pretreatment, is it at least 4 feet in length?
- Is the slope of the strip parallel to the direction of flow between 2% and 6%?
- Is the lateral slope (perpendicular to flow) of the strip 4% or less?
- Is grading across strip even?
- Has the top of the strip been installed 2 to 5 inches below any adjacent pavement (a beveled transition is also acceptable)?
- Are the top and toe of the slope as flat as possible (graded flat for engineered filter strips) to encourage sheet flow and prevent erosion?
- Has the design flow been calculated using the SQDF (see worksheet)?
- Has the design flow depth been calculated using a modified Manning's equation (see worksheet)?
- Have the design velocity and length been calculated using the design flow and design flow depth as recommended (see worksheet)?
- Has a flow spreader been implemented to uniformly distribute contributing flow along width of filter strip?
- If a gravel flow spreader is used, is it at least 6 inches deep, 12 inches wide and a minimum of 1 inch below the paved surface?
- Has the gravel flow spreader been leveled even where ground is not level?
- If the gravel flow spreader is placed along a roadway, have LA county design specifications been consulted and implemented?

APPENDIX G: DESIGN CRITERIA CHECKLISTS

- If a notched curb spreader and through-curb spreader are used, have they been used in conjunction with a gravel spreader?
- Have curb port/interrupted curb openings been spaced at intervals of at least every 6 feet?
- Do the curb port/interrupted curb openings have a width of at least 11 inches?
- Does 15% or more of the curb length consist of open ports and does each port discharge no more than 10% of the flow?
- Have energy dissipaters (such as a riprap pad) been used if a sudden slope drop occurs?
- Has access been provided at the upper edge of filter strip for mowing equipment and to enable maintenance of spreader?
- Is the design water depth 1 inch or less?
- Does the design velocity not exceed 1 foot per second?
- If the organic content of the filter strip soil does not exceed 10%, has the soil been amended with at least 2 inches of well-rotted acceptable compost at a depth of 6 inches?
- Is filter strip uniformly graded and densely vegetated with erosion-resistant grasses (preferably native or adapted species)?
- Has irrigation been provided to establish grasses?
- Have maintenance arrangements been made to maintain grass at a height of 2 to 4 inches?
- Have trees and shrubs been limited along the filter strip?
- Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the design?

BIO-6 Green Roof Checklist

- Is the roof shallow enough to support a green roof (<25% slope)?
- Are the roof supports sufficient to support additional weight of soil, water, vegetation, and a drainage layer (if needed) [a licensed structural engineer should be consulted]?
- Has an appropriate waterproof membrane been placed below the green roof?
- Has an appropriate drainage layer been incorporated in the design (if required)?
- Has an appropriate soil mix been used in the design to allow for drainage, support vegetative growth, and that is not excessively heavy when wet?
- Has vegetation been carefully selected to improve aesthetics, resist erosion, withstand extreme environments, and tolerate drought without the need for fertilizers and pesticides and without a lot of maintenance requirements (see Appendix H for a recommended plant list)?
- Have native plants been chosen to the maximum extent practical?
- If trees or shrubs are incorporated, has an adequate soil depth been provided and is the additional soil depth supported by the roof structure?
- Has irrigation been provided to establish vegetation?
- Does vegetation cover 90% of the total area?
- Is the green roof located in an area without excessive shade to avoid poor vegetative growth?
- Is there an appropriate drain pipe or gutter to convey any runoff from roof to a stormwater BMP or stormwater conveyance system?

FILT-1 Sand Filter Checklist

- Has sand filter been located away from trees and areas that could contribute eroded sediment?
- If there is a chance for sediment to be present in flow to be treated, has pretreatment been provided?
- Does site have adequate relief to permit vertical percolation through sand filter and into conveyance system?
- Has pretreatment (vegetated swale or filter strip, hydrodynamic separator) been adequately provided to reduce the sediment load entering the filter?
- Has the sand filter been sized to capture the SQDV?
- Has the sand filter been designed with a 1.5:1 length to width ratio or greater?
- Is the filter bed depth at least 2 feet (3 feet preferred)?
- Is the depth of water storage over the filter bed 6 feet or less?
- Is the overflow structure designed to pass the water quality design storm?
- Has the sizing of the filter been determined using the adapted Darcy's Law equation recommended in the sizing methodology section in Chapter 6 (also see worksheet, Appendix E)?
- Does the sand meet the recommended specifications (0.2-0.35 mm diameter, $C_u < 3$, ASTM C 33 size gradation, etc.)?
- Has an underdrain been employed in the design? [Examples: central underdrain w/lateral pipes, longitudinal pipes, single pipe for small filters]
- Is the underdrain placed in an 8 inch minimum gravel backfill or drain rock bed?
- Are all underdrain pipes and connectors 6 inches or greater with clean-out risers of equal diameter?
- Have clean-out risers been placed at the terminal ends of all pipes and extend to the surface of the filter?
- Has a valve box been provided for access to the clean-outs and is it water tight?
- Are underdrain pipes laid with perforations downward, and are perforations at least 1/2 inch in diameter?

- Are all lateral collection pipes within 9 feet or less of each other (perpendicular distance)?
- Have all pipes been placed with a minimum slope of 0.5%?
- Is the invert of the underdrain outlet above the seasonal high groundwater level?
- Is gravel backfill present around the underdrain pipe at least 6 inches below and to the sides of the pipe and 8 inches above the pipe?
- Does the bottom gravel have a diameter of at least 2 times the size of the perforated openings to the drainage system and meet other specifications (specific gravity of 2.5 or more, rounded, free of debris)?
- Has an appropriate geotextile layer (see underdrain section) or 2-inch transition layer been placed between the sand layer and the drain rock/gravel backfill layer?
- Has a flow spreader been installed at the inlet along one side of the filter (long side of the filter if L: W is 2:1 or greater; 20% of perimeter for curved or irregular shape)?
- Has erosion protection been provided along the first foot of the sand bed adjacent to the flow spreader (i.e. geotextile weighted with sand bags; quarry spalls)?
- Has no topsoil, clay, or sod (except sod grown in sand) has been added to the sand filter bed?
- Has vegetation been selected properly (i.e. must withstand drought, heavy saturation, etc.)?
- Are no permanent structures built on top of the sand filter bed?
- No large shrubs or trees should be planted in sand filter bed or within 15 feet of inlet or outlet pipes
- Have native plants been used to the maximum extent practicable?
- Has an emergency overflow structure been provided?
- Are interior side slopes above water quality design depth no steeper than 3:1 H:V?
- Are exterior side slopes no steeper than 2:1 H:V?
- If pond walls are vertical retaining walls, do they meet recommended specifications (see side slopes section)?

APPENDIX G: DESIGN CRITERIA CHECKLISTS

- Do embankments meet appropriate criteria [top width or 20 feet, constructed on native consolidated soil, in accordance with standard specifications, proper excavation, constructed of appropriate compacted soil]?
- Are maintenance access roads/ramps to filter provided?
- Have trees and shrubs been planted further than 10 feet away from inlet and outlet pipes (50 feet for 'water-seeking' plants such as willows and poplars)?
- Have prohibited non-native plants been removed from the site?
- Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the planter box design?

FILT-2 Cartridge Media Filter

- Has the vendor been contacted for the latest design guidance on cartridge selection?
- Has the cartridge media filter been provided with a system to completely drain the system and prevent vector annoyances?
- Has the cartridge media filter been sized to capture and treat the SQDF?
- Have site considerations been taken into account when sizing the cartridge media filter and selecting features (often vendor websites offer assistance with this)?

INF-1 Infiltration Trench Checklist

- Has the infiltration trench been located away from steep slopes (>25%)?
- Is the infiltration trench set back from structures and leach fields?
- Is there at least 10 feet or vertical separation between the bottom of the infiltration trench and the shallow groundwater table?
- Is the depth to bedrock adequate to provide proper infiltration?
- Has the site been checked to ensure that no preexisting contamination is present?
- Does the site have low sediment loading rates to prevent infiltration trench clogging?
- Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- Has a geotechnical investigation and report been provided if needed?
- Has the infiltration trench been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- Has the infiltration trench been set back from existing septic system drain fields and drinking water wells?
- Has pretreatment been provided with a vegetated swale, filter strip, sand filter or proprietary device?
- Is the trench at least 2 feet wide and 3 to 5 feet deep?
- Is the longitudinal slope of the trench 3% or less?
- Is the top layer of the media filter gravel/choking stone/geotextile fabric if flow is sheet flow and 12 inches of surface soil if flow enters through an underground pipe?
- Is middle layer of media filter 3-5 feet of washed 1.5 to 3 in. gravel with void space of 30 to 40%?
- Is bottom layer of media filter 6" of clean, washed sand?
- Have one or more observation wells been installed?

- Do observation wells consist of recommended slotted 4-6 inch diameter PVC well screen capped with lockable, above-ground lid?
- Has the infiltration trench been sized to capture and infiltrate the SUSMP defined water quality design volume?
- Has the infiltration trench been designed to infiltrate all runoff within 72 hours?
- Has the maximum depth of runoff, ponding depth/trench depth and infiltrating surface area been calculated using recommended design equations (see sizing methodology section/worksheet)?
- Is the bottom of the infiltration bed native soil, over-excavated to at least one foot in depth and replaced uniformly (with 2-4 inches of coarse sand amendments) without compaction?
- Has all vertical piping been classified correctly (see drainage section in manual)?
- Has an observation well been incorporated into the design to ensure that the 72 hour maximum drawdown time is met?
- Has an overflow route been provided to safely convey flows that overtop the facility or in the case that the facility becomes clogged?
- Has the overflow channel been designed to safely convey flows from peak design storm to a downstream conveyance system or acceptable discharge point?
- Has the infiltration trench been kept free of vegetation, and is all existing vegetation surrounding the trench been planted away from trench to avoid drip lines overhanging the facility?
- Is there safe maintenance access provided to the site for both wet and dry conditions?
- Has an access road along the length of the trench been provided if there is no existing road or parking lot that can be used for maintenance access?
- Has access to “operate a backhoe at ‘arms length’” been provided?
- Was the entire area draining to the facility stabilized before construction began?
- Have you ensured that the infiltration trench is not hydraulically connected to the storm water conveyance system?

- If heavy construction material was used to compact subgrade (not recommended), has the infiltrative capacity of the soil been restored via tilling or aerating prior to placing the infiltration bed?

- Were the exposed subgrade soils inspected by a civil engineer prior to construction to confirm suitable soil conditions for the infiltration facility?

INF-2 Drywell Checklist

- Has the drywell been located away from steep slopes (>25%)?
- Is the drywell set back from structures and leach fields?
- Is there at least 10 feet or vertical separation between the bottom of the drywell and the shallow groundwater table?
- Is the depth to bedrock adequate to provide proper infiltration?
- Has the site been checked to ensure that no preexisting contamination is present?
- Does the site have low sediment loading rates to prevent drywell from clogging?
- Has pretreatment been provided for all non-rooftop runoff flowing to the drywell?
- Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- Has a soil assessment report been completed, which determines the suitability of the site for an drywell, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- Has the drywell been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- Has the drywell been set back from existing septic system drain fields and drinking water wells?
- Has pretreatment been provided to prevent sediment and other large particulates?
- Is the surface area of the drywell large enough to infiltrate the storage volume in 72 hours based on maximum allowable depth?
- Is the top layer of the media filter gravel/choking stone/geotextile fabric if flow is sheet flow and 12 inches of surface soil if flow enters through an underground pipe (pipe should be fitted with a screen)?
- Is middle layer of media filter 3-5 feet of washed 1.5 to 3 in. gravel with void space of 30 to 40%?
- Is bottom layer of media filter 6" of clean, washed sand?

APPENDIX G: DESIGN CRITERIA CHECKLISTS

- Have one or more observation wells been installed?
- Do observation wells consist of recommended slotted 4-6 inch diameter PVC well screen capped with lockable, above-ground lid?
- Has the drywell been sized to capture and infiltrate the SUSMP defined water quality design volume?
- Has the drywell been designed to infiltrate all runoff within 72 hours?
- Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- Has the maximum depth of runoff, ponding depth/trench depth and infiltrating surface area been calculated using recommended design equations (see sizing methodology section/worksheet)?
- Is the bottom of the infiltration bed native soil, over-excavated to at least one foot in depth and replaced uniformly (with 2-4 inches of coarse sand amendments) without compaction?
- Has all vertical piping been classified correctly (see drainage section in manual)?
- Has an observation well been incorporated to ensure that the 72 hour maximum drawdown time is met?
- Has an overflow route been provided to safely convey flows that overtop the facility or in the case that the facility becomes clogged?
- Has the overflow channel been designed to safely convey flows from peak design storm to a downstream conveyance system or acceptable discharge point?
- Has the drywell been kept free of vegetation, and is all existing vegetation surrounding the trench been planted away from trench to avoid drip lines overhanging the facility?
- Is there safe maintenance access provided to the site for both wet and dry conditions?
- Has maintenance access been provided?
- Was the entire area draining to the facility stabilized before construction began?
- Have you ensured that the infiltration trench is not hydraulically connected to the storm water system?

- If heavy construction material was used to compact subgrade (not recommended), has the infiltrative capacity of the soil been restored via tilling or aerating prior to placing the infiltration bed?

- Were the exposed subgrade soils inspected by a civil engineer prior to construction to confirm suitable soil conditions for the infiltration facility?

INF-3 Proprietary Infiltration BMPs Checklist

- Has the infiltration facility been located away from steep slopes (>25%)?
- Is the infiltration facility set back from structures and leach fields?
- Is there at least 10 feet or vertical separation between the bottom of the infiltration facility and the shallow groundwater table?
- Is the depth to bedrock adequate to provide proper infiltration?
- Has the site been checked to ensure that no preexisting contamination is present?
- Does the site have low sediment loading rates to prevent infiltration facility clogging?
- Has pretreatment been provided to prevent premature failure (If infiltration facility fails, complete construction is required)?
- Has infiltration facility been designed to receive runoff only from sections of the site that have been stabilized?
- If infiltration facility fails, complete construction is required
- Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- Has the infiltration trench been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- Has the infiltration BMP been sized to capture and treat the water quality design volume?
- Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- Have the recommended sizing guidelines set by the vendor been referenced and used for selection and use of infiltration facility?

INF-4 Permeable Pavement Checklist

- Has the permeable pavement been located away from steep slopes (>25%)?
- Is the permeable pavement set back from structures and leach fields?
- Is there at least 10 feet or vertical separation between the bottom of the permeable pavement and the shallow groundwater table?
- Is the depth to bedrock adequate to provide proper infiltration?
- Has the site been checked to ensure that no preexisting contamination is present?
- Does the site have low sediment loading rates to prevent infiltration trench clogging?
- Has the permeable pavement been designed to receive runoff only from sections of the site that have been stabilized?
- Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- Has the permeable pavement been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- Has the run off been assessed for necessity of pretreatment?
- If pretreatment is required, has it been provided to treat run on before it reaches permeable pavement?
- Has the infiltration BMP been sized to capture and treat the water quality design volume?
- Have the infiltration capabilities of the site been assessed (i.e. full, partial, or no infiltration allowed)?
- If no infiltration is allowed, has an underdrain been prohibited?

- If permeable pavement is located on a site with a slope greater than 2%, has the area been terraced to prevent lateral flow through subsurface?
- Has the permeable pavement been designed to infiltrate flows through four different layers (incl. top wearing layer, stone reservoir, and transition layers) of material (or through a similar system)?
- Has the depth of each layer (and void space), along with the hydrology, hydraulics, and structural requirements of the site been determined and approved by a licensed civil engineer?
- If proprietary permeable pavement is used (i.e. concrete or other pavers), have the design requirements and installation steps been obtained from the vendor and referenced in the selection and construction of the permeable pavement?
- Has the permeable pavement been designed to drain in less than 72 hours and allowed to dry out periodically?
- Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- Has an overflow mechanism been included in the pavement design?
- If the overflow mechanism employed is perimeter control, have controls such as a perimeter vegetated swale, perimeter Bioretention, storm drain inlets, or other acceptable control been implemented?
- If the overflow mechanism employed are overflow pipes, have the pipes been connected to the underdrain, are they located away from vehicular traffic, and is the top of the pipe fitted with a screen?
- Has the pavement been laid close to level with bottom of base layers level to ensure uniform infiltration?
- Are site materials stored away from permeable pavement?
- Has landscaping and stabilization of adjacent areas been completed before installation of pavement?

GS-1 Hydrodynamic Separation Device Checklist

- Has the vendor been contacted for the latest model and design guidance prior to selection of device?
- Has the device been sized to capture and treat the water quality design flow rate?
- Has the vendor been contacted for sizing and installation guidance?
- Has periodic maintenance been scheduled and budgeted for?

GS-2 Catch Basin Insert Checklist

- Has the vendor been contacted for the latest model and design guidance prior to selection of device?
- Has the insert been sized to capture and treat the water quality design flow rate?
- Has the vendor been contacted for sizing and installation guidance?
- Has periodic maintenance been scheduled and budgeted for?

APPENDIX H: STORMWATER CONTROL MEASURE ACCESS AND MAINTENANCE AGREEMENTS

(Long Form)

Recorded at the request of:

City of _____

After recording, return to:

City of _____

City Clerk

Stormwater Treatment Device Access and Maintenance Agreement

OWNER:

PROPERTY ADDRESS: _____

APN:

THIS AGREEMENT is made and entered into in _____,
California, this ___ day of _____, by and between _____
_____, hereinafter referred to as "Owner" and the CITY OF _____
_____, a municipal corporation, located in the County of Ventura,
State of California hereinafter referred to as "CITY";

WHEREAS, the Owner owns real property ("Property") in the City of _____,
County of Ventura, State of California, more specifically described in Exhibit "A" and
depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated
herein by this reference;

WHEREAS, at the time of initial approval of development project known as _____
_____ within the Property described
herein, the City required the project to employ on-site control measures to minimize
pollutants in urban runoff;

WHEREAS, the Owner has chosen to install a _____
_____, hereinafter
referred to as "Device", as the on-site control measure to minimize pollutants in
urban runoff;

WHEREAS, said Device has been installed in accordance with plans and
specifications accepted by the City;

WHEREAS, said Device, with installation on private property and draining only private property, is a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of Device and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

- 1) Owner hereby provides the City of City's designee complete access, of any duration, to the Device and its immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.
- 2) Owner shall use its best efforts diligently to maintain the Device in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of material(s) from the Device and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.
- 3) In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.
- 4) The City may require the owner to post security in form and for a time period satisfactory to the city of guarantee of the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous stormwater related approval with respect to the

APPENDIX H: STORMWATER CONTROL MEASURES ACCESS AND MAINTENANCE AGREEMENTS

property on which a Device has been installed until such time as Owner repays to City it's reasonable costs incurred in accordance with paragraph 3 above.

- 5) This agreement shall be recorded in the Office of the Recorder of Ventura County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.
- 6) In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.
- 7) It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.
- 8) The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.
- 9) Time is of the essence in the performance of this Agreement.
- 10) Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IF TO CITY:

IF TO OWNER:

EXHIBIT A

(Legal Description)

EXHIBIT B

(Map/illustration)

(Short Form)

Recorded at the request of and mail to:



Covenant and Agreement Regarding

Stormwater Treatment Device Maintenance

The undersigned hereby certify that we are the owners of hereinafter legally described real property located in the City of _____, County of Ventura, State of California.

Legal Description: _____

as recorded in Book _____, Page _____, Records of Ventura County,

which property is located and known as **(Address):** _____

And in consideration of the City of _____ allowing _____

on said property, we do hereby covenant and agree to and with said City to maintain according to the Maintenance Plan (Attachment 1), all structural stormwater treatment devices including the following:

This Covenant and Agreement shall run all of the above described land and shall be binding upon ourselves, and future owners, encumbrances, their successors, heirs, or assignees and shall continue in effect until released by the authority of the City upon submittal of request, applicable fees, and evidence that this Covenant and Agreement is no longer required by law.

NOTARIES ON FOLLOWING PAGE

APPENDIX I : STORMWATER CONTROL MEASURE MAINTENANCE PLAN GUIDELINES AND CHECKLISTS

Included in this appendix are a series of checklists that can be used by both inspectors and maintenance personnel to ensure that observed deficiencies in BMPs are maintained appropriately. The BMP Inspection/Maintenance Checklists are presented in the following order:

- 1) [Bioretention/Planter Box](#)
- 25) [Vegetated Swale Filter](#)
- 26) [Vegetated Filter Strip](#)
- 27) [Sand Filter](#)
- 28) [Infiltration BMPs](#)
- 29) [Permeable Pavement](#)
- 30) [Constructed Treatment Wetland](#)
- 31) [Wet Retention Basin](#)
- 32) [Dry Extended Detention Basin](#)
- 33) [Proprietary Devices](#)

I.1 Bioretention/Planter Box Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash, plant litter and dead leaves accumulated on surface.			
Vegetation	Unhealthy plants and appearance.			
Irrigation	Functioning incorrectly (if applicable).			
Inlet	Inlet pipe blocked or impeded.			
Splash Blocks	Blocks or pads correctly positioned to prevent erosion.			
Overflow	Overflow pipe blocked or broken.			
Filter media	Infiltration design rate is met (e.g., drains 36-48 hours after moderate - large storm event).			

[†]Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.2 Vegetated Swale Filter Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash and debris accumulated in the swale.			
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation start to take over.			
Excessive Shading	Vegetation growth is poor because sunlight does not reach swale. Evaluate vegetation suitability.			
Poor Vegetation Coverage	When vegetation is sparse or bare or eroded patches occur in more than 10% of the swale bottom. Evaluate vegetation suitability.			
Sediment Accumulation	Sediment depth exceeds 2 inches or covers more than 10% of design area.			
Standing Water	When water stands in the swale between storms and does not drain freely.			
Flow spreader or Check Dams	Flow spreader or check dams uneven or clogged so that flows are not uniformly distributed through entire swale width.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Constant Baseflow	When small quantities of water continually flow through the swale, even when it has been dry for weeks and an eroded, muddy channel has formed in the swale bottom.			
Inlet/Outlet	Inlet/outlet areas clogged with sediment and/or debris.			
Erosion/ Scouring	Eroded or scoured swale bottom due to flow channelization, or higher flows. Eroded or rilled side slopes.			
	Eroded or undercut inlet/outlet structures			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.3 Vegetated Filter Strip Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2) [†]	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash and debris accumulated on the filter strip.			
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.			
Excessive Shading	Grass growth is poor because sunlight does not reach swale. Evaluate grass species suitability.			
Poor Vegetation Coverage	When grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom. Evaluate grass species suitability.			
Erosion/Scouring	Eroded or scoured areas due to flow channelization, or higher flows.			
Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.			
Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire filter width.			

[†]Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.4 Sand Filter Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet of filter bed area (one standard garbage can). In general, there shall be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.			
Inlet erosion	Visible evident of erosion occurring near flow spreader outlets.			
Slow drain time	Standing water long after storm has passed (after 24 to 48 hours) and/or flow through the overflow pipes occurs frequently.			
Concentrated Flow	Flow spreader uneven or clogged so that flows are not uniformly distributed across the sand filter.			
Appearance of poisonous, noxious or nuisance vegetation	Excessive grass and weed growth. Noxious weeds, woody vegetation establishing, Turf growing over rock filter			
Standing Water	Standing water long after storm has passed (after 24 to 48 hours), and/or flow through the overflow pipes occurs frequently.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Tear in Filter Fabric	When there is a visible tear or rip in the filter fabric allowing water to bypass the fabric.			
Pipe Settlement	If piping has visibly settled more than 1 inch.			
Filter Media	Drawdown of water through the media takes longer than 1 hour and/or overflow occurs frequently.			
Short Circuiting	Flows do not properly enter filter cartridges.			

[†]Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.5 Infiltration BMP Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance, vegetative health	Mowing and trimming vegetation is needed to prevent establishment of woody vegetation, and for aesthetic and vector reasons.			
Vegetation	Poisonous or nuisance vegetation or noxious weeds.			
	Excessive loss of turf or ground cover (if applicable).			
Trash & Debris	Trash and debris > 5 cf/1,000 sf (one standard size garbage can).			
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.			
Erosion	Undercut or eroded areas at inlet or outlet structures.			
Sediment and Debris	Accumulation of sediment, debris, and oil/grease on surface, inflow, outlet or overflow structures.			
Sediment and Debris	Accumulation of sediment and debris, in sediment forebay and pretreatment devices.			
Water drainage rate	Standing water, or by visual inspection of wells (if available), indicates design drain times are not being achieved (i.e., within 72 hours).			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Media clogging surface layer	Lift surface layer (and filter fabric if installed) and check for media clogging with sediment (function may be able to be restored by replacing surface aggregate/filter cloth).			
Media clogging	Lift surface layer (and filter fabric if installed) and check for media clogging with sediment (partial or complete clogging which may require full replacement).			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.6 Permeable Pavement Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Sediment Accumulation	Sediment is visible			
Missing gravel/sand fill	There are noticeable gaps in between pavers			
Weeds/mosses filling voids	Vegetation is growing in/on permeable pavement			
Trash and Debris Accumulation	Trash and debris accumulated on the permeable pavement.			
Dead or dying vegetation in adjacent landscaping	Vegetation is dead or dying leaving bare soil prone to erosion			
Surface clog	Clogging is evidenced by ponding on the surface			
Overflow clog	Excessive build up of water accompanied by observation of low flow in observation well (connected to underdrain system) If a surface overflow system is used, observation of an obvious clog			
Visual contaminants and pollution	Any visual evidence of oil, gasoline, contaminants or other pollutants.			
Erosion	Tributary area Exhibits signs of erosion Noticeably not completely stabilized			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Deterioration/ Roughening	Integrity of pavement is compromised (i.e., cracks, depressions, crumbling, etc.)			
Subsurface Clog	Clogging is evidenced by ponding on the surface and is not remedied by addressing surface clogging.			
[†] Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.				

I.7 Constructed Treatment Wetland Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 sf of basin area (one standard garbage can). In general, there shall be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance. If trash and debris is observed blocking or partially blocking an outlet structure or inhibiting flows between cells, it shall be removed quickly			
Sediment Accumulation	Sediment accumulation in basin bottom that exceeds the depth of sediment zone plus 6 inches in the sediment forebay. If sediment is blocking an inlet or outlet, it shall be removed.			
Erosion	Erosion of basin's side slopes and/or scouring of basin bottom.			
Oil Sheen on Water	Prevalent and visible oil sheen.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Noxious Pests	Visual observations or receipt of complaints of numbers of pests that would not be naturally occurring and could pose a threat to human or aquatic health.			
Water Level	First cell empty, doesn't hold water.			
Aesthetics	Minor vegetation removal and thinning. Mowing berms and surroundings			
Noxious Weeds	Any evidence of noxious weeds.			
Tree Growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering, do not remove. Dead, diseased, or dying trees shall be removed.			
Settling of Berm	If settlement is apparent. Settling can be an indication of more severe problems with the berm or outlet works. A geotechnical engineer shall be consulted to determine the source of the settlement if the dike/berm is serving as a dam.			
Piping through Berm	Discernable water flow through basin berm. Ongoing erosion with potential for erosion to continue. A licensed geotechnical engineer shall be called in to inspect and evaluate condition and recommend repair of condition.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Tree and Large Shrub Growth on Downstream Slope of Embankments	Tree and large shrub growth on downstream slopes of embankments may prevent inspection and provide habitat for burrowing rodents.			
Erosion on Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			
Gate/Fence Damage	Damage to gate/fence, including missing locks and hinges			
[†] Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.				

I.8 Wet Retention Basin Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 sf of basin area (one standard garbage can) or if trash and debris is excessively clogging the outlet structure. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.			
Sediment Accumulation	Sediment accumulation in basin bottom that exceeds the depth of the design sediment zone plus 6 inches, usually in the first cell.			
Erosion	Erosion of basin's side slopes and/or scouring of basin bottom.			
Oil Sheen on Water	Prevalent and visible oil sheen.			
Noxious Pests	Visual observations or receipt of complaints of numbers of pests that would not be naturally occurring and could pose a threat to human or aquatic health.			
Water Level	First cell empty, doesn't hold water.			
Algae Mats	Algae mats over more than 20% of the water surface.			
Aesthetics	Minor vegetation removal and thinning. Mowing berms and surroundings			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) [†]	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Noxious Weeds	Any evidence of noxious weeds.			
Tree Growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering, do not remove. Dead, diseased, or dying trees shall be removed.			
Settling of Berm	If settlement is apparent. Settling can be an indication of more severe problems with the berm or outlet works. A geotechnical engineer shall be consulted to determine the source of the settlement if the dike/berm is serving as a dam.			
Piping through Berm	Discernable water flow through basin berm. Ongoing erosion with potential for erosion to continue. A licensed geotechnical engineer shall be called in to inspect and evaluate condition and recommend repair of condition.			
Tree and Large Shrub Growth on Downstream Slope of Embankments	Tree and large shrub growth on downstream slopes of embankments may prevent inspection and provide habitat for burrowing rodents.			
Erosion on Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			
Gate/Fence Damage	Damage to gate/fence, including missing locks and hinges			

[†]Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.9 Dry Extended Detention Basin Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
General				
Appearance	Untidy, un-mown (if applicable)			
Vegetation	Access problems or hazards; dead or dying trees			
	Poisonous or nuisance vegetation or noxious weeds			
Insects	Insects such as wasps and hornets interfere with maintenance activities.			
Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes			
Trash and Debris	Trash and debris > 5 cf/1,000 sf (one standard size garbage can).			
Pollutants	Any evidence of oil, gasoline, contaminants or other pollutants			
Inlet/Outlet Pipe	Inlet/Outlet pipe clogged with sediment and/or debris. Basin not draining.			
Erosion	Erosion of the basin's side slopes and/or scouring of the basin bottom that exceeds 2-inches, or where continued erosion is prevalent.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Piping	Evidence of or visible water flow through basin berm.			
Settlement of Basin Dike/Berm	Any part of these components that has settled 4-inches or lower than the design elevation, or inspector determines dike/berm is unsound.			
Overflow Spillway	Rock is missing and/or soil is exposed at top of spillway or outside slope.			
Sediment Accumulation in Basin Bottom	Sediment accumulations in basin bottom that exceeds the depth of sediment zone plus 6-inches.			
Tree or shrub growth	Trees > 4 ft in height with potential blockage of inlet, outlet or spillway; or potential future bank stability problems			
Debris Barriers (e.g., Trash Racks)				
Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.			
Damaged/ Missing Bars	Bars are bent out of shape more than 3 inches.			
	Bars are missing or entire barrier missing.			
	Bars are loose and rust is causing 50% deterioration to any part of barrier.			
Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe.			
Fencing				
Missing or broken parts	Any defect in the fence that permits easy entry to a facility.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Erosion	Erosion more than 4 inches high and 12-18 inches wide, creating an opening under the fence.			
Damaged Parts	Damage to gate/fence, posts out of plumb, or rails bent more than 6 inches.			
Deteriorating Paint or Protective Coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.			
Gates				
Damaged or missing member	Missing gate or locking devices, broken or missing hinges, out of plum more than 6 inches and more than 1 foot out of design alignment, or missing stretcher bar, stretcher bands, and ties.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.10 Proprietary Device Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: post-storm annual routine post-wet season pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Refer to the manufacturer's instructions for maintenance/inspection requirements, below are generic guidelines to supplement manufacturer's recommendations.				
Underground Vault				
Sediment Accumulation on Media	Sediment depth exceeds 0.25-inches.			
Sediment Accumulation in Vault	Sediment depth exceeds 6-inches in first chamber.			
Trash/Debris Accumulation	Trash and debris accumulated on compost filter bed.			
Sediment in Drain Pipes or Cleanouts	When drain pipes, clean-outs, become full with sediment and/or debris.			
Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.			
Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure, corrosion/deformation of cover.			
Vault Structure Includes Cracks in Wall, Bottom, Damage to	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.			

APPENDIX I: STORMWATER BMP MAINTENANCE PLAN GUIDANCE AND CHECKLISTS

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Frame and/or Top Slab	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.			
Baffles	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.			
Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, or misaligned.			
Below Ground Cartridge Type				
Filter Media	Drawdown of water through the media takes longer than 1 hour and/or overflow occurs frequently.			
Short Circuiting	Flows do not properly enter filter cartridges.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

ATTACHMENT 53



*Ventura Countywide
Stormwater Quality
Management Program*

**2011-2012
Permit Year**

Ventura Countywide Stormwater Quality Management Program Annual Report



December 15, 2012

Camarillo
County of Ventura
Fillmore
Moorpark
Ojai
Oxnard
Port Hueneme
Santa Paula
Simi Valley
Thousand Oaks
Ventura
Ventura County Watershed Protection
District

Prepared Under the Direction of:

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Attachment A	Commercial and Industrial Inspection Checklists
Attachment B	Post Construction BMP Inspection Checklist
Attachment C	Construction Inspection Checklist
Attachment D	Illicit Discharge Field Screening Protocol
Attachment E	Water Quality Monitoring Appendices

Executive Summary

This Annual Report discusses the Permittees' Permit compliance activities for the period of July 1, 2011 to June 30, 2012, the second year of the Permit. It includes a description of all activities conducted during the reporting period and the efforts made to improve water quality throughout Ventura County by the Permittees. The purpose of this report is to both show compliance with NPDES Permit No. CAS004002/Order No. 10-108 (Permit), and meet the reporting requirement which requires an Annual Stormwater Report submitted by December 15th of each year. Since the Permit did not require a Stormwater Management Plan this report also serves as a way to clarify the Permit's requirements and the effort necessary to meet them. Finally, program effectiveness assessment of the implementation of the permit requirements are examined with potential areas for improvement identified.

The cooperation and effort of the Ventura Countywide Permittees, who contributed the information and data regarding their various programs, was instrumental in the preparation of this report. The Permittees cooperate through the Program to ensure information and workloads are shared, economies of scale achieved and a better Countywide Stormwater Quality Management Program is created. The Permittees through implementation of various comprehensive program elements have strived for improved water quality through compliance with all requirements of the Permit.

Notable accomplishments made by the Permittees and the Program over this reporting period include:

- Began a comprehensive data analysis effort, aiming to identify historical trends in water quality and pollutants of concern to receiving waters.
- Implemented the first phase of a pyrethroid study that showed no significant sediment toxicity or concentrations approaching levels of pyrethroids known to be toxic;
- Initiated development of a long term strategic plan for addressing water quality issues in the County including identifying the goals and objectives that will ensure success when accomplished;
- Responded to elevated levels of pentachlorophenol at an urban outfall with a special investigation that conclusively found the source, and initiated a partnership in a multi-agency effort to eliminate the discharge.
- Implementation of a revised Technical Guidance Manual for new and significant re-development including providing an electronic application tool for projects to determine applicability and calculate retention volumes;
- In-school outreach rallies done at 26 schools to over 23,000 students with the cooperation of local radio station Q104.7;
- Participation in the statewide Coastal Cleanup Day Event at 24 different beaches and inland waterways;
- Offsite compliance program options for developments that prove technical infeasibilities to onsite LID;
- The Stormwater Monitoring Program was able to achieve a 91.8% success rate in meeting program data quality objectives;

- Continued program improvement through implementation of the recommendations of a detailed program efficiency audit of the Principal Permittee;
- Participation in Stormwater Monitoring Coalition of Southern California, Southern California Coastal Water Research Project (SCCWRP), and CASQA;
- Cooperation and commitment to SCCWRP to aid in a hydromodification effects study.

This year the Stormwater Monitoring Program modified its application of the California Toxics Rule (CTR) Numeric Criteria for Priority Toxic Pollutants to determine water quality exceedances in receiving waters. The driver for this change was the inconsistent application of acute and chronic criteria in the past. The new approach is more consistent with other stormwater agencies in southern California, and provides more consistent protection of beneficial uses.

The Stormwater Monitoring Program detected Aluminum, *E. coli*, and fecal coliforms at elevated levels at most sites during wet-weather events, but with the exception of *E. coli*, rarely during dry-weather events. Other constituents that were found at elevated levels during the 2011/12 monitoring season include chloride and total dissolved solids (predominantly during the dry-weather event); dissolved oxygen; dissolved copper; and pH (dry weather). Constituents that were seen at elevated levels at Major Outfalls only once during the season include total chromium, bis(2-ethylhexyl)phthalate, benzo(a)pyrene, and pentachlorophenol; and at Mass Emission stations only once during the year the metals (total) barium, cadmium, chromium, and nickel. In the Water Quality Monitoring Section of this year's report is an analysis of the historical mass emission data done to identify statistically significant trends. This analysis shows improvement in water quality identified through the Program's monitoring program, helps identify Pollutants of Concern, and will be used to direct the Program's efforts.

Continued in this Annual Report are the Performance Standards for specific Permit requirements identified in each section along with the Permittees' status on achieving that standard. Permit compliance cannot be directly inferred solely by these Performance Standards as the complete effort of the Permittees cannot be reflected through these discrete metrics. Rather, the information is more suitable for use by for the Permittees to gage their efforts and identify areas of needed improvement.

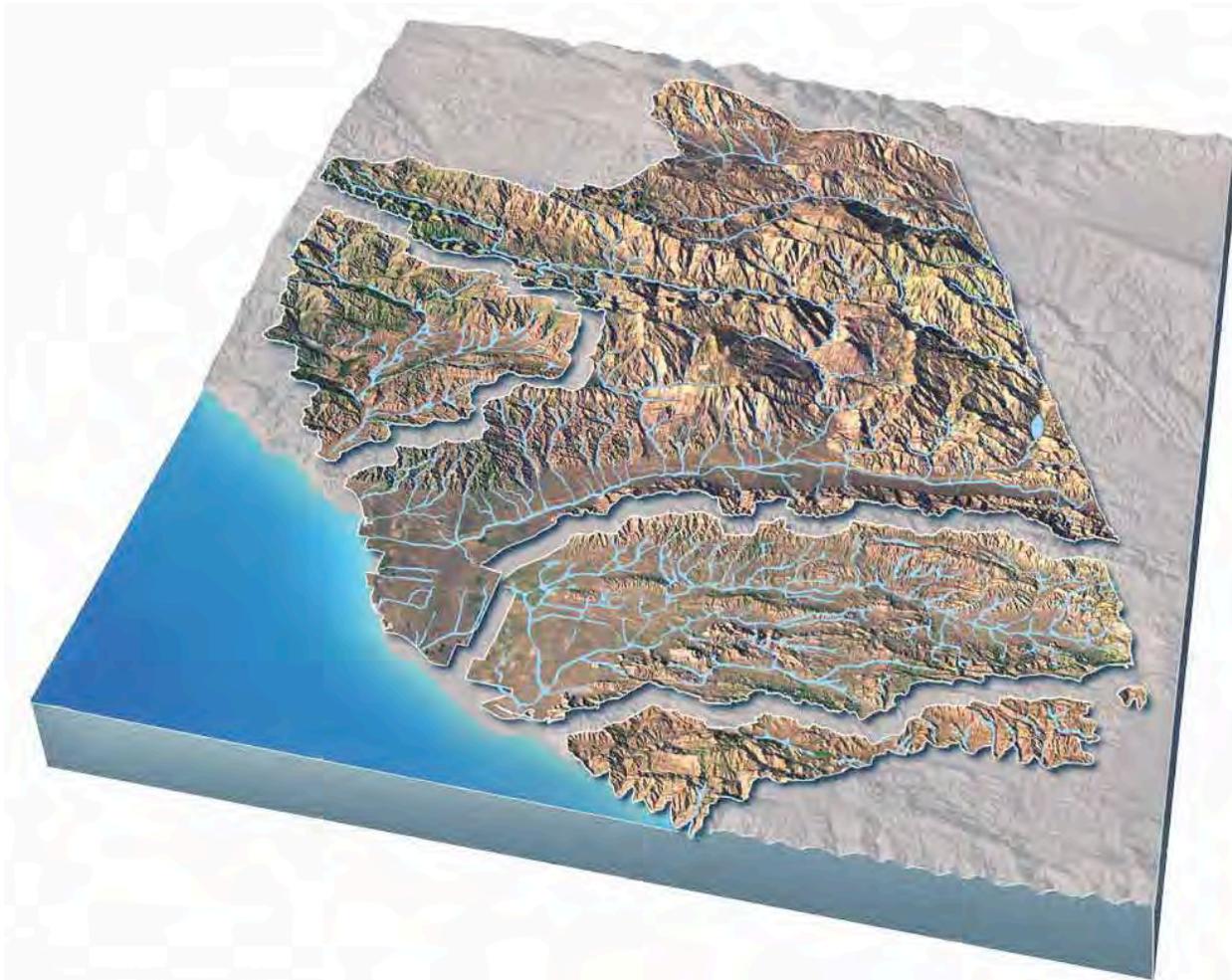
The Program has adopted a method for assessing program effectiveness based on California Stormwater Quality Association's (CASQA) six progressive outcome levels for the effectiveness assessment which range from documenting efforts to measurably protecting receiving water quality. Current program effectiveness measurements show the Program is continually effective in the first two outcome levels of documenting efforts and raising awareness. As implementation of the Program continues, improvements in the ability to measure the other outcome levels of changing behavior and reducing pollutant loads will be accurately measured and documented. The trends identified in the Water Quality Monitoring Section show real progress towards the Program's effectiveness at the ultimate goal - Outcome Level 6 protecting receiving water quality.

In summary, the Permittees continue aggressively moving forward to improve stormwater quality and eliminate dry weather flows. Each program element has a subcommittee working to develop needed forms, protocols, and procedures to ensure future permit compliance. The programs, methods and this report are continually being refined to improve effectiveness, apply lessons learned, identify and address additional sources of stormwater pollutants, and therefore water quality. Future program activities will include initiating an offsite compliance program for developments that prove technical infeasibilities and incorporating hydromodification control plans into the Technical Guidance Manual, increased analysis of the urban outfall monitoring data generated for each Permittee, and development of a long term strategic plan for addressing water quality issues in the County, including identifying the goals and objectives that will ensure success when accomplished.

1 Introduction

The Watershed Protection District (Principal Permittee), the County of Ventura, and the incorporated cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Ventura, Santa Paula, Simi Valley, and Thousand Oaks, (each a Permittee, and collectively known as Permittees) operate municipal storm drain systems and discharge stormwater and urban runoff pursuant to the countywide NPDES permit (Board Order No. 10-0108 or Permit). This Permit, administered by the Los Angeles Regional Water Quality Control Board (RWQCB), requires an Annual Stormwater Report and Assessment (Annual Report) be submitted by December 15th of each year.

The first stormwater permit for Ventura County was adopted in 1994 and included all ten cities, the County, and the Watershed Protection District. On July 27, 2000 a second permit was adopted that included logical and incremental increases in the requirements. That five-year permit was on administrative extension until May 7, 2009, when Board Order 09-0057 was adopted. Shortly after adoption of that permit the Regional Board rescinded it to hold a new adoption hearing. On July 8, 2010 Order No. R4 2010-0108 was adopted with minor changes. The 2010 Permit had a new set of implementation deadlines associated with it and replaced the order adopted in 2009 in its entirety.



***The Watersheds of Ventura County:
Ventura River, Santa Clara River, Calleguas Creek, and Malibu Creek***

1.1 PURPOSE AND ORGANIZATION OF REPORT

The primary purpose of this report is to document the Permittees' continued efforts to improve water quality and comply with the Permit. Since the Permit did not require a Stormwater Management Plan this report also serves as a way to clarify the Permit's requirements and the effort required to meet them. Finally, program effectiveness assessment of the implementation of the permit requirements are examined with potential areas for improvement identified.

The organization of the report reflects the organization of the Permit. Each section contains a description of the permit requirements and their purpose, the Permittee's program activities in that area with detailed descriptions of the efforts put forth in the 2011/12 permit year. The sections are as follows:

- **Program Management - Section 2.0** – Roles and responsibilities of the Permittees committee structure, and a program budget report for 2012/13.
- **Public Information and Public Participation Program – Section 3.0** - The efforts and effectiveness of pollution prevention education and outreach programs.
- **Industrial Commercial Business Program - Section 4.0** – The activities directed at effectively prohibiting non-stormwater discharges from businesses and industrial sites in order to reduce stormwater pollution to the maximum extent practicable.
- **Planning and Land Development Program - Section 5.0** – The minimization of the impact of new development and significant redevelopment on stormwater quality through use of Low Impact Development site design and water quality treatment BMPs.
- **Development Construction Program - Section 6.0** – Activities before and during construction through stormwater pollution prevention plans and inspections to ensure the protection of stormwater quality to the maximum extent practicable.
- **Public agencies Activities Program - Section 7.0** – Both the efforts to remove pollutants from MS4s, and to eliminate the adverse effects that municipal activities may have on water quality.
- **Illicit Discharge and Illegal Connections Elimination Program - Section 8.0** – Status of the tools, control measures and responses established to eliminate non-permit authorized discharges and connections to the storm drain system.
- **Water Quality Monitoring Program - Section 9.0** – A summary and analysis of the monitoring results from the Permit year. Includes a report describing efforts that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of Water Quality Objectives.

1.1.1 Major Program Accomplishments

Notable accomplishments that occurred during the reporting period include:

- Trends analysis of historic data mass emission data to success in reduction of pollutants of concern and identify potential emerging concerns;
- Pyrethroid study showing no significant toxicity or elevated levels of pyrethroids downstream of urban areas;
- Initiated development of a long term strategic plan for addressing water quality issues in the County including identifying the goals and objectives that will ensure success when accomplished;
- Response to elevated levels of pentachlorophenol at an urban outfall with a special investigation that conclusively found the source, and initiated a partnership in a multi-agency effort to eliminate the discharge;
- Implementation of a revised Technical Guidance Manual for new and significant re-development including providing an electronic application tool for projects to determine applicability and calculate retention volumes;
- In-school outreach rallies done at 26 schools to 23000 students with the cooperation of local radio station Q104.7;
- Participation in the statewide Coastal Cleanup Day Event at 24 different beaches and inland waterways;
- Offsite compliance program options for developments that prove technical infeasibilities to onsite LID;
- Continued program improvement through implementation of the recommendations of a detailed program efficiency audit of the Principal Permittee;
- Regional TMDL participation;
- Participation in the Stormwater Monitoring Coalition of Southern California, Southern California Coastal Water Research Project (SCCWRP), and CASQA;
- Cooperation and commitment to SCCWRP to aid in a hydromodification effects study;
- Integrated Regional Water Management Plan (IRWMP) Participation.

1.2 PROGRAM EFFECTIVENESS ASSESSMENT

The 2011/12 Annual Report documents the Program's comprehensive stormwater quality efforts that address a wide range of activities. Various Departments in each Permittee's agency cooperate in implementing the different elements or activities of the Program under their control. All of these efforts are examined for program effectiveness.

Each of the six Program Elements contains various Control Measures. Each Control Measure consists of a series of Performance Measures. Performance Measures are identified to document the progress of implementation and to measure the effectiveness of implemented BMPs.

The Program has adopted a method for assessing program effectiveness based on an approach developed by the California Stormwater Quality Association (CASQA). The effectiveness assessment is more comprehensive than assessments under past permits and addresses the major stormwater program areas and activities. The outcome levels represent ways in which the effectiveness of the program can be determined, even if it is intermediate¹.

Outcome levels help to categorize and describe the desired results of the Program Elements and related Control Measures. Pursuant to the 2007 CASQA guidance, outcomes for stormwater programs have been categorized into six levels, as shown in Figure 1-1. As illustrated, there are six outcome levels for the effectiveness assessment. The outcome levels help to categorize and describe the desired results or goals of the program.

Figure 1-1 Effectiveness Assessment Outcome Levels

Implementation Assessment	Target Audience & Source Assessment			Urban Runoff & Receiving Water Assessment	
	Outcome Level 2	Outcome Level 3	Outcome Level 4	Outcome Level 5	Outcome Level 6
<p>Outcome Level 1</p> <p>Stormwater Program Activities</p> <ul style="list-style-type: none"> ▪ Facilitation activities ▪ Feedback activities ▪ Administrative activities 	<p>Knowledge & Awareness</p> <ul style="list-style-type: none"> ▪ Knowledge ▪ Awareness ▪ Attitudes 	<p>Behavior (Action)</p> <ul style="list-style-type: none"> ▪ BMP Implementation ▪ Intermediary Behaviors <ul style="list-style-type: none"> ○ Information seeking ○ Pollution reporting ○ Participation and involvement ○ Administrative and procedural behaviors 	<p>Source Reductions</p> <ul style="list-style-type: none"> ▪ Source pollutant loads ▪ Site / source hydrology 	<p>Runoff Quality & Hydrology</p> <ul style="list-style-type: none"> ▪ Urban runoff quality ▪ Urban runoff hydrology 	<p>Receiving Water Conditions</p> <ul style="list-style-type: none"> ▪ Receiving water quality ▪ Hydromodification impacts ▪ Beneficial use protection
4. Integrated Assessment					

Within each individual program section (starting with Chapter 3), the effectiveness assessment identifies the outcome level(s) achieved, as well as any program modifications that have been identified because of the assessment. The assessment section is at the end of each chapter.

Some important points to remember about these effectiveness assessments include:

¹ California Stormwater Quality Association, *Municipal Program Effectiveness Assessment Guidance*, May 2007.

- The ability of a stormwater program to assess an outcome level tends to become progressively more difficult as you assess higher outcome levels (levels 4-6). This is because the higher outcome levels assess the impact that the Permittees have on water quality, which requires a much more robust dataset over an extended period of time.
- Outcome levels 1-3 (and sometimes 4) are typically assessed using program management data, whereas outcome levels 4-6 are assessed using physical and/or water quality monitoring data.
- Each program element may be assessed at one or more outcome levels based on the data and information available.

Through the annual reports the effectiveness assessment will be expanded and modified as necessary in order to report out on key items.

To assess our ultimate effectiveness of improvement in receiving water conditions, the Program started a comprehensive data analysis effort, aiming to identify historical trends in water quality, priority pollutants and their sources to receiving waters. As part of this year's report in Section 9 Water Quality Monitoring, the trend analysis methods and results are presented.

The findings of the Mass Emission trend analysis reveals since 2001 twenty-six constituents, including metals, bacteria, nutrients, salts and one pesticide, have shown decreased concentrations at one or more stations. Only five constituents exhibited increasing trends, each time at only one of the stations. None of these constituents with increasing trends are causing water quality exceedances based on Basin Plan and CTR numeric water quality criteria. There has been a decreased in the average number of dry weather exceedances since 2001 at ME-SCR and ME-VR/VR2. The number of wet event exceedances has also decreased since 2004 at ME-CC and ME-VR, however this could be mostly explained by the smaller storm sizes and therefore fewer exceedances for metals in recent years.

These decreasing trends are good news for the environment and the Program, but still leave some questions. By following up to identify what causal agents are behind the trends then success can be repeated, problems avoided and a truly effective stormwater program created.

**Outcome Level 6 has
already been observed in
receiving waters.**

**Concentrations of nine
metals, E. coli, nutrients,
salts, and one pesticide
have significantly
trended downward since
2001.**

2 Program Management

2.1 PROGRAM IMPLEMENTATION

2.1.1 Mission Statement

To improve the focus and guide the actions of the program a mission statement was adopted by the Management Committee. Its purpose is to identify the overall goal, provide a sense of direction, and guide decision-making. It provides the framework or context within which the Program's strategies are guided. The Program's mission statement is below:

The Ventura Countywide Stormwater Quality Management Program, established in 1992 between the ten Cities, the County and District, works cooperatively on a regional basis to ensure compliance with the countywide Stormwater Permit through the development and implementation of an integrated, effective and fiscally responsible stormwater quality management program with the objective of protecting, maintaining and improving water quality in Ventura County for the common benefit of its residents and the environment.

2.1.2 Program Implementation

In 1992 the concept of a single countywide NPDES MS4 Stormwater Permit (Permit) was implemented in Ventura County. This began with the initial Report of Waste Discharge and the authorization to use the Watershed Protection District's Benefit Assessment to finance the activities and program efforts. Subsequently, on June 30, 1992, the District (as the Permit's Principal Permittee) entered into four separate District-zone-based implementation agreements with the ten Ventura County cities and the unincorporated areas of the county (the Permittees). Collectively, these four agreements are known as the Implementation Agreement for the Ventura Countywide Stormwater Quality Management Program. The Implementation Agreement identified the responsibilities of the Permittees and set forth the methodology for using the District's Benefit Assessment financing to fund the NPDES Stormwater Programs.

With the adoption of the second NPDES Permit, the Principal Permittee Program activities, responsibilities, and associated costs increased significantly. The District could no longer solely shoulder these fiscal obligations without assistance from the Permittees. In response, the Permittees' Public Works Directors created a committee to research the historical documentation from the District's Benefit Assessment Reports and draft a new implementation agreement.

In FY 2007/08, the first amendment to the agreement was approved to address this needed cost-sharing by amending the original agreement. In FY 2008/09 and 2009/10, the second and third amendments to the original agreement were approved to continue this needed cost-sharing.

The additional program costs for the Principal Permittee and Permittees associated with the 2010 NPDES Permit prompted further effort among the Public Works Directors to equitably share the increased costs. The result of that effort was a new NPDES Implementation Agreement to supersede the original agreement and amendments.

The Implementation Agreement defines the fiscal responsibilities (expenditures and contributions) of all collective parties with respect to the current Permit. It formalizes the Permittees' commitment to cooperate and to mutually fund an integrated Program for protecting and improving water quality in Ventura County.

2.2 PERMITTEE RESPONSIBILITIES

The responsibilities of the Principal Permittee and Permittees are defined within the Permit and the Implementation Agreement. These roles and responsibilities are outlined below.

2.2.1 Permittees

Each Permittee is responsible for implementing the NPDES Stormwater Program and Permit compliance within their jurisdiction. The main responsibility of each Permittee can be identified as follows:

- Comply with the requirements of the Permit through implementation within its jurisdiction of the various stormwater management programs outlined in the Permit;
- Coordinate among its internal departments and agencies, as necessary, to facilitate the implementation of the requirements of this Permit applicable to such Permittees in an efficient and cost-effective manner;
- Participate in intra-agency coordination (e.g., Planning Department, Fire Department, Building and Safety, Code Enforcement, Public Health, Parks and Recreation, and others) necessary to effectively implement the provisions of the Permit;
- Prepare and submit all reports or requests of information to the Principal Permittee in a timely fashion;
- Review, provide comments, and approve Program budgets, plans, strategies, management programs, and monitoring programs developed by the Principal Permittee or any subcommittee;
- Establish and maintain adequate legal authority;
- Apply appropriate enforcement actions as necessary within its jurisdictions to ensure compliance with applicable ordinances;
- Respond to, or arrange for, response to emergency situations, such as accidental spills, leaks, illicit discharges/illegal connections, etc., to prevent or reduce the discharge of pollutants to the storm drain systems and waters of the U.S. within its jurisdiction
- Conduct inspections of, and perform maintenance on, municipal infrastructure within its jurisdiction;
- Conduct and coordinate any surveys and source identification studies necessary to identify pollutant sources and drainage areas; and
- Participate in the Management Committee.

2.2.2 Principal Permittee

The role of the Principal Permittee is similar to the other Permittees with the addition of certain overall programmatic and facilitation responsibilities. These responsibilities do not include ensuring the compliance of the Permittees, as the Principal Permittee has no regulatory authority over the Permittees. The responsibilities outlined in the Permit include the following:

- Coordinate and facilitate activities necessary to comply with the requirements of the Permit;
- Act as liaison between the Permittees and the Regional Water Board on permitting issues;
- Provide for countywide consistency and program coordination;
- Provide technical and administrative support for subcommittees organized to implement this Order and its requirements;

- Convene the Committee Meetings constituted pursuant to Permit, upon designation of representatives;
- Implement a Public Information and Participation Program (PIPP) including developing a strategy to educate ethnic communities through culturally effective methods, and a plan to provide outreach in lieu of the school curriculum;
- Implement the monitoring program required in Attachment F of the Permit;
- Participate in the County Environmental Crimes Task Force;
- Provide resources for the collection, processing and submittal to the Regional Water Board of monitoring and annual reports, and summaries of other reports required under this Order. Establish uniform data submittal format and develop an Electronic Reporting Program;
- Participate in water quality meetings for watershed management and planning;
- Participate in the Southern California Storm Water Monitoring Coalition (SMC) Southern California Regional Bioassessment Monitoring Program
- Compile and make available on the internet a list of the general public reporting contacts; and
- Convene all Management Committee meetings.

In addition to responsibilities identified in the Permit, the Principal Permittee also performs the following for the benefit of the Program:

- Prepare communications, regulatory reports and submissions to the Regional Board;
- Provide Regional Representation for the Program and communicate information to the Permittees;
- Arrange for public access and review of Program plans and documents;
- Secure services of consultants as necessary;
- Implement activities of common interest to the Program;
- Develop/prepare/generate all materials and data common to all Permittees; and
- Update Permittees on RWQCB and US Environmental Protection Agency (USEPA) regulations.

2.3 MANAGEMENT ACTIVITIES

2.3.1 Management Committee

The NPDES Management Committee is the principal forum for directing the Program's development and implementation. This Committee is attended by senior staff from all Permittee agencies and meets monthly to assure Program continuity. Committee members have been authorized by their Director of Public Works as Management Committee Voting Representatives with the authority to approve Principal Permittee's budget and/or modifications. If no Representative is authorized, it is the Directors of Public Works responsibility to voice their opinion at meetings when these items are on the agenda. In addition to budgeting and program direction, this committee also periodically evaluates the need to create ad hoc committees or workgroups to develop tools and accomplish the objectives of the NPDES Stormwater Program. Although it is no longer

mandated that Permittees attend the meetings, participation in the Management Committee as necessary is a specific requirement of the Permit.

Performance Standard 2-1

<i>Participate in intra-agency coordination including Committee and Subcommittee Meetings to facilitate the implementation of the Permit</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>	<input checked="" type="checkbox"/>		
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>	<input checked="" type="checkbox"/>		
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		
<i>Watershed Protection</i>	<input checked="" type="checkbox"/>		

Subcommittees

The Subcommittees provide a forum for discussion of particular program elements and are attended by the staff with the appropriate expertise from each Permittee. These meetings allow for a more uniform approach and regional consistency to program management countywide. This helps provide a level playing field for businesses and residents countywide. More importantly it allows the Permittees to learn from each other and have access to tools that have already been developed. This is very beneficial for the smaller agencies which do not have at their disposal the resources available to the true Phase 1 cities (population over 100,000).

The subcommittees were created at the beginning of the program and have continued to meet and have evolved over the years as requirements and pollutant sources have changed. Subcommittee activities over this Permit Year have been devoted to identifying new Permit requirements and developing programs for compliance. Each subcommittee focuses on specific permit requirements and implementation programs. These generally follow the program sections of the permit, but the subcommittees also incorporate the whole permit in their analysis and integrated program development. The subcommittees and their program responsibilities are listed below. This list does not include any ad hoc, special project, or working groups that may have been formed by the Management Committee or from a logical outgrowth of the subcommittees. One such working group is the Capital Improvement Projects (CIP) Working Group set up to assist Permittees own capital improvement program engineers and staff to understand and implement the new post-construction requirements as well as the new General Construction Permit requirements in our public projects.

Residential/Public Outreach Subcommittee

The Principal Permittee’s countywide outreach program is guided by this subcommittee. Using information on pollutants identified through the monitoring program and 303(d) lists, this committee selects specific Pollutants of Concern to target each year and decides on the best methods of outreach and public education to influence a change in behavior, and regional message consistency.

Business and Illicit Discharge Control Subcommittee

Oversees the development of the model industrial/commercial and illicit discharge/illegal connections programs. Countywide consistency is created by developing inspection forms and sharing techniques and methods of identifying and educating businesses and industries targeted for inspections. Outreach materials focused on specific industries and businesses are also developed for countywide use by all Permittees. Illicit discharge identification and responses are included at every meeting and discussed. Enforcement experiences are shared to further the education of inspectors countywide.

Planning and Land Development Subcommittee

Planners and development engineers work together to provide regional tools for design, review, and conditioning of new development and redevelopment projects, and to promote regional consistency in

their application. Guidance and training are developed for the development community for the implementation of stormwater management control measures countywide. The guidelines developed are intended to improve water quality and mitigate potential water quality impacts from new development and significant redevelopment.

Construction Subcommittee

Regional consistency for inspections and enforcement are provided by developing model inspection checklists and identifying solutions to common problems. Information on the State General Construction Permit issues, training requirements and opportunities are shared and disseminated to the construction community.

Public Infrastructure

This subcommittee assists municipalities in the protection of their storm drain infrastructure from pollutants through best management practices and the development of model municipal activities programs, corporate yard inspections, and integrated pesticide management programs. It also works to identify solutions to infrastructure mapping and other permit requirements.

The Permit requires Permittee participation in the subcommittees as necessary. The Permittees have been very involved in subcommittees this permit year, including stepping up to the chair position on four of the five subcommittees. The value of the subcommittees to improve staff knowledge and abilities, achieve economies of scale, and provide regional program consistency is understood by all members. It is recognized that increased effort in the subcommittees will be rewarded by improvement in staff, resources, and the overall program.

2.3.2 Other Regional Committees/Work Groups

Many of the Permittees additionally participate in various watershed management advisory groups. These groups include: the Ventura County Integrated Resources Water Management Plan (IRWMP), Ventura River Watershed Planning Committee, Santa Clara River Watershed Committee, Wetlands Recovery Project, Calleguas Creek Watershed Management Committee, Matilija Dam Ecosystem Restoration Study, Channel Islands Beach Park Action Plan for Improving Water Quality, Malibu Creek Watershed Management Committee and Technical Advisory Committee, Steelhead Restoration and Recovery Plan, Beach Erosion Authority for Clean Oceans and Nourishment (BEACON), Southern California Coastal Water Research Project (SCCWRP), Stormwater Monitoring Coalition of Southern California (SMC), and the Ormond Beach Task Force. These watershed and regional groups focus their activities and discussions on specific concerns such as water quality, habitat restoration and flood control, as well as short, medium, and long-term solutions to improve water quality.

2.3.3 Management Framework – Program Implementation

Program development occurs through the Permittee, Countywide Program, and watershed management frameworks. At a jurisdictional level the Permittees have formally identified which departments and staff have responsibility for implementation of each program element within their jurisdictions. It may be necessary for the responsibility to be formally documented through Memorandums of Understanding or other tools. Smaller agencies tend not to require such formal agreements between departments, and in some cases there may be only a few people who are involved in the implementation of all aspects of the stormwater program.

2.3.4 Legal Authority

Although adequate legal authority existed for most pollutant discharges at the inception of the stormwater program in 1994, the Permittees determined that a Model Stormwater Quality Ordinance should be developed

to provide a more uniform countywide approach and to provide a legal underpinning to the entire Ventura Countywide NPDES Stormwater Program.

Performance Standard 2-2

<i>Ensure that its Stormwater Quality and LID Ordinances authorize enforcement of all requirements of the Permit? (by July 8, 2012)</i>			
	<i>Yes</i>	<i>No</i>	<i>In Progress</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>			<input checked="" type="checkbox"/>
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>	<input checked="" type="checkbox"/>		
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>	<input checked="" type="checkbox"/>		
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		
<i>Watershed Protection</i>			<input checked="" type="checkbox"/>

Subsequently, all of the Permittees adopted largely similar versions of the initial Model Stormwater Quality Ordinance. With the adoption of the Order No. 10-0108 the municipal ordinances must be updated by July 8, 2012, outside of this reporting period. The Permittees, led by the City of Moorpark, have already begun the process of drafting a model ordinance which can serve as the basis for each Permittee to adopt and authorize them to enforce all requirements of the Permit. Preliminary review by Counsel for the Permittees have determined the existing ordinances are capable of enforcing the Permit, however will be made stronger through the adopting of an improved ordinance.

Enforcement of the current ordinance and the detection, investigation and elimination of discharges undertaken by the Permittees during 2011/12 are described further in Section 8 Illicit connections and Illicit Discharge Elimination. In addition to prohibiting un-permitted discharges, the Stormwater Quality Ordinance, in conjunction with the conditions of land development, provides for requiring BMPs on new development and significant redevelopment. Stormwater quality ordinances have been adopted in each Permittees' jurisdictions as indicated in

Table 2-1 Ordinance Adoption Dates. As stated above, the requirement to update these ordinances to be able to enforce the new permit is required by July 8, 2012, outside of this reporting period.

Table 2-1 Ordinance Adoption Dates

Ordinance Adoption Dates		
Co-permittee	Adopted Date	Amendment Date
Camarillo	3/11/1998	In Progress
County of Ventura	10/2/2001	7/17/2012
Fillmore	7/8/2012	7/8/2012
Moorpark	12/3/1997	2008
Ojai	2/9/1999	
Oxnard	3/24/1998	3/24/2009
Port Hueneme	4/1/1998	2/1/2001
San Buenaventura	1/11/1999	In Progress
Santa Paula	11/16/1998	2010
Simi Valley	7/2/2012	
Thousand Oaks	10/14/1999	

2.3.5 **Watershed Protection District Stormwater Program Representation**

To stay informed of new science and regulations and gain economies of scale through regional efforts the Principal Permittee represents the Permittees by participating in the following organizations and associations:

California Association for Stormwater Agencies (CASQA)

The California Association of Stormwater Quality Agencies originally formed as an advisory body to the State Water Resources Control Board (SWRCB) on stormwater quality program issues is now a 501 (c)(3) non-profit organization. CASQA membership is composed of a diverse range of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout the state. A large part of its mission is to assist stormwater quality programs in California to learn collectively from the individual experiences of its members, learn from their mistakes, and provide awareness of regional and state issues. Since its inception in 1989, CASQA has evolved into the leading organization in California dealing with stormwater quality issues.

Southern California Coastal Water Research Project (SCCWRP)

The Southern California Coastal Water Research Project (SCCWRP) is a joint powers agency formed by fourteen agencies through a unique partnership between municipalities that discharge treated wastewater to the ocean, stormwater agencies, and regulators that oversee dischargers. Members work together to develop a solid scientific foundation for coastal environment management in southern California. SCCWRP's mission is to gather the necessary scientific information so that member agencies can effectively and cost-efficiently protect the Southern California coastal and marine environment. In addition, SCCWRP's mission is to ensure that the data it collects and synthesizes effectively reaches decision-makers, scientists, and the public.

Stormwater Monitoring Coalition of Southern California (SMC)

The SMC participants are the Ventura County Watershed Protection District, the County of Orange, the County of San Diego, the Los Angeles County Flood Control District, the San Bernardino County Flood Control District, the Riverside County Flood Control and Water Conservation District, the City of Long Beach, the City of Los Angeles, the Regional Water Quality Control Boards of Los Angeles Region, Santa Ana Region, and San Diego Region, the Southern California Coastal Water Research Project (SCCWRP), and the California Department of Transportation. They have decided to work together in a cooperative effort to develop scientific and technical tools needed in southern California to improve stormwater program implementation, assessment, and monitoring.

California Coalition for Clean Water (CCCW)

The California Coalition for Clean Water (CCCW) is an alliance of local governments and public agencies, labor, agriculture, business, housing, and development interests working together towards the development and implementation of water quality standards that protect water quality while balancing economic and social needs of local communities and the state. CCCW's mission is to assist the California Regional Water Quality Control Boards and SWRCB to adopt and implement sound water quality standards that reflect the intent and spirit of state and federal clean water laws.

National and Global Organizations

As Principal Permittee, the Watershed Protection District (District) participated jointly with SCCWRP and various other federal and international organizations such as the Society of Environmental Toxicology and Chemistry (SETAC). SETAC is a nonprofit, worldwide professional society comprised of individuals and institutions engaged in the study, analysis, and solution of environmental problems. SETAC's mission is to support the development of principles and practices for protection, enhancement, and management of sustainable environmental quality and ecosystem integrity.

SETAC promotes the advancement and application of scientific research related to contaminants and other stressors in the environment, education in the environmental sciences, and the use of science in environmental policy and decision-making.

2.4 FISCAL ANALYSIS

The Permittees have committed significant resources to permit compliance, reducing stormwater pollution, and improving the water quality in Ventura County. This Section presents a summary of the costs anticipated for the coming permit year by the Permittees in developing, implementing, and maintaining programs in order to comply with permit requirements. Also included is information on the different funding sources used by the Permittees to ensure that resources are available for permit compliance. Since each permittee shares in the cost of the Principal program the total cost shown for each Permittee is the sum of those *shared* costs and their *individual* costs. However, in the grand total of all costs, including the Principal Permittee, these costs are not included to avoid the error of counting them twice.

2.4.1 Program Costs for Permit

With the new permit, costs of the Principal Program have increased significantly. The majority of this was due to the large increase in monitoring, but also the first year of the permit required new materials for businesses and land development communities. Cost for the Permittees' implementation also increased significantly but have tapered off from the first year. In 2010/11 the projected cost of the activities undertaken by the Permittees implementing the stormwater program within their jurisdictions were estimated to be \$31,910,727. This is a large increase over the budgets under the previous permit due to new programs, monitoring equipment and studies required. For FY 2011/12 the estimated costs for all permittees' expenses were still challenging at approximately \$19.5 million. For 2012/13 the estimated costs are about half of what they were a few years earlier, though still significant at \$16 million.

Performance Standard 2-3

<i>Document the costs to implement the stormwater program for Permit Year 2010/2011</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>	<input checked="" type="checkbox"/>		
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>	<input checked="" type="checkbox"/>		
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		
<i>Watershed Protection</i>	<input checked="" type="checkbox"/>		

2.4.1 Fiscal Resources

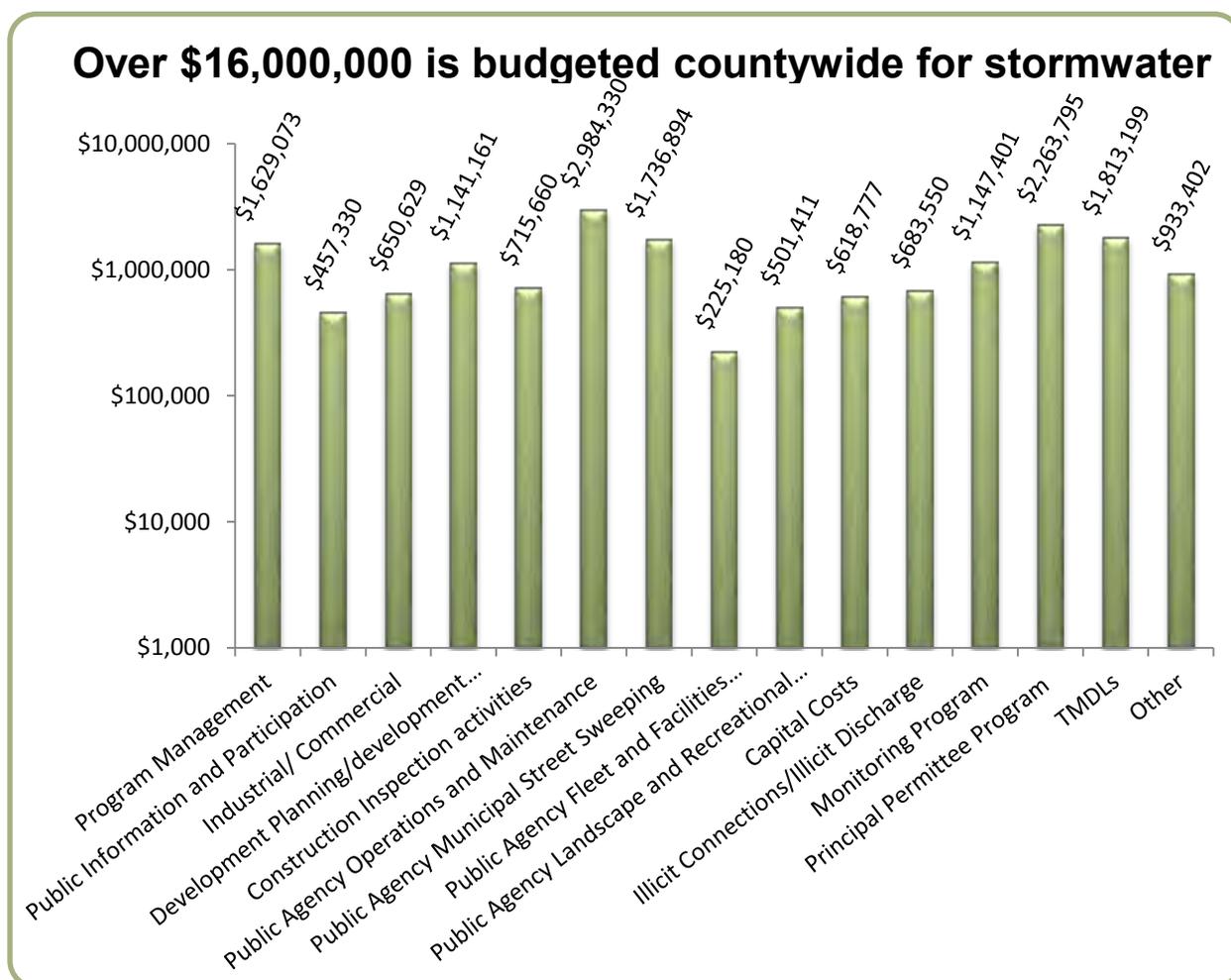
Each Permittee prepares a stormwater budget annually and allocates resources to be applied to the stormwater program. An effective stormwater program must be integrated within the entire management structure of a permittee, which means it transcends divisions and departments, therefore stormwater programs are not always uniquely identified in budgets, but more often integrated into the ongoing programs. Table 2-2 presents the projected stormwater budget for each Permittee for Fiscal Year 2012/13 and Figure 2-2 shows how the countywide budget is divided among the various programs. As expected, there is some variability between the stormwater program budgets reported

by the Permittees, even if normalized by population or geographic size. This variability is due in part to the accounting practices utilized by each Permittee and the allocation of activity costs amongst programs implemented by each Permittee. Variability is most significant when capital improvements are undertaken, these are usually very large and costly projects that may be TMDL driven or assisted by grant funding. These projects do not represent ongoing program costs, but rather investments in infrastructure to help reduce stormwater pollution into the future.

Table 2-2 Agency Annual Budget Update for Stormwater Management Program - Fiscal Year 2012-2013

Program Element	Camarillo	County of Ventura	Fillmore	Moorpark	Ojai	Oxnard	Port Hueneme	Ventura	Santa Paula	Simi Valley	Thousand Oaks	VCWPD	Principal Permittee
II. Program Management	\$ 280,928	\$ 348,820	\$ 10,000	\$ 54,224	\$ 12,000	\$ 132,095	\$ 25,000	\$ 225,000		\$ 198,881	\$ 120,000		\$ 222,125
III. Public Outreach	\$ 12,235	\$ 8,000	\$ 4,000	\$ 3,600	\$ 4,000	\$ 17,294	\$ 3,000	\$ 50,000	\$ 500	\$ 52,814	\$ 66,000	\$ -	\$ 235,887
IV. Industrial/Commercial	\$ 61,134	\$ 107,000	\$ 5,000	\$ 16,000	\$ 4,000	\$ 185,998	\$ 3,000	\$ 100,000		\$ 118,497	\$ 50,000	\$ -	\$ -
V. Planning and Land Development	\$ 48,077	\$ 165,000	\$ 5,000	\$ 75,000	\$ 5,000	\$ 91,404	\$ 3,000	\$ 375,000		\$ 28,218	\$ 60,000	\$ -	\$ 285,462
VI. Construction	\$ 76,922	\$ 94,000	\$ 8,000	\$ 75,000	\$ 5,000	\$ 180,894	\$ 3,000	\$ 50,000		\$ 182,844	\$ 40,000		\$ -
VII. Public Agency Activities													
Operations and Maintenance	\$ 198,309	\$ 68,400	\$ 10,000	\$ 17,000	\$ 12,000	\$ 467,809	\$ 24,000	\$ 194,038	\$ 20,000	\$ 334,774	\$ 138,000	\$ 1,500,000	\$ -
Municipal Street Sweeping	\$ 255,000	\$ 121,100	\$ 33,000	\$ 116,700	\$ 48,000	\$ 600,000	\$ 79,750	\$ 40,000	\$ 8,600	\$ 434,744			\$ -
Fleet and Public Agency Facilities (Corporate Yards)	\$ 5,665		\$ 7,000	\$ 16,300	\$ 5,500	\$ 33,581	\$ 3,000	\$ 7,000	\$ 29,500	\$ 12,634	\$ 105,000		\$ -
Landscape and Recreational Facilities	\$ 12,184		\$ 3,000		\$ 3,500	\$ 8,179	\$ 354,700	\$ 40,000		\$ 79,848			\$ -
Capital Costs	\$ -				\$ 12,000	\$ 390,000	\$ -	\$ 115,000	\$ 15,000	\$ 38,777	\$ 48,000		
VIII. Illicit Discharges/Connections	\$ 50,572	\$ 90,000	\$ 5,000	\$ -		\$ 85,058	\$ 3,000	\$ 30,000	\$ 2,000	\$ 352,954	\$ 46,000		\$ 18,966
Monitoring Program	\$ -			\$ -	\$ 2,000	\$ 29,144	\$ -	\$ -		\$ 6,081		\$ -	\$ 1,110,176
Principal Permittee Program	\$ 96,700	\$ 227,180	\$ 6,000	\$ 40,000	\$ 10,000	\$ 177,474	\$ 12,000	\$ 132,738	\$ 21,460	\$ 118,000	\$ 182,500	\$ 1,000,000	
TMDLs	\$ 113,871	\$ 1,041,000	\$ 4,000	\$ 34,000	\$ 12,500	\$ 74,028		\$ 65,800		\$ 43,000	\$ 425,000		
Other								\$ 10,000	\$ 475	\$ 141,748	\$ 180,000	\$ 210,000	\$ 391,179
Total	\$ 1,211,597	\$ 2,270,500	\$ 100,000	\$ 447,824	\$ 135,500	\$ 2,472,958	\$ 513,450	\$ 1,434,576	\$ 97,535	\$ 2,143,814	\$ 1,460,500	\$ 2,710,000	\$ 2,263,795

Figure 2-1 Countywide Budget FY 2012-13



The Permittees vary significantly in their jurisdictional area and population which can explain some differences in resources dedicated to various program areas. Another example of differences is that some Permittees have privatized streets sweeping and the annual costs are being born by the solid waste rate payers. Yet, a review of the annual budgets produces some nominal findings. As expected, total stormwater budgets trend upwards as population and service area increases. However, increased population doesn't always directly translate into increased revenue available for the program. Seeking new revenue sources to provide the needed resources to comply with the legal requirements of the Permit is an ongoing effort of the permittees.

2.4.2 Funding Sources

Funding sources to implement the stormwater program, including the programs that have been in place long before the permit requirements but are now relied upon to ensure permittees meet permit objectives, are both general and specific funds, taxes, maintenance and user fees, and grants. Other efforts in the county to monitor, cleanup, or otherwise improve stormwater quality by volunteer groups like Ventura Coastkeeper who's efforts can be considered to help implement some stormwater program elements are not included, however, permittee efforts to support volunteer groups in their endeavors are included.

The funding sources used by the Permittees include: Watershed Protection District Benefit Assessment Program, General Fund, Utility Tax, Separate Tax, Gas Tax, Special District Fund, and others (Developer Fees, Business Inspection Fees, Sanitation Fees, Fleet Maintenance, Community Services District, Water Fund, Grants and Used Oil Recycling Grants).

All Permittees except the City of Moorpark gave authorization to use the Watershed Protection District’s Benefit Assessment to finance the activities and requirements. This was done through watershed based Implementation Agreements for the Ventura Countywide Stormwater Quality Management Program. The Implementation Agreements identified the responsibilities of the parties to the Permit and set forth the methodology for using the District’s Benefit Assessment financing to fund the NPDES Stormwater Program in their respective jurisdictions.

The Agreements have been amended over the years and with the new permit a new effort to secure a long term agreement was initiated. The result was a five year Implementation Agreement with all Permittees to replace the original agreement. The Agreement defines the fiscal responsibilities (expenditures and contributions) of all collective parties with respect to the current Permit. It formalizes the Permittees’ commitment to cooperate and to mutually fund an integrated Program of protecting and improving water quality in Ventura County. The five year time frame was designed to mirror the term of the permit. As new permits are written and adopted for Ventura County these agreements will be reviewed, revised, and renewed as appropriate.

Table 2-3 Permittee Population and Area

Ventura County Statistics		
Co-permittee	Population	Area (Sq. Mi.)
Camarillo	65,201	20.0
County of Ventura	92,063	24
Fillmore	15,000	3.2
Moorpark	34,421	12
Ojai	8,156	4.4
Oxnard	200,004	26.9
Port Hueneme	21,887	4.5
Ventura	109,000	32.7
Santa Paula	30,000	4.6
Simi Valley	126,414	42.0
Thousand Oaks	128,000	55.0

3 Public Information and Public Participation

3.1 OVERVIEW

The purpose of the Public Outreach Program Element is to increase knowledge and change behavior of the public to reduce stormwater pollution. By informing the public regarding the impacts of urban stormwater runoff and introducing steps they can take to reduce pollutants from everyday activities runoff quality should improve in both wet and dry weather. In addition to improving water quality, helping the public understand the problems associated with urban stormwater runoff can help build support for the stormwater program.

The Public Outreach Program Element is designed to implement and evaluate a comprehensive short- and long-term public education campaign that will inform the community about how our actions may adversely impact urban stormwater discharges and, subsequently, the local water bodies.

Public education is an essential part of a municipal stormwater program because changing public behavior can create a real reduction in pollutants. When a community has a clear understanding of where the pollution comes from, how it can affect them, and what they can do to stop it, they will be more likely to support the program, change their own practices, and help educate others.

The Permittees are building upon the many successes of the current program. Early in the program, the Permittees identified key elements crucial to establishing a successful outreach campaign. These elements include:

- Watershed Awareness;
- Identification of general and specific goals of the program;
- Identification of target audiences and key messages for those audiences;
- Development of program strategies and plan overview;
- Consistent messaging using a unified “brand name”;
- Development of a watershed based outreach program;
- Development of a model public education/public participation strategy for localization at the Permittee level;
- Development and implementation of a school-aged children education outreach program;
- Development and implementation of food facilities outreach program materials;
- Development and implementation of automotive facilities outreach program materials;
- Development and implementation of industrial facilities outreach program materials; and
- Public Awareness Surveys to measure success and determine needs;

3.2 CONTROL MEASURES

The Permittees have developed several Control Measures and accompanying performance standards to ensure that the Public Outreach Program requirements found in the Permit are met and provide information for optimizing the Program.

The Public Outreach Program Control Measures are organized to be parallel to the organization of the Permit and consist of the following:

Table 3-1 Control Measures for the Public Outreach Program Element

PO	Control Measure
PO1	Public Reporting
PO2	Public Outreach Implementation
PO3	Youth Outreach and Education
PO4	Business Outreach
PO5	Effectiveness Assessment

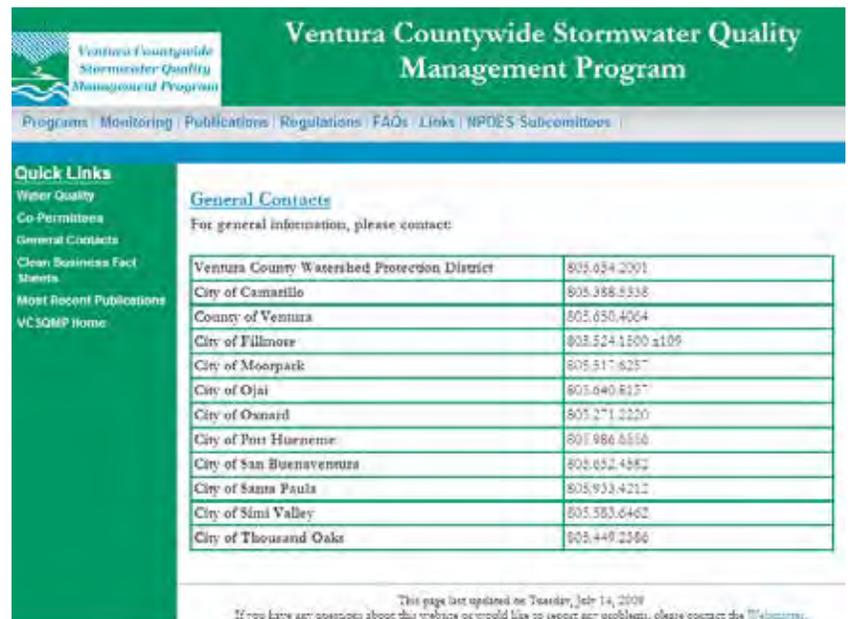
At the end of this chapter these control measures are evaluated to determine the effectiveness of this program element.

3.3 PUBLIC REPORTING - PO1

The purpose of this Control Measure is to identify staff to serve as contact persons and to operate and advertise public hotline numbers to facilitate public reporting of observed water pollution problems. This Control Measure also ensures that through the hotlines, complaint information is forwarded to the appropriate contacts for follow-up and/or investigation.

3.3.1 Identify Staff to Serve as Contact Persons for Public Reporting

Permittees have identified staff to serve as the contact person for public reporting, in many cases more than one staff member will serve in this capacity to ensure that someone is always available to respond. Designated staff members are provided with relevant stormwater quality information, including program activities and preventative stormwater pollution control information.



Screen shot of Program website

Performance Standard 3-1

Identify staff who will serve as the contact person(s) for public reporting of water pollution problems			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

3.3.2 Maintain Public Reporting Hotline Numbers

The Permittees have two types of phone numbers for the public: one for general stormwater information and one for reporting water pollution problems. The latter number is used by the public to report illicit discharges or illegal dumping into the storm drain system, faded or missing catch basin markers, and other observed water pollution problems. In some cases this number is also used to report clogged catch basin inlets, but

there may be another number for that as well. Staff is also available to provide general stormwater information.

Once a water pollution complaint is received, staff initiates a response within 24 hours to the reported illicit discharges, and within 21 days to illicit connections. For additional summary information regarding use of the hotlines for reporting illicit discharges or illegal connections see the process outlined in Section 8 Illicit Connections and Illicit Discharges Elimination. During the Permit term, the Permittees will consider a web-based reporting form for reporting illegal discharges and illicit connections (see Control Measure ID1), however the timely response needed to stop illicit discharges necessitate the public report to a live person as quickly as possible, so it is considered more appropriate for a website to refer to a phone number.

Performance Standard 3-2

Public reporting information has been listed in the government white pages of the local phone book			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

3.3.3 Promote/Publicize Public Reporting Hotline Numbers/Contact Information

Contact information for reporting water pollution complaints for all Permittees is updated as necessary and published in the government pages of the local phone book and other appropriate locations. In addition, this contact information is available at several Permittee web sites.

Table 3-2 Web Sites Listing Contact Information for Public Reporting

Program or Permittee	Web site URL
Ventura Countywide Stormwater Quality Management Program	http://www.vcstormwater.org/contacts.html
Community for a Clean Watershed	http://cleanwatershed.org/MAIN%20PAGES/Contacts.htm
Ventura County Watershed Protection District and County of Ventura	http://www.vcstormwater.org/index.php/programs/illicit-dischargedumping
City of Camarillo	www.ci.camarillo.ca.us
City of Fillmore	www.fillmoreca.gov
City of Moorpark	www.ci.moorpark.ca.us
City of Ojai	www.ci.ojai.ca.us
City of Oxnard	www.Publicworks.cityofoxnard.org
City of Port Hueneme	www.ci.port-hueneme.ca.us
City of Ventura	www.cityofventura.net
City of Santa Paula	http://www.vcstormwater.org/contacts.html
City of Simi Valley	www.simivalley.org/environmentalcompliance
City of Thousand Oaks	http://www.toaks.org/faqs/categoryqna.asp?id=7#275
County of Ventura	http://portal.countyofventura.org/portal/page/portal/PUBLIC_WORKS/Watershed_Protection_District/About_Us/VCWPD_Divisions/Water_and_Environmental_Resources/Water_Quality

Performance Standard 3-3

Promote and publicize contact information for public reporting in public information media, such as the government pages of the telephone book and web sites	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

3.4 Public Outreach Implementation - PO2

The Public Outreach Implementation Control Measure provides that outreach be conducted with the residential community and general public to inform these audiences of the impacts of urban stormwater runoff and introduce steps they can take to reduce pollutants in stormwater runoff. Such outreach communicates to the Permittees’ residents and visitors the importance of stormwater quality protection and pollution prevention as it relates to the protection of the local water bodies.

3.3.4 Work with Existing Local Watershed Groups

There are four watersheds in urbanized Ventura County: Malibu Creek, Calleguas Creek, Santa Clara River, and the Ventura River. Each of these watersheds has a watershed organization developed to get stakeholders to work together to identify problems and reach consensus on solutions. The Program's members are involved with these groups and are accomplishing this Permit requirement through their collective effort.



Performance Standard 3-4

Work with existing local watershed groups or organize watershed Citizen Advisory Groups/Committees to develop effective methods to educate the public about stormwater pollution? (by July 8, 2011)			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>		

3.3.5 Educate Ethnic Communities

The Permit requires the Principal Permittee to develop and implement a strategy to educate ethnic communities through culturally effective methods. The Program has previously performed focus groups on Ventura County residents who speak Spanish at home. The information gained through this effort helped the Program understand what needs to be communicated to Spanish speakers and where that communication will be most effective.

To reach the significant Hispanic community in Ventura County, many elements of each campaign throughout the year were created in Spanish. This includes transit shelter and radio ads. Using a multi media mix of newspaper, radio, and transit shelters, Spanish language advertising accounted for 15% of the annual media impressions: 1,094,112. (This figure does not include the BMP fact sheets and other handouts.)



Spanish language litter and pesticide bus shelter posters

Performance Standard 3-5

Develop and implement a strategy to educate ethnic communities through culturally effective methods?			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>		

Performance Standard 3-6

Conduct stormwater pollution prevention public service announcements			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>		

3.3.6 Make Five (5) Million Stormwater Quality Impressions per Year

During the Permit year the Program conducted a comprehensive stormwater pollution prevention advertising campaign. Media plans were negotiated with the goal to maximize target reach and frequency on a limited and fractionized budget. This was particularly true this year when the budget needed to stretch to cover several audiences. To amplify total market penetration, the adult and youth campaigns were scheduled either concurrently (fall) or in quick succession (spring), to take advantage of any overlap in the audiences. Attention was paid to geographical distribution throughout Ventura County as well as adequate coverage in the Latino market. The Program contracted with a full service marketing firm located in Ventura County, theAgency, who was able to consistently obtain low rates and significant bonus elements, including bonus radio commercials and outdoor billboards.

The media chosen for the Community for a Clean Watershed program are objectives-based, balancing the goals of reaching the diverse target audiences within the region at an adequate level of repetition within a limited budget. Tactically, adult and youth efforts are scheduled to overlap in order to amplify the total share of voice within the market. As in past years, attention was paid to geographical distribution throughout Ventura County as well as adequate coverage in the Latino market.

In addition to the more traditional media of cable television, radio, and outdoor transit shelters, cinema ads and posters in local malls were utilized in this year’s plan. Due to its proliferation and ability to reach youth in particular, the social medium Facebook was also added to the Watershed’s Fiscal Year 2011 outreach efforts, both as a Page and utilizing Facebook ads targeted within Ventura County. theAgency was able to consistently obtain low rates and significant bonus elements, including bonus radio commercials and outdoor billboards.

For the three campaigns in the 2010 /11 year, the Community for a Clean Watershed marketing effort plan achieved a total of 6,592,955 gross impressions, as follows:

Table 3-3 Community for a Clean Watershed Gross Impressions

<u>Timing</u>	<u>Campaign</u>	<u>Gross Impressions</u> <u>(Persons 6+)</u>	<u>Youth Impressions</u> <u>(included in total)</u>	<u>Spanish Impressions</u> <u>(included in total)</u>
Fall 2011	Coastal Cleanup	1,623,982		70,000
Fall 2011	Trash Education	3,670,059	989,849	502,712
Spring 2012	Green Waste	<u>1,693,395</u>	--	<u>521,400</u>
Total Media Plan		6,987,436	989,849	1,094,112
Website		5,826		
Press Releases/Bylines (7)	Various	<u>392,000</u>		
Total Impressions		7,385,262		

Media Outreach Strategy

The media chosen for the Community for a Clean Watershed program are objectives-based, balancing the goals of reaching the diverse target audiences within the region at an adequate level of repetition within a limited budget. Tactically, adult and youth efforts are scheduled to overlap in order to amplify the total share of voice within the market. As in past years, attention was paid to geographical distribution throughout Ventura County as well as adequate coverage in the Latino market.

In addition to the more traditional media of cable television, radio, and outdoor transit shelters, Facebook continued to be an important element in the Watershed’s Fiscal Year 2012 outreach efforts, both as a Page and utilizing Facebook ads targeted within Ventura County. theAgency was able to consistently obtain low rates and significant bonus elements, including bonus radio commercials and outdoor billboards.

For the three campaigns in the 2011/12 year, the Community for a Clean Watershed marketing effort plan achieved a total of 7,385,262 gross impressions, as follows:

Collaboratively, the Permittees continued to execute a variety of outreach activities. The 2011/12 year’s efforts included the following key initiatives, which were created and implemented through theAgency.

Of particular note was the effort targeted to students in Kindergarten through 12th grade. This component, which was directed in part by the information revealed in last year’s web survey findings, effectively reaches this important target audience. Through cost-efficient use of local media, this audience will have

the opportunity to see/hear the Watershed message multiple times, thus having the potential to create long-term awareness and impact.

Performance Standard 3-7

Make a minimum of 5 million impressions per year to the general public related to stormwater quality, with a minimum of 2.5 million impressions via newspaper, local TV access, local radio and/ or internet access.			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fall 2011: “A Day in the Life” Trash

The Fall focus was on trash, building on the YouTube-like commercial created last year, “**We Can Do This,**” which promoted activism, demonstrated the harmful effect of trash in our yards/neighborhoods and encouraged participation by picking up trash in order to protect the watershed. Our ‘hero’ from “We Can Do This” reprises his role in “A Day in the Life,” where he describes a ‘typical’ day in the life of Ventura County’s Watersheds. As he reads from a list of items collected during a recent local Coastal Cleanup Day, the ‘junk’ literally falls out of the sky onto his head. He continues to read and the trash builds up around him until he gets to the figure for the estimated pounds of dog poop when his expression becomes very concerned (knowing what will drop next) and the spot ends.



Frames from “A Day in the Life” TV Spot



A Day in the Life Transit Shelter



Online Web Ad

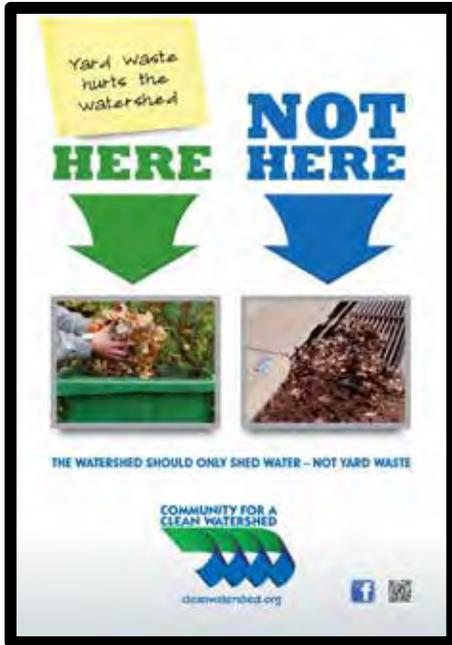
Spring 2012 – “Shouldn’t Have” Green Waste

In Spring, the pollutant of concern was Green/Yard waste, utilizing the Green Waste television spot which brought back the animated couple from our pesticide commercial. This time, our couple has an overgrown yard which after being trimmed back, is washed into the storm drain and eventually to the beach. In an entertaining way, “Shouldn’t have done that” demonstrates that green waste is toxic when rain and sprinklers carry it into the Watershed.



Frames from “Shouldn’t have done that” TV Spot

In the weeks leading up to Earth Day, corresponding radio spots in English and Spanish supported the television message, along with these Green Waste transit shelters:



Green Waste Transit Shelters

Permittee Efforts

On top of what the Program provides for public outreach countywide, the individual Permittees implement their own outreach efforts focusing on local issues and more personal interactions with their residents. Countywide these efforts beyond the Program’s efforts lead by the Principal Permittee made over an additional 6.1 million impressions. Below are some examples of these efforts:



Earthday events countywide help educate residents about pollution

Camarillo

1. Published the following articles in the City of Camarillo City Scene Newsletter:
 - a. July/August 2011: "Save the Date- 2011 Coastal Cleanup Day" (25,100 Contacts)
 - b. September/October 2011: "Ready For Rain? Slopes and Drains Must Be Maintained!" (25,100 Contacts)
 - c. November/December 2011: "Thank You, 2011 Coastal Cleanup Day Volunteers!" (28,000 Contacts)
 - d. January/February 2012: "Do the Right Thing for the Environment" (28,000 Contacts)
 - e. March/April 2012: "Think Before you Drain!" (28,000 Contacts)
 - f. May/June 2012: "Do You Know Where Your Litter Goes?" (28,000 Contacts)
2. Mail out to swimming pool owners with letter and flyer (68 Contacts)
3. Send postcards to 2010 Coastal Cleanup Day volunteers to notify them of 2011's event (137 Contacts)
4. Utility bill insert sent to city customers regarding 2011 Coastal Cleanup Day and advertised cleanwatershed.org website (20,000 Contacts)
5. City Scene TV played "We Can Do It" video and Coastal Cleanup Day Ad from 8/1/2011 through 9/17/2011 (20,000 Contacts)
6. Enviroscape Demonstration at Girl Scouts event at Cal. State Channel Islands (88 Contacts)
7. Email with information regarding Coastal Cleanup Day sent to potential volunteers (31 Contacts)
8. Mail out to Construction Contractors (123 Contacts)
9. Coastal Cleanup Day Proclamation at televised City Council mtg.- PowerPoint and Video Presentation (100 Contacts)
10. Mail out to owners of stormwater post-construction treatment devices requesting maintenance records (146 Contacts, 80 Devices)
11. Mail out (2nd Notice) to owners of stormwater post-construction treatment devices requesting maintenance records (26 Contacts, 17 Devices)
12. Mail out (3rd Notice) to owners of stormwater post-construction treatment devices requesting maintenance records (10 Contacts, 8 Devices)
13. Earth Day 2012 at Camarillo Community Center (180 Contacts)
14. Trash and Debris Removal Assistance Letter sent to shopping center owners (42 Contacts)
15. Two "Calleguas Creek Watershed - Keep it Clean" signs were posted at Calleguas Creek in Camarillo

County of Ventura

1. 20,300 inserts were mailed out with the Integrated Waste Management Division December, 2011 monthly trash bill for unincorporated residents served by IWMD for trash collection, providing information for proper disposal of household hazardous wastes, electronic waste, and medication disposal. 100 horse manure BMPs were handed out during a Household Hazardous Waste Event in the Santa Rosa Valley area (which has a large percentage of residences with horses.)
2. 176 fliers were delivered to Oak Park residents related to illicit discharge prevention and 90 fliers on stormwater BMPs for pool cleaning were provided to residents that aerial imagery indicated a pool in the backyard. The area was targeted for compliance with the Malibu Creek Bacteria TMDL.
3. The following schools serving County of Ventura unincorporated area were visited during the 2011 fall KCAQ school tour, which included educational outreach to middle and high school students with a message about preventing littering and trash impacts to local waterways:
 - a. September 14 - Rio Mesa High, Oxnard: 950 students attended (covers County unincorporated RSBW Trash TMDL tributary areas)
 - b. September 28 - Rio Vista Middle, Oxnard: 650 students attended (covers County unincorporated RSBW Trash TMDL tributary areas)
 - c. October 24 - Newbury Park High, Newbury Park: 1,200 students attended
 - d. October 31 - Nordhoff High: 700 students attended (covers upper Ventura River County unincorporated communities of Meiners Oaks and Mira Monte)

- e. November 7 – Adolfo Camarillo High: 1,200 students attended (covers County unincorporated RSBW Trash TMDL tributary areas)
- f. November 18 – Rio de Valle Middle School, El Rio: 600 students attended (serves El Rio)

Moorpark

1. The City of Moorpark participates in Coastal Cleanup Day. The event was on September 17, 2011 during FY 2011/12. Thirty-seven volunteers covered approximately six miles of the Arroyo Simi, collecting 300 pounds of trash. Many volunteers who had participated in previous years noted that there appeared to be less trash around than in the past.
2. Public information on stormwater protection is also provided during Moorpark Country Days. Country Days was held on October 1 during FY 2011/12. An estimated 4,000 people attended the event.
3. The City offers free hazardous waste collection events to residents of Moorpark. In FY 2011/12, 290 households used the service.
4. Mass mailing includes the City's quarterly newsletter that went to approximately 13,200 households.
5. In FY 11/12, the City did NPDES messages in two quarters. NPDES messages were also mailed in four solid waste bill inserts to 8,008 households each time.

Ojai

1. Eagle Scout project posting "don't dump" signs on accessible water courses.
2. Ojai Day - October 2011 - booth literature distribution.
3. Contact local school officials to distribute brochures.

Oxnard

1. The City of Oxnard has established the OxnardNews.org website to publicize community events such as Earth Day and Coastal Cleanup day. Community members can access the website to view calendars of upcoming events, view press releases, or even watch videos of past events. Coastal Cleanup Day is an event that consistently receives huge community support. City of Oxnard Outreach Specialists will post a press release containing information about the event at least one month in advance to assist community volunteers with pre-registration and planning. This past September, members of the Oxnard community participated in Coastal Cleanup Day at the Ormond Beach Wetlands and Oxnard Beach Park. The City of Oxnard Education and Outreach Specialists estimate that about 3,600 contacts were made at America Recycles Day, Earth Day, and the Compost Workshop. In addition, the City of Oxnard added an additional web page entitled "Oxnard's Green Sustainability Programs". This page provides info on various programs designed to develop and nurture a balanced connection between natural resource conservation, economic vitality, and quality of life.

Port Hueneme

1. The City has a few citizens that perform trash clean-ups along our green belt and also has a group that performs beach cleanups separate from the Coastal Cleanup activities. The City is also preparing to administer training with Neighborhood Watch Groups in the near future. The City also had a booth at the annual Hueneme Beach Festival that included stormwater educational materials and water conservation practices.

Simi Valley

1. Throughout the year the City of Simi Valley participated in several community events to help promote pollution prevention and improve stormwater awareness within the community. During the reporting period six Household Hazardous Waste events were held where 53,818 pounds of

hazardous waste was collected from the residents of Simi Valley. Stormwater informational brochures were handed out to each of the 802 participants at the events.

2. An Electronic Waste Collection event was held on April 21, 2012. Informational BMP brochures designed for residents were also handed out at these events.
3. The City took part in the Earth Day event held on April 21, 2012 at the Simi Valley Town Center and the City Street Fair held in May. Stormwater demonstrations were given using an Enviroscape to approximately 250 adults and children at Earth Day and the Moorpark College Environmental and Multicultural Day. The City had a staffed booth and informational brochures were handed out at the Street Fair.
4. The City's Environmental Compliance Inspectors took the time to educate residents and businesses during 137 compliance responses.
5. The City took part in the annual Coastal Cleanup Day on September 17, 2012, 230 volunteers collected approximately 1,700 pounds of trash from a three mile stretch of the Arroyo Simi.
6. City staff issued 141 Pool Discharge Encroachment permits, handing out our Swimming Pool Maintenance BMP brochures with each encroachment permit. The Swimming Pool Maintenance brochures was also given out with Building and Safety permits for new pools.



Both Girl and Boy Scouts have been used by several Permittees for cleanup and other outreach events.

Thousand Oaks

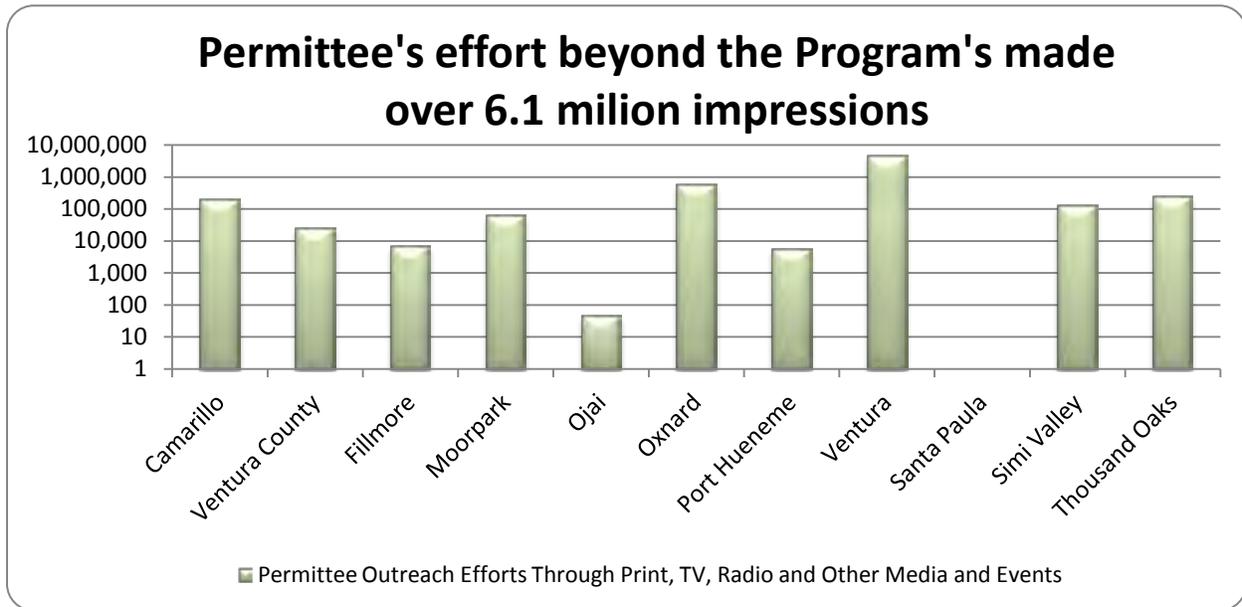
1. Community Cleanup Day—The City of Thousand Oaks sponsored a collection event of waste materials on June 2, 2012. At the event, about 1,238 residents brought 188.67 tons of trash, 42.59 tons of green waste and 4.29 tons pounds of e-waste for free disposal.
2. Coastal Cleanup Day—On September 17, 2011, 268 volunteers worked together to clean about 3.1 miles of channel and creek in and around Borchard Park; a channel in Thousand Oaks Community Park; and an area of the Arroyo Conejo Creek in Thousand Oaks. The volunteers were from the general public, a Girl Scout group, and a group recruited from the Amgen Company. This combined effort removed 1467 pounds of litter and debris and about 108 pounds of recyclable materials from creek areas.
3. Freeway Ramp and Interchange Collection Program (also called Adopt-A-Highway)—From July 1, 2011 to June 30, 2012, about 14,500 pounds of trash and debris were removed from 13 freeway on-ramps and exits and one freeway interchange in the City of Thousand Oaks.
4. City of Thousand Oaks Household Hazardous Collection Program—Eleven collection events were held once a month during the 2011/12 fiscal year. Over the year, 4,851 residents brought in 513,144 pounds of household chemicals waste materials including fertilizers, cleaning chemicals, paints, insecticides, electronics, used motor oil, and unused pharmaceuticals. Material re-use conducted under this program recycled 15,725 pounds of material for beneficial uses instead of disposal.
5. The City of Thousand Oaks sponsored Arbor Earth Day on April 28, 2012. Representatives from the City's Resource Division provided information to attendees about watershed and solid waste issues and how to improve them. Informational brochures on these topics were available to all. More than 3,000 people attended this event.
6. An outreach event was held at Thousand Oaks Hyatt Hotel on April 20, 2012. Informational displays and a question and answer format educated participants about stormwater and solid waste topics. About 25 people attended.
7. Utility Bill Inserts—Promotional/informational inserts were prepared and distributed for Community Cleanup Day and Arbor Earth Day with a run of 33,000.
8. Thousand Oaks stormwater personnel made presentations centering on water quality issues caused by urban runoff at the following public schools: Thousand Oaks High School (2/25/12) and Westlake High School (4/4/12). These half-hour presentations were viewed by about 160 students and they included a message about how to protect a watershed.
9. Public Works Week—May 23rd and 24th 2011—About 17 Conejo Valley schools brought more than 588 3rd grade students and about 169 adults to see examples of the activities and equipment that are used to by the City of Thousand Oaks to maintain its infrastructure. To inform participants about protecting stormwater quality, a table-sized watershed model was marked with colored pens to represent commonly used yard chemicals. Children participated by making simulated rain with spray bottles to see these suggestive pollutants contaminate the creeks and lake as runoff.
10. Neighborhood Cleanup Program—Fiscal Year 2011/12—The City sponsors free placement of general refuse and green waste 40-yard dumpsters, when neighborhoods follow a procedure to generate enough interest and participation. There were 43 such events where two dumpsters were taken out to

neighborhood locations. In total, 141.7 tons of trash waste and 40.97 tons of green waste were received and taken to proper disposal.

Ventura

1. The mission of the City of Ventura's volunteer based programs is to showcase and preserve Ventura's natural resources and beauty. The programs include the following: Seven Community Park clean ups with 147 volunteers working to remove litter from public areas; Two Earthday sites with 595 volunteers; Community cleanups on the Westside and Eastside with 40 volunteers; Ventura River bottom annual clean up with 602 students from Cal Lutheran; Ventura Yacht Club beach and water clean ups with 42 volunteers; Seaward Beach cleanup with 75 volunteers; Trashathon, held at ten sites with 267 volunteers; and five Coastal Clean Up with designated sites with 792 volunteers. These events serve to further educate the residents in good stewardship and stormwater pollution prevention.
2. In addition, the City of Ventura staff participated in other community outreach events and offered stormwater education as a component of its message. Some of these included the following: Farmer's Markets, Home and Garden Show, Eco-Fest, Summerfest, Hillside Music Festival, Botanical Garden, Festival in the Park, and the 4th of July street fair. The City also hosted three workshops on Ocean Friendly Gardens that serve to educate residents on the proper application of water, fertilizer, pesticides, and herbicides to help eliminate runoff into our watersheds. City staff provided outreach and education to 5400 students in the Ventura Unified School District classrooms including a section on stormwater and the effect of runoff on our watersheds.

Figure 3-1 Impressions made through Permittee efforts



3.3.7 Storm Drain Inlet Markers and Signage Discouraging Illegal Dumping

The Permit requires each Permittee to label all storm drain inlets that they own with a legible “no dumping” message and to maintain them. The Permit also requires signs with prohibitive language (i.e., discouraging illegal dumping) to be posted and maintained at designated public access points to creeks, other relevant waterbodies, and channels.

Performance Standard 3-8

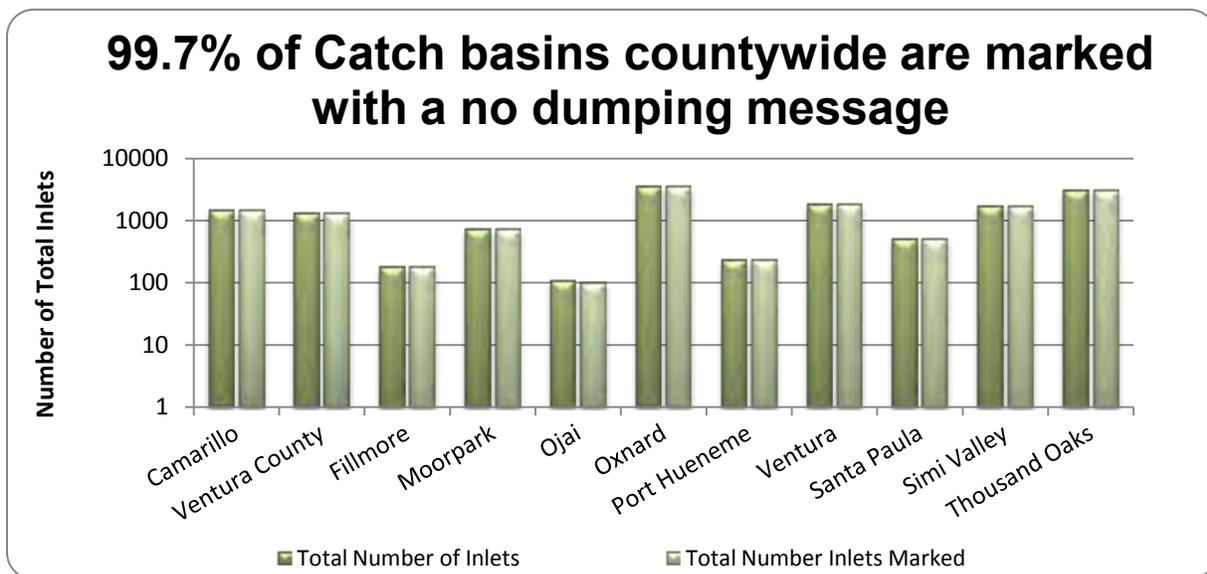
Label storm drain inlets with a “no dumping” or equivalent message			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

Label Storm Drain Inlets with “No Dumping” Message

As of 2011/12, the Permittees had completed labeling or marking the curb inlets to their entire storm drain system. Permittees maintain their inlet signs by reapplying stencils/markers as they wear out (see Control Measure PA5) and applying stencils/markers to new inlets as they are installed. Markers at curb inlets have varying useful lives due to the materials from which they are constructed (e.g., paint, thermoplastic), their position (e.g., on top of curb, on face of curb), and wear factors (e.g.,

traffic, street sweeping, sunlight). As a result, the Permittees have different programs to maintain curb inlet markers within their respective jurisdictions. Some Permittees replace a portion of their markers each year, whereas others re-mark all inlets every few years. Regardless of the specific inlet marker practice, all Permittees understand the importance of storm drain inlet markers to the education component of their program and are committed to installation and maintenance of the markers.

Figure 3-2 Catch Basin Labeling

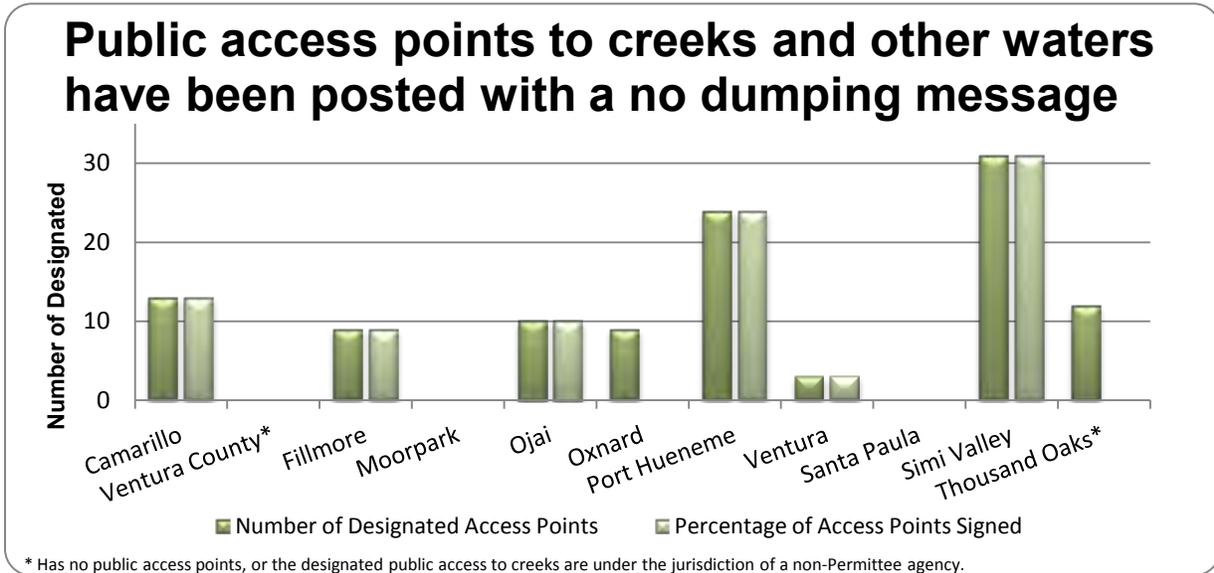


Post Signs with Language Discouraging Illegal Dumping

The Permittees are required to designate appropriate access points to the creeks and channels within their jurisdiction for the placement of signs with prohibitive language to discourage illegal dumping. Each

Permittee is responsible for designating the appropriate access points to creeks and channels within their jurisdiction, which requires field verification and mapping. In some cases a Permittee may not have any designated public access points or they are under the jurisdiction of a special district outside a Permittee’s jurisdiction.

Figure 3-3 Public Access Point Signage



3.3.8 Educational Materials

The Permittees are required to distribute stormwater pollution prevention educational materials covering specific types of pollutants to specific businesses. The businesses to be targeted with these pollutant-specific educational materials include automotive parts stores; home improvement centers, lumber yards, and hardware stores; and pet shops and feed stores. In addition, the Permit requires the Permittees to continue the existing outreach program to residents on the proper disposal of litter, green waste, pet waste, proper vehicle maintenance, lawn care, and water conservation practices.



Public access sign



Retail Partnership Brochures: Gardeners, Pet Owners, Car Owners (Due July 8, 2011)

Three Watershed Protection Tip pamphlets aimed at residents were created to encourage best practices in their homes. These brochures were distributed to targeted retailers called out in the permit to reach the population that is likely involved in the activities. Each colorful pamphlet defines the Watershed, explains the storm drain system, how polluted water is damaging and gives both overall and topic-specific tips for how to keep the Watershed clean. For example:

- Gardeners: discuss plant selection, irrigation, fertilizer and pesticide practices, integrated pest management and yard maintenance
- Pet Owners: safe methods for handling and disposing pet waste, for both cats and dogs
- Car Owners: do-it-yourself clean vehicle care practices for fluids, tires, batteries and car-washing



Retail Partnership Brochures

Figure 3-4 Summary of Retail Partnership – Auto Parts Store

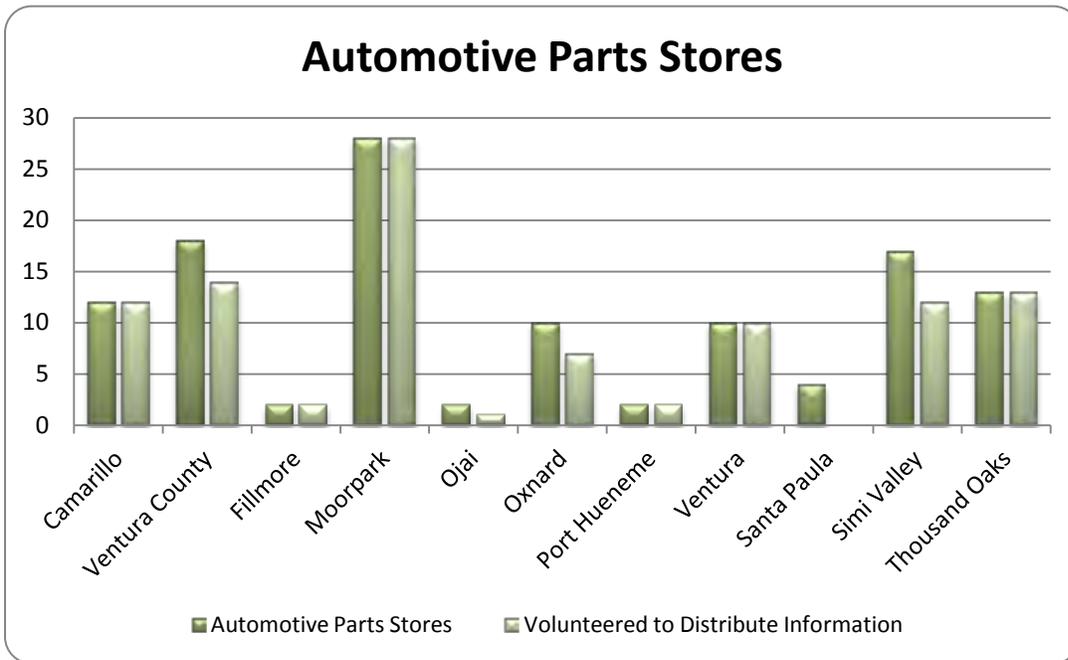


Figure 3-5 Summary of Retail Partnership – Home Improvement and Nurseries

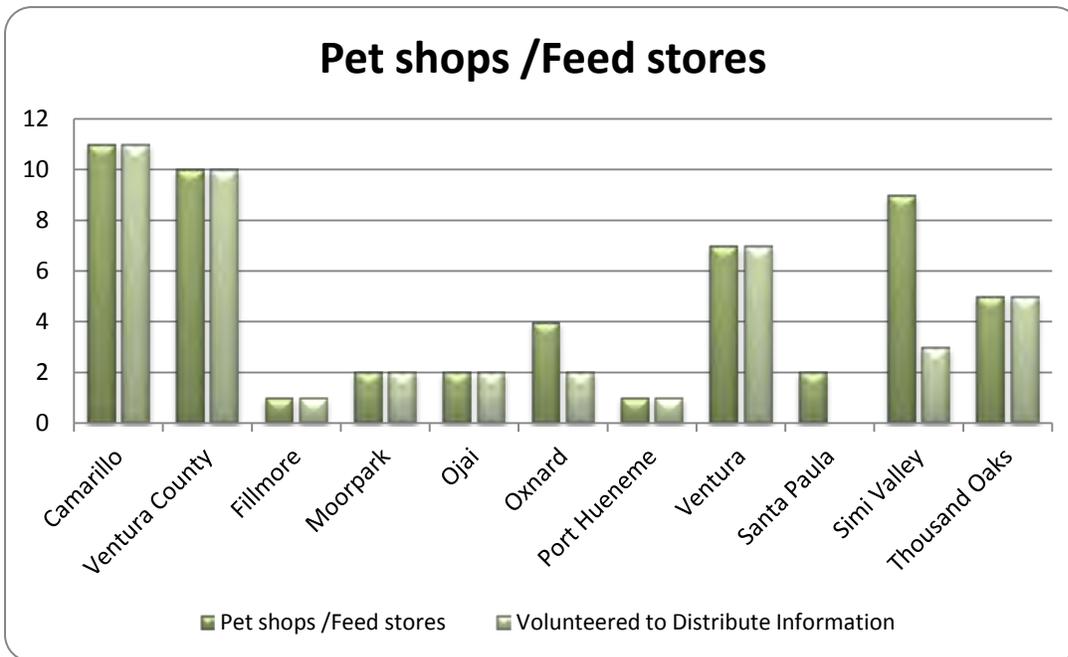
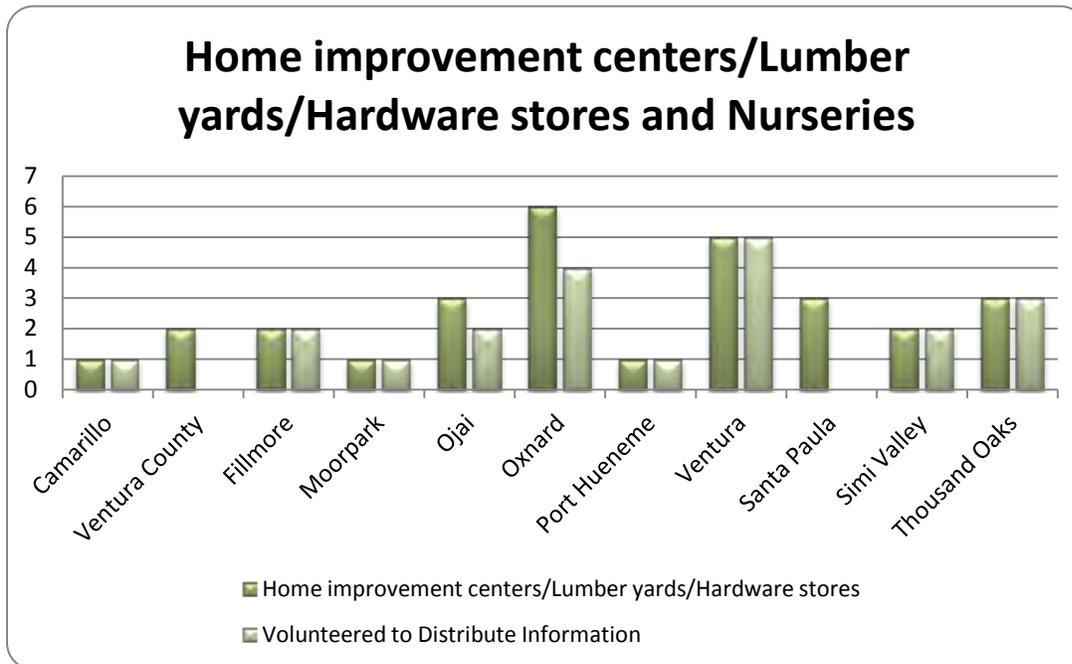


Figure 3-6 Summary of Retail Partnership –Pet Shops



3.3.9 Maintain and Update the Countywide Stormwater Website

The Permit requires the Permittees to maintain the Countywide stormwater website (www.vcstormwater.org). This is the website specified by the Permit, but the Permittees also use cleanwatershed.org primarily for outreach, as described earlier under “activity-specific outreach to residents”. The Community for a Clean Watershed Web site (cleanwatershed.org) is the primary mechanism used by the Permittees to reinforce the various public outreach messages as well as make available a network of resources to help the web viewer make informed decisions. The website is updated on a regular basis to add relevant campaign materials as well as educational materials.

In addition, the website is required to include pollutant-specific educational material addressing (at a minimum) information on the proper disposal, storage, and use of the following:

- Vehicle waste fluids
- Household waste materials
- Construction waste materials
- Pesticides and fertilizers (including IPM)
- Green waste (including lawn clippings and leaves)
- Animal wastes



Community for a Clean Watershed Website

Community for a Clean Watershed Website

The cleanwatershed.org website continues to reinforce the various public outreach messages as well as make available a network of resources to help the web viewer make informed decisions. The website is updated regularly to add relevant campaign materials as well as educational materials. Unique visitors to the website were up 15% over last year with 2,895 people coming to the site over 4,100 visits and viewing an average of 1.9 pages.

Performance Standard 3-9

Maintain the stormwater Web site (www.vcstormwater.org)			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The Countywide Stormwater Web Site (www.vcstormwater.org) is periodically updated to include pollutant-specific educational materials for businesses and do-it-yourself homeowners. Facts sheets have been developed over the life of the program and include educational materials on the proper disposal, storage, and use of the following pollutants:

- Vehicle waste fluids
- Household waste materials
- Construction waste materials
- Pesticides and fertilizers (including IPM)
- Green waste (including lawn clippings and leaves)
- Animal wastes

3.3.10 Community Events

The Permit requires the Permittees to individually and collectively organize community-oriented educational activities and events and to participate in countywide events focusing on stormwater quality. The main countywide event for the stormwater program is Coastal Cleanup Day.

The 26th annual California Coastal Cleanup Day was held this year on September 17, 2011. Nearly 72,000 volunteers turned out across California to help pick up trash and prevent it from spreading in our coastal and inland waterways. Statewide, the volunteers picked up more than 1.3 million pounds of trash and recyclables. Internationally, when combined with The Ocean Conservancy's International Coastal Cleanup Day which is held on the same day, the event becomes one of the largest volunteer events of the year. Families, students, service groups and neighbors all work together to show their support for our shared natural resources while helping reduce and prevent the impacts of marine debris.

The Ventura County Coalition for Coastal and Inland Waterways (VCCIW) coordinates the event in Ventura County. Representatives of the stormwater Permittees serve on the VCCCIW and have been actively involved in organizing Ventura County’s Coastal Cleanup Day efforts since 1996. The VCCCIW conducts advertising campaigns, finds sponsors, coordinates materials receipt and pickup, and works with site captains to organize site access permission and trash hauling. The California Coastal Commission oversees the California Coastal Cleanup Day and provides some advertising materials and assistance as needed.

Coastal Cleanup Day had 3,165 volunteers covering a distance of 36 miles at 22 sites countywide and collected 12,810 pounds of trash, and 1,880 pounds of recyclables.

At Ventura County’s 2011 Coastal Cleanup Day, 3,165 volunteers at 22 sites countywide collected 12,810 pounds of trash and 1,880 pounds of recyclables, and covered a distance of 36 miles. Not only does the event remove a significant amount of trash, but each item that is picked up is tallied by category, providing a wealth of information about the types of items that are being found. This information is useful for shaping future public outreach campaigns.

This year, the “bring your own bucket, bottle, and gloves (BYOBGG)” pre-campaign continued. The BYOBGG campaign aims to make Coastal Cleanup Day a zero waste event by having participants bring their own reusable waste buckets, gloves, and water bottles, thereby reducing the volume of trash generated at the event. The success of the 2010 campaign continued in 2011, as volunteers pick up more trash and become more aware of the trash they are generating, its proper disposal, and the effect it has on stormwater quality.

Performance Standard 3-10

Collectively organize events targeted to residents and population subgroups			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.3.11 Pollutant-Specific Outreach

The Permit requires the Permittees to coordinate to develop outreach programs that focus on the following specific pollutants of concern: metals, urban pesticides, bacteria, and nutrients. For effectiveness in delivering these messages they were incorporated into the other outreach programs requirements of a multimedia campaign and retail partnerships with auto shops, pet stores and home improvement stores/nurseries.

To focus on nutrients good gardening techniques were identified as a more understandable surrogate for the public as communicating that “nutrients” are a bad thing would create an additional hurdle to the ultimate goal of changing behavior. This information along with pesticide BMPs were distributed at retail nurseries throughout the county. Bacteria from pet waste have been an ongoing target of the program and new material was created during the permit year and given to pet stores to distribute. As stated in the permit the metals pollutant-specific outreach is addressed through the industrial-commercial inspection program.



Various BMP Brochures

Performance Standard 3-11

Implement outreach programs focusing on pollutants of concern			
	Yes	No	In Progress
Metals	<input checked="" type="checkbox"/>		
Urban Pesticides	<input checked="" type="checkbox"/>		
Bacteria	<input checked="" type="checkbox"/>		
Nutrients	<input checked="" type="checkbox"/>		

3.5 YOUTH OUTREACH AND EDUCATION – PO3

This Control Measure ensures that the Permittees either provide school districts within the County with outreach materials (including, but not limited to videos, live presentations, and other information), provide funds to the Environmental Education Account to educate school-age children about stormwater pollution, or submit a Youth Outreach Plan.

Educational outreach to children is an important way to affect a change in behavior. Outreach to children not only changes behavior of the next generation, but children also act as watchdogs over their parent's behavior. Because of this the Program and the individual Permittees have been conducting public outreach with a youth component for many years. Their experience with the local schools in Ventura County and developing programs targeting school-aged children have provided valuable input in the selection of the youth outreach option and the development of a Youth Outreach Plan (Plan) submitted to the Regional Board in July of 2009.

The document summarizes the Program's experience in developing and presenting outreach material to school-aged children, and demonstrates how that experience led to the rationale behind the selection of the Permit required Youth Outreach Plan option. The Plan is described in detail and includes the ground work of identifying what Ventura County youth know about stormwater pollution, where they get their information, and which watershed pollution concepts need additional development. This information was then used to prepare the creative objectives for a media campaign aimed at changing behavior to improve the quality of stormwater runoff. The target audience includes Ventura County youth from kindergarten through high school. The media outlets, broadcast frequency and number of impressions expected are outlined in the media campaign. Finally, the Plan includes methods of measuring program effectiveness and providing feedback for continual improvement of the Youth Outreach Plan to give the next generation the understanding needed to improve the stormwater runoff quality in Ventura County.

Community for a Clean Watershed's efforts towards youth continued to build on last year's outreach when a specific plan was created to reach 50% of all Ventura County school children (K-12) once every two years to comply with the Permit. With less than 150,000 school aged children enrolled in Ventura County schools, this translates to reaching approximately 75,000 in that target every two years. While that goal was met and exceeded, the Community for a Clean Watershed continues to speak to this important audience with a targeted media plan and a creative strategy that appeals to youth. Television, radio, and mall posters garnered 989,849 impressions – thus reaching this audience with significant repetition. In addition, the Facebook page has a sizeable percentage of young fans, allowing for a consistent message to be delivered to youth.

KCAQ School Tour – On-Campus with Middle and High School Youth

Ventura County's Community for a Clean Watershed launched a new youth outreach campaign in FY12 to help reduce trash in the county's watershed. Q104.7-FM radio on-air personalities Joey Boy and Quay visited 26 Ventura County middle and high schools in fall 2011 to spread the word about keeping trash out of the county's waterways, storm drains and off local beaches. During the school tour, students were treated to prizes and giveaways as well as a powerful demonstration of the 13,763 cigarette butts and filters collected at last year's local Coastal Cleanup Day. The awareness campaign's message, which focused on "*A Day in the Life of Ventura County's Watershed*," was brought home to over 23,000 school-aged children at lunchtime events. In addition to the 60-second commercials, on-air radio elements included 35 weekly promotional announcements voiced by a popular personality, giving an endorsement

of the message. Posters were developed and displayed to further tie the message into the school events and a Watershed bookmark was given to all attendees as a reminder.



A couple photos from the KCAQ School Promotion



Bookmark Givaway

Facebook Page

With over 570 fans, the Facebook page allows the Community for a Clean Watershed to keep Ventura County residents and youth engaged and works in conjunction with other outreach. Consistent posts create ongoing communication with fans that are likely to be socially aware. Posts are engaging, including information about local events for Earth Day and/or Coastal Cleanup Day, and interesting local facts.



Sample Facebook Posts

3.4 BUSINESS OUTREACH – PO4

The Permit requires the Permittees to develop and implement both a corporate outreach and a small business assistance program to educate and inform corporate franchise operators, local facility managers, and small businesses about stormwater regulations and BMPs to reduce the discharge of pollutants in stormwater.

3.4.1 Corporate Outreach

Develop Corporate Outreach Program (due by July 8, 2012)

The Permittees must work with other regional or statewide agencies and associations such as the California Storm Water Quality Association (CASQA) to develop a Corporate Outreach program to educate and inform the following corporate franchise operators and/or local facility managers (at a minimum) about stormwater regulations and BMPs.

- Four (4) Retail Gasoline Outlet (RGO) Franchisers
- Four (4) Retail Automotive Parts Franchisers
- Two (2) Home Improvement Center Franchisers
- Six (6) Restaurant Franchisers

Educational materials for RGOs, and restaurants have been developed by the Permittees and are distributed to local facility managers during inspections. These facilities are inspected every two years. During the inspection the inspector meets with the facility manger, effectively complying with this permit requirement. Automotive part stores are included in the retail partnership program to help educate the consumers shopping at their locations. The local facility manager's permission is needed to display the brochures, at this opportunity regulations and BMPs are explained. Under the nursery inspection program some Permittees are including home improvement centers due to the size of their gardening sections. Again the business inspection program satisfies the requirement by meeting with the local facility manager during the inspection.

3.4.2 Business Assistance Program

Best Management Practices Fact Sheets

Targeting types of businesses that have significant potential to contribute to stormwater pollution, Watershed Protection Tips one page fact sheets were created to outline best management practices for six categories of activities. Each BMP fact sheet is available on the Community for a Clean Watershed website, where they can be read or printed for distribution. 10,800 were printed for distribution through Permittees.

Provide Consultation Regarding Business Responsibilities

On-site, telephone or e-mail consultation is required to help business reduce the discharge of pollutants. The Permittees provide on-site consultation regarding the responsibilities of businesses to reduce the discharge of pollutants, during inspections; this requirement is covered in Section IV Industrial Commercial Programs. These trained and knowledgeable inspectors are also available to respond to questions via phone or email.



Best Management Practices Fact Sheets

Distribute Educational Materials to Specific Businesses

As mentioned above, the Industrial Commercial Program is responsible for the distribution of information to businesses. This occurs mostly at inspections, but may also be done when obvious problems are reported. An opportunity to disseminate this information to new businesses before they are in operation is through the business license program. All businesses need a business license to operate legally in a jurisdiction. It is at that time that the permittees are able to distribute information regarding stormwater regulations and appropriate BMPs for their operations. The Program has developed many specific fact sheets over the years for this purpose. The fact sheets may be distributed with the business license, or the proprietor may be directed to the website for the information.

3.5 EFFECTIVENESS ASSESSMENT – PO5

3.5.1 Behavioral Change Assessment Strategy

The Permit requires the Permittees to develop and implement a behavioral change assessment strategy based on current sociological data, and studies to determine whether the Public Outreach Program is demonstrably effective in changing the behavior of the public.

The Ventura County Watershed Permittees are committed to tracking performance of their outreach efforts. To that end, periodic research surveys are conducted to measure awareness, perceptions and the actions taken by Ventura County residents to protect the local Watershed. The research also gives insight about whether outreach messaging is effective along with providing some insight into local media preferences. The following summarizes the 2012 Adult Research Survey, which is the fourth survey since outreach started five years ago.

Performance Standard 3-12

Develop and implement a behavioral change assessment strategy based on current sociological data and studies to determine whether the Public Outreach Program is demonstrably effective in changing the behavior of the public.			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>		

3.5.2 Adult residential panel survey – June 2012

Methodology

A web survey was used as the method of data collection. There were 30 completed surveys from each of the 10 cities and unincorporated areas of Ventura County. Study participants had to be involved in decision making for their home and were required to live in Ventura County for at least 2 years. In addition, they were recruited according to specific demographic criteria, which have evolved somewhat over the four survey periods to better reflect the changing demographics of Ventura County.

The study asked questions on how the responder felt about the seriousness of different environmental problems; whether they agreed with the accuracy of statements regarding the environment and responsibility, the impact of pollutants on the environment, and their concern for the environment; finally respondents were asked if they had adopted any new behaviors to protect the environment.

The following highlights the changes in understanding, evolving attitudes and the most likely watershed protection behavior practices:

Highlights

- Pollution of the ocean is viewed with the highest rate of seriousness (62%), a 3% increase since 2010.
- Perceived seriousness of pollution of local lakes, creeks, and rivers were rated equal to litter on the beach (50%).
- There was a significant increase in understanding both watershed definition and characteristics in 2012/2010, 5% and 7% respectively.
- Possibility of polluted runoff without rain (87%)
- The inclination to consider the health of the watershed as an individual’s responsibility was slightly higher, 4%, (70%)
- In the current study, understanding ‘toxic yard runoff prevention’ dropped -6% (46%), but in general a weak result for all four surveys.
- The same pollutants were perceived as having a higher negative impact 2012/2010, but at significantly increasing levels:
 - Used motor oil 4% (89%)
 - Cigarette Butts 13% (84%)
 - Driveway fluids 6% (83%)
 - Litter 8% (82%)

- Weed Killer/Herbicides 7% (81%)
- Garden Pesticides 3% (74%) *Seriousness trending upward.*
- Pet Waste 17% (68%)
- Lawn Fertilizers 11% (63%) *Seriousness trending upward.*
- Of greatest concern were the following:
 - Pollutants draining -3% (83%)
 - Locally caught fish (74%)
 - Impact on plant/animal life -6% (72%)
 - Swimming in polluted water (71%)
 - Keeping gutters/storm drains clear -4% (70%)
 - Litter on streets and highways -8% (61%)
- Respondents claim to have adopted, on average, 2.54 watershed protection practices in the past year (down from 4 in 2010) and say they have been following best practices for more than one year. (Same as 2010 in slightly different priority)
- The behaviors most frequently practiced were;
 - Picking up litter in front of one's home or business, 5% (87%)
 - Pick up pet waste, -11% (86%) among those who own a pet
 - Take used motor oil or car fluids to a designated disposal/recycling center, -5% (83%) among those who practice this
 - Check for leaks from your automobile, (80%)
 - Use a broom rather than hose to sweep, -3% (77%)
 - Reduced usage of pesticides in general, 3% (73%)
 - Read directions before applying pesticides (70%)
- Half maintain that the responsibility of their yard/landscaping lies with their gardener. Sample is similar to 2010 at 49%.
- Overall, 35%, (a significant 7% increase over 2010) of the sample was able to recall one or more of the various ads.
- 33% of respondents were able to recall hearing or seeing something regarding watershed protection, (-4%) since 2010.
- Outdoor signs were recalled most and "Gutter Pick It Up" had the highest recall (18%).

Insights

- Overall there is a moderate increase in concern over litter issues from 2010 with biggest increase over litter on the beach +7%.
- Overall, concerns expressed in the current survey are slightly higher than 2010 levels.
- Most significant increases were also focus of outreach and include pet waste, cigarette butts, yard runoff and yard waste.
- For the most part, the differences in the understanding and perceived levels of watershed pollution between those who do their own landscaping and those who have a gardener is not very different.
- However, in terms of translating their perceptions into actions/behaviors those who landscape themselves are far more likely to adopt corrective behaviors than those who have a gardener do the landscaping.
- Demographically speaking, the core group that demonstrate both an understanding of the problems and are willing to "pitch in" include:
 - More Caucasians;
 - those in the 35-54 age range;
 - home owners; and

- female.
- Educational and income levels did not reveal significant differences.

Trends

- There is a slight declining trend for individual responsibility and increasing trend for county responsibility.
- Although still relatively high, extreme levels of concern over issues surrounding watershed pollution are trending downward.

Summary

- Perceived seriousness of watershed pollution-related issues are slightly higher,
- Significant increase in the understanding of a ‘watershed’ and recall of our outreach messages,
- Recognition of the serious impact of various pollutants is trending upward,
- Majority believe that our watersheds are polluted and express concern over the impact it will have on their family, but...
- Concern over watershed pollution-related issues of greatest concern is trending down and the number of ‘new’ behaviors decreased.

Opportunity

- Make people ‘care’ enough to connect their understanding, perceptions and concerns into a willingness to take greater action.

3.5.3 Summary of Effectiveness

In its seventh year of developing educational public outreach campaigns, brochures, and posters, the Clean Watershed website and now a Facebook page, the Community for a Clean Watershed program continues to successfully raise awareness among Ventura County residents on the issues impacting the health of Ventura County’s watersheds. This year, several elements were added, achieving the following:

- Generated a second commercial in the trash series, capitalizing on a spokesperson who appeals to all ages – and graphically driving home the message of how much trash is added to the local Watersheds.
- Crafted elements to complement the “Day in the Life” campaign, including radio, transit shelters, and posters.
- Built on two years of a youth campaign, generating almost a million impressions to Ventura County students.



The Community for a Clean Watershed logo

- Delivered the general Watershed and trash messages into middle and high schools through a collaborative effort with a popular local radio station.
- Reminded residents about positive actions they can take with their yard waste to protect the Watershed.
- Established consistent communications with our Community for a Clean Watershed Facebook community.
- Continued to develop relationships with local media for additional media at no charge.

3.5.4 Conduct Annual Effectiveness Assessment

Effectiveness assessment is a fundamental component required for the development and implementation of a successful storm water program. In order to determine the effectiveness of the Public Outreach Program Element, a comprehensive assessment of the program data is conducted as part of the Annual Report. The results of this assessment are used to identify modifications that need to be made to the program. Each year the effectiveness assessment is reviewed and revised as necessary.

By conducting these assessments and modifying the Program Element as necessary, the Permittees ensure that the iterative process is used as an effective management tool. Due to the types of data collected for the Public Outreach Program, current and future assessments will primarily focus on Outcome Levels 1, 2, and 3.

- Outcome Level 1 (L1) answers the question: Did the Permittees implement the components of the Permit?
- Outcome Level 2 (L2) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly increased the awareness of its target audience?
- Outcome Level 3 (L3) answers the question: Can the Permittees demonstrate that the control measure/performance standard changed a target audience's behavior, resulting in the implementation of recommended BMPs?

The following is an assessment regarding the effectiveness of the Public Outreach Program.

PO1 – Public Reporting

The Permittees have identified staff to serve as contact persons for public reporting. **(L1)**

The Permittees maintain two types of public reporting hotlines, one for general stormwater information and the other for reporting water pollution problems. **(L1)**

The Permittees are promoting and publicizing the public reporting hotlines and contact information. The information is available on Permittee web sites and is published in the government pages of the local phone book and other appropriate locations. **(L1)**

The Permittees are raising awareness about the public reporting hotline numbers. **(L2)**

PO2 – Public Outreach Implementation

The Permittees have developed and are implementing the public outreach program that provides key stormwater messages. **(L1)**

- Education of Ethnic Communities – The Permittees have developed and implemented a strategy to educate ethnic communities through culturally effective methods. The Permittees educated ethnic communities by reaching out to the Hispanic community in Ventura County via Spanish language advertising in the media. In 2011/12, Spanish language advertising accounted for approximately 15% of the annual media impressions.

- Storm Drain Inlet Markers and Signage – The Permittees have labeled or marked 99.7% of the storm drain inlets for the entire storm drain system and maintain the stencils/markers through the Public Agency Activities Program. In addition, 100% of all public access points to creeks and channels have signage with language that discourages illegal dumping, this includes access points that are outside of Permittee jurisdiction.
- Educational Materials – The Permittees have developed and are providing a variety of stormwater pollution prevention outreach materials, including those for specific pollutants and activities. The materials include pamphlets, brochures, and BMP posters. These are provided via a number of mechanisms, including at community events, at specific businesses, utility billing inserts, and the Countywide stormwater Web site (cleanwatershed.org/). In the 2010/11 permit year, the Permittees met the Permit requirement by distributing pollutant-specific outreach materials to the following business types: automotive parts stores; home improvement centers, lumber yards, and hardware stores; and pet shops and feed stores. In addition, the Permittees distributed activity-specific stormwater pollution prevention educational materials to residents regarding the following activities: proper disposal of litter, green waste, and pet waste; proper vehicle maintenance; lawn care; and water conservation practices.
- Mixed Media Campaigns – The Countywide program has continued to work with a local public relations agency, the Agency, to develop and implement Community for a Clean Watershed campaigns. The Permittees have provided the public with various stormwater-related articles or messages via radio and public access cable channel PSAs, movie theater slides, print ads (including newspaper), signage on outdoor bulletins and at transit shelters, and Web site banners. During 2011-2012, the Permittees conducted a total of three campaigns (Green Waste and Youth, and Trash) for an estimated 7.39 million total impressions through mixed media campaigns.
- Countywide Stormwater Web Site – The Permittees continue to maintain and utilize both Web sites (cleanwatershed.org/ and vcstormwater.org/) to provide regularly updated outreach to the public.
- Community Events – The Permittees outreached to the general public by sponsoring, organizing, and/or exhibiting at multiple community events and providing information to event attendees. These events included Coastal Cleanup Day; a total of 3,167 volunteers collected trash at 24 sites countywide.
- Pollutant-Specific Outreach – The Permittees are implementing a pollutant-specific outreach program rotating through metals, urban pesticides, bacteria, and nutrients in coordination with multi-media campaigns and retail partnerships with auto shops, pet stores, and home improvement stores and nurseries. Pollutant-specific outreach materials have been distributed via these retail partnerships.

As a result of the above efforts, in 2011/12, an estimated total of 7.39 million impressions were made, well exceeding the goal of five million stormwater quality impressions per year.

PO3 – Youth Outreach and Education

The Program's efforts towards youth continued to build on last year's outreach when a specific plan was created to reach 50% of all Ventura County school children (K-12) once every two years to comply with the NPDES Permit #CAS004002. With less than 150,000 school aged children enrolled in Ventura County schools, this translates to reaching approximately 75,000 in that target group every two years. While that goal was met and exceeded during the last Permit year with over 700,000 media impressions made on kids 6-11 and teens, the Program continues to speak to this important audience with a targeted media plan and a creative strategy that appeals to youth. Television, radio, and mall posters garnered 904,090 impressions – thus reaching this audience with significant repetition. In addition, the Facebook

page has a sizeable percentage of young fans (58%), allowing for a consistent message to be delivered to youth. This year the Program launched a new in-school youth outreach campaign with Q104.7-FM radio on-air personalities who visited 26 Ventura County middle and high schools in fall 2011. (L1)

PO4 – Business Outreach

The Permittees provided on-site consultation to businesses during inspections regarding their responsibility to reduce discharge of pollutants. Inspectors are also available for consultation via telephone and e-mail. (L1)

The Permittees distributed educational materials to specific businesses during inspections, when business licenses are obtained, and when problematic businesses are reported. In addition, information is made available on the Countywide Web site, and businesses are referred to the Web site as appropriate. (L1)

PO5 – Effectiveness Assessment

The Ventura County Watershed Permittees are committed to tracking performance of their outreach efforts. To that end, periodic research surveys are conducted to measure awareness, perceptions and actions taken by Ventura County residents to protect the local Watershed. The research also gives insight into whether outreach messaging is effective, along with providing some insight into local media preferences.

In order to establish a baseline of both our adult and K-12 target audiences' understanding of the watershed and surrounding stormwater pollution web surveys are routinely conducted.

The research results indicate a clear connection between key outreach messages and increases in understanding and shifts in behavior/attitude. This supports continued use of new and traditional media to educate youth on watershed protection.

The results outlined above show that the Public Outreach program efforts have increased awareness among Ventura County residents regarding some key issues impacting the health of Ventura County's watersheds. (L2) (L3)

3.5.5 Public Outreach Program Element Modifications

On an annual basis, the Permittees plan to evaluate the results of the Annual Report, as well as the experience that staff has had in implementing the program, to determine if any additional program modifications are necessary to comply with the Clean Water Act requirement to reduce the discharge of pollutants to the maximum extent practicable. Any key modifications made to the Public Outreach Program Element during the next fiscal year will be reported in the following Annual Report.

4 Industrial/Commercial Facilities Programs

4.1 OVERVIEW

The purpose of the Industrial/Commercial Facilities Program Element is to effectively prohibit unauthorized non-stormwater discharges and reduce pollutants in stormwater runoff from industrial and commercial facilities to the maximum extent practicable (MEP).

The daily activities of many businesses create a potential for pollutants to enter a storm drain system through both intentional and unintentional actions. The Permittees have developed programs to address this source of pollutants through inspections of targeted businesses and by providing educational outreach and enforcement if needed. These efforts include information on the potential for illicit discharges and illegal connections from businesses, assistance in the selection and use of proper BMPs, and may result in formal enforcement action and fines if environmental rules are ignored.

The program for industrial and commercial facilities is accomplished by tracking, inspecting, and ensuring compliance at industrial and commercial facilities identified as critical sources of pollutants in stormwater. Industrial and commercial facilities are managed under a single Program Element due to the similarities among these types of facilities and the effort involved to implement the program.

The Permittees use the Business Outreach and Illicit Discharge/Illegal Connection Subcommittee meeting to coordinate and implement a comprehensive program to control pollutants in stormwater discharges to municipal systems from targeted commercial facilities. The Subcommittee is comprised of representatives of the Permittee cities and other municipal staff from various departments (e.g. Environmental Health, Environmental Services, and Wastewater Services). The subcommittee provides an opportunity for the Permittees to learn from each other's experiences and develop and share resources. Each Permittee has implemented an Industrial/Commercial Business Program using the control measures identified below.

4.2 CONTROL MEASURES

Several Control Measures and accompanying performance standards have been developed by the Permittees to ensure that the Industrial/Commercial Facilities Program requirements found in the Permit are met and provide information for optimizing the Program. At the end of this chapter these control measures are evaluated to determine the effectiveness of this program element.

The Industrial/Commercial Facilities Program Control Measures are organized to be parallel to the organization of the Permit and consist of the following:

Table 4-1 Control Measures for the Industrial/Commercial Facilities Program Element

IC	Control Measure
IC1	Facility Inventory
IC2	Inspection
IC3	Industrial/Commercial BMP Implementation
IC4	Enforcement
IC5	Training
IC6	Effectiveness Assessment

4.3 FACILITY INVENTORY – IC1

The Facility Inventory Control Measure addresses the need to develop and maintain a complete and comprehensive database of industrial and commercial facilities that are determined to be critical sources of stormwater pollution. Information for the database is primarily derived from new business licenses and sanitary sewer connection permits. Facility inspections performed by the Permittees also continues to provide the details needed for the database. Some Permittees perform surveys of the industrial zoned areas in their jurisdiction to help maintain their industrial facility inventory. This survey is usually associated with industrial waste pretreatment inspections required for agencies operating a wastewater collection system.

4.3.1 Maintain and Annually Update the Industrial and Commercial Facility Inventory

As required by the Permit the Permittees maintain an inventory of industrial and commercial facilities within their jurisdictions, including those covered under the state Industrial General Permit. This inventory identifies the type of business, the watershed it is located in, and inspections and enforcement action history.

The Permittees supplement their inventory by utilizing data from County Environmental Health to obtain current facility numbers prior to planned inspections. The Regional Water Board’s website also provides useful information for all Industrial General Permit holders and is used extensively for that program. These data were first compiled during the 2009/10 reporting period and will be updated on an ongoing basis as the next round of inspections discovers new facilities, as well as companies that are no longer in operation. Some businesses, such as restaurants, have a high turnover with new ones opening each year and many permanently closing their doors. Because of the continued turnover of businesses the Industrial and Commercial inventory can never be assumed to be 100% accurate, it is a snap shot in time and will be continually updated as information becomes available. The current development of inventory for 2011/12 is summarized in the following Tables.

Performance Standard 4-1

<i>Did the Co-permittees maintain and update the Industrial and Commercial Facility Inventory</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>	<input checked="" type="checkbox"/>		
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>		<input checked="" type="checkbox"/>	
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

Figure 4-1 Commercial/Industrial Facilities Inventory

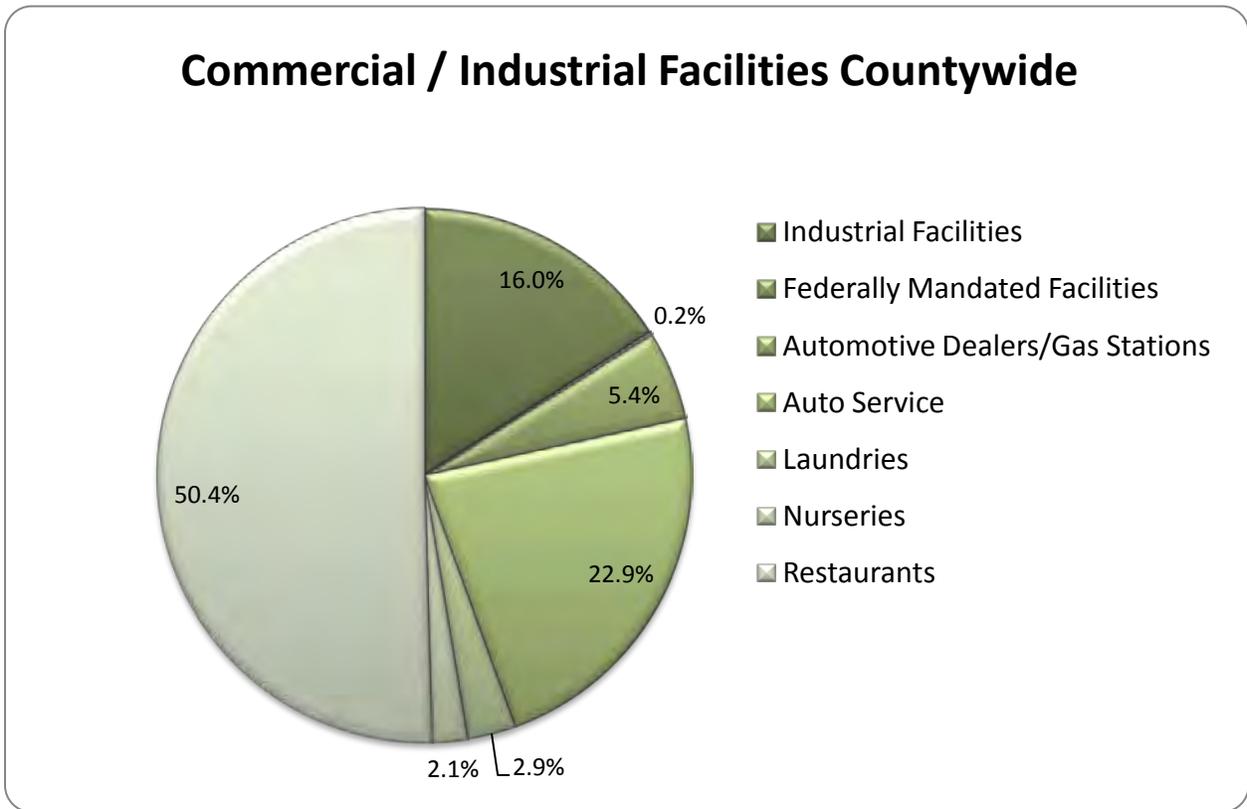
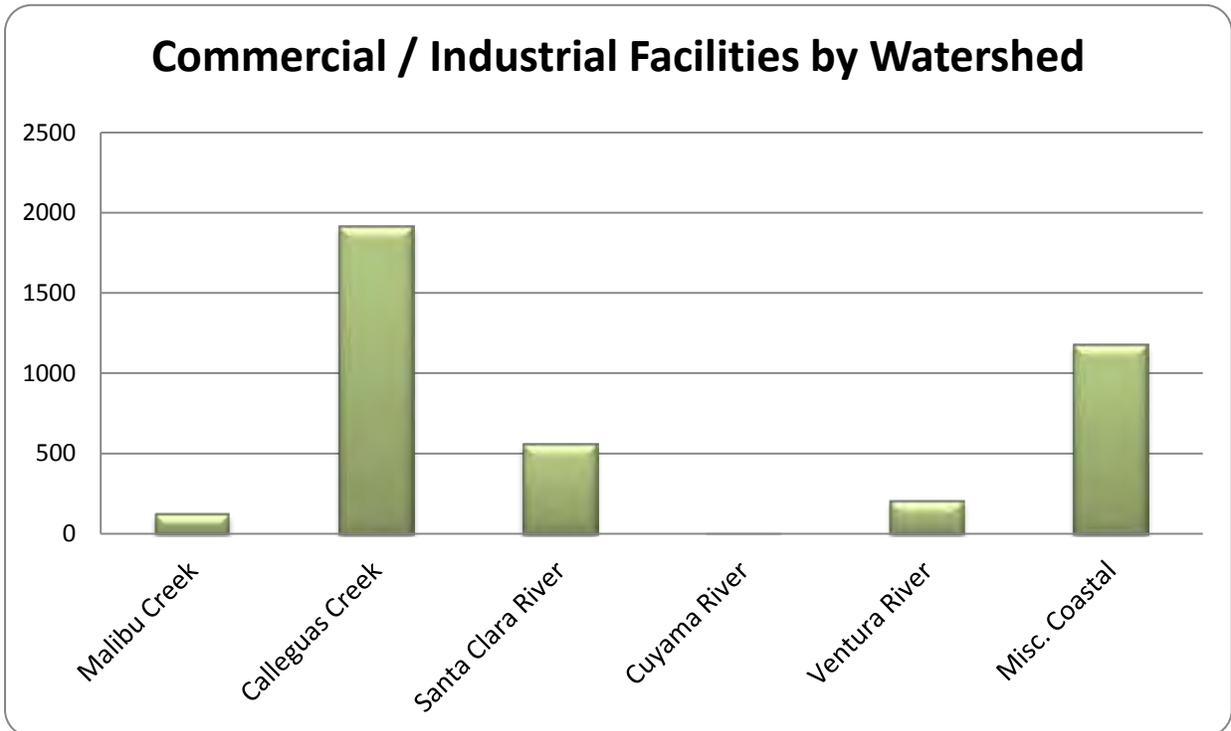


Figure 4-2 Commercial/Industrial Facilities by Permittee



Figure 4-3 Commercial Industrial Facilities by Watershed

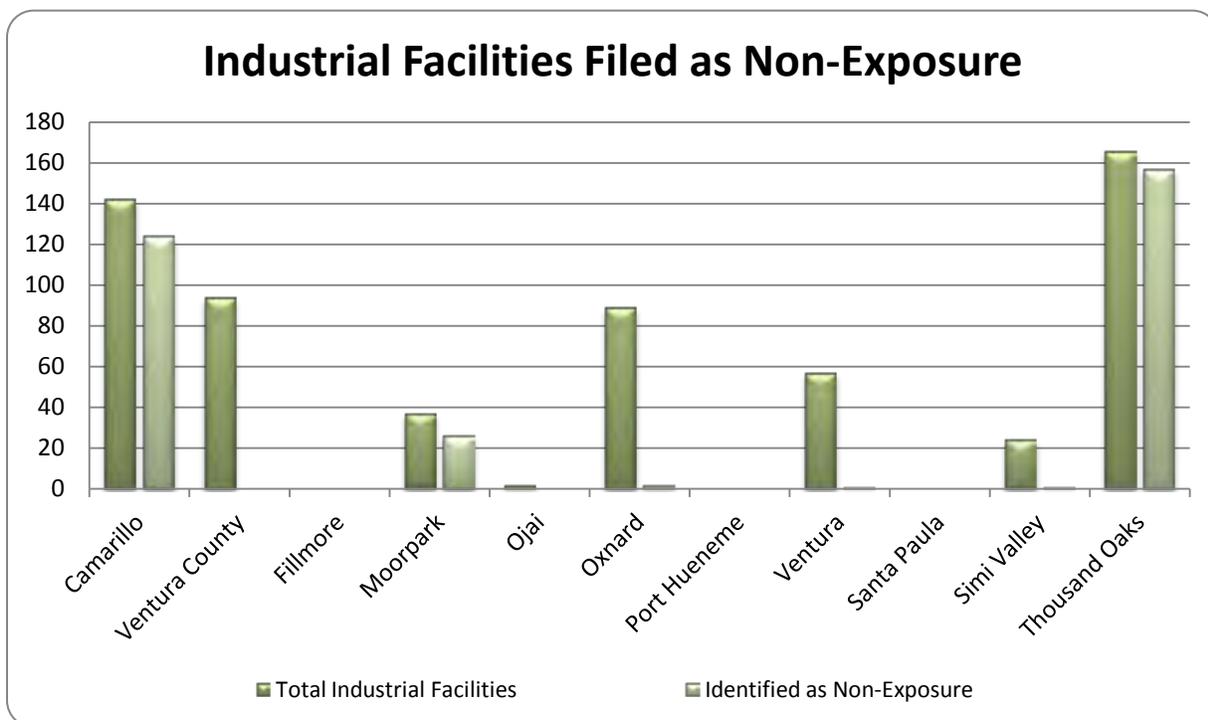


4.4 INSPECT INDUSTRIAL AND COMMERCIAL FACILITIES TWICE DURING PERMIT TERM

To satisfy the requirement of inspecting these facilities twice during the Permit term the Permittees began their inspection of industrial and commercial facilities in the 2009/10 Permit year. With respect to industrial facilities, if the initial inspection revealed no risk of exposure of industrial activities to stormwater at a facility, then that facility may be categorized as *No Exposure Status*. A second inspection is required at a rate that provides annual re-inspection of a minimum of 20% of all such facilities determined to have non-exposure.

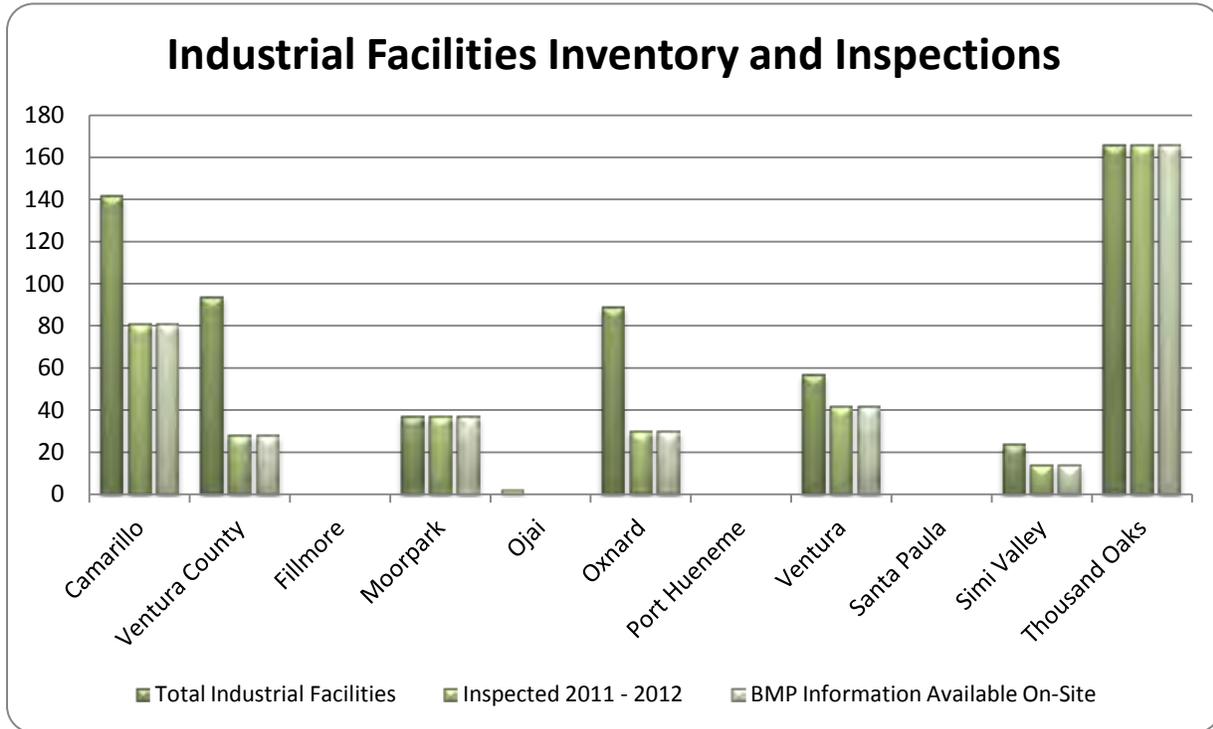
All initial industrial and commercial facility inspections must be completed no later than July 8, 2012. A minimum interval of six months between the first and second compliance inspection is required at all industrial and commercial facilities. It is possible that a site will be visited sooner than six months if requested by the Regional Board staff to assist with their investigations, or if an illicit discharge is suspected.

Figure 4-4 Industrial Facilities Filed as Non-Exposure



The permit requires the first industrial and commercial inspections be completed by July 8, 2012. The inspection programs are ongoing with continual updates to the inventory and facilities being re-inspected at least once more during the permit term. The status of the industrial commercial inspection program through the end of the reporting period is represented in the following tables.

Figure 4-5 Industrial Facilities Inventory and Inspections



Industrial Facilities includes U.S. EPA Phase I, II Facilities required to obtain coverage under the Industrial Activities Stormwater General Permit (IAGSP). These facilities are identified by either the Standard Industrial Classifications (SIC) or the North American Industry Classification System (NAICS). Facility ownership (federal, state, municipal, private) are not factors in this definition and so the inventory includes facilities such as the Naval Base Ventura County at Point Mugu.

**COUNTY OF VENTURA UNINCORPORATED AREA
STORMWATER MANAGEMENT PROGRAM**

**Stormwater Inspection Checklist
INDUSTRIAL AND FEDERALLY REGULATED FACILITIES**

INSPECTION TYPE

- INITIAL INSPECTION (see 07/01/2012)
- 1st Follow-up after INITIAL INSPECTION
- 2nd Follow-up after INITIAL INSPECTION
- 2nd Inspection of facilities with Exposure (6 months after INITIAL INSPECTION and not later than 07/01/2015)
- 1st Follow-up after 2nd inspection of facilities with Exposure
- 2nd Follow-up after 2nd inspection of facilities with Exposure
- 2nd Inspection of NON-EXPOSURE FACILITIES (minimum 20% annual)
- Complaint Response

INSPECTOR NAME: _____ INSPECTION DATE & TIME: _____

FACILITY NAME: _____

FACILITY ADDRESS: _____

FACILITY CONTACT NAME: _____ PHONE: _____

FACILITY CONTACT SIGNATURE (ink/typed name): _____

FACILITY'S NAICS CODE: _____

FACILITY CATEGORY: _____

THIS FACILITY IS COVERED UNDER:

- Industrial Activities Stormwater General Permit (IAGSP) WQD # _____
- Is SWPPP available on the site? YES / NO
- Other Permit. Specify: _____
- No Exposure Certification, Notice of Non-applicability, No Discharge
- SWQCS Approval Letter received on: _____
- None

FACILITY IS LOCATED BY ONE OF THE FOLLOWING WATERSHEDS:

- Calleguas Creek
- Fillmore Creek
- Santa Clara River
- Ventura River
- Cuyama River
- Mac Coastal

A. Brief Description of Facility Operations:		Yes	No	N/A
Does this facility discharge to MGAs that directly discharge to CGAs or SDQS listed watersheds?				
If YES, make a note if BMPs are sufficient to maintain good SWP				
List potential problems, used and status of resources to determine:				
Describe activities that may contribute to pollution site runoff:				
BMP	B. Stormwater Management Criteria	Yes	No	N/A
DCS	Does the facility have stormwater discharges and controls being implemented to allow stormwater to be managed on-site?			

Page 1 of 2

Industrial facilities inspection form

Figure 4-6 Federally Mandated Facilities Inventory and Inspections

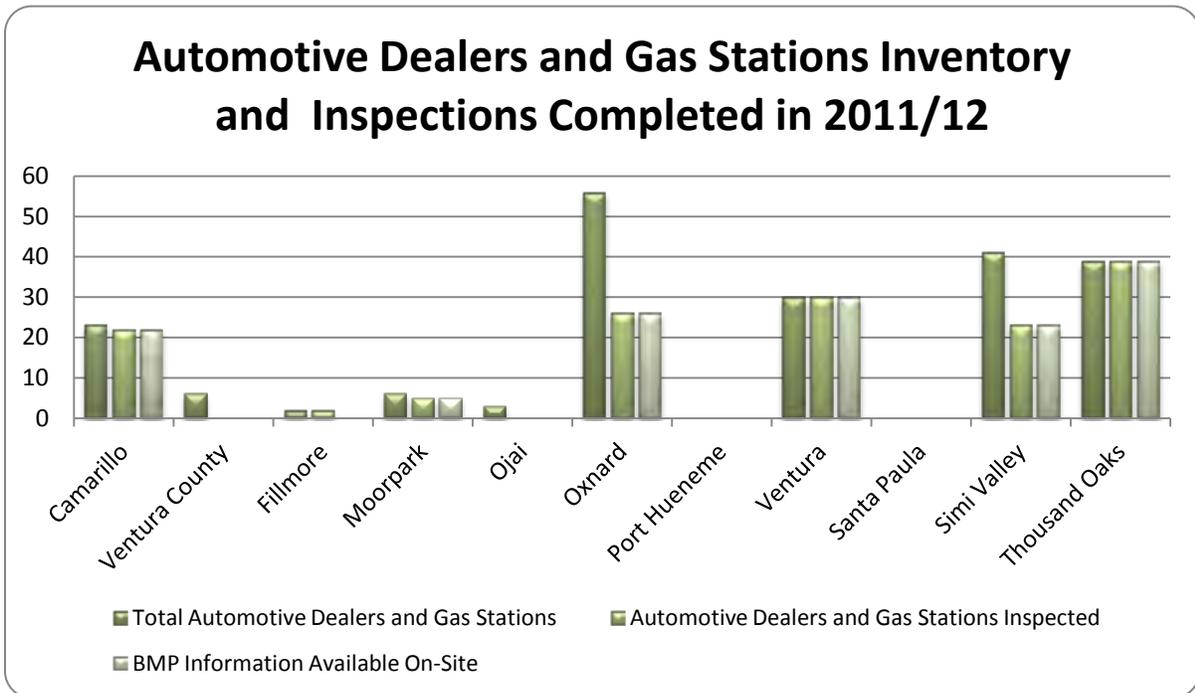


Other Federally-mandated Facilities [as specified in 40 CFR 122.26(d)(2)(iv)(C)] are also required to obtain coverage under the IAGSP. Again, facility ownership (federal, state, municipal, private) and profit motive (business or not-for-profit) of the facility are not factors in this definition. Included in this category are:

- Municipal landfills
- Hazardous waste treatment, disposal, and recovery facilities
- Facilities subject to SARA Title III (also known as the Emergency Planning and Community Right-to-Know Act (EPCRA))

Inspections are conducted at all automotive and gas station facilities even if these facilities do not have outdoor activities or storage that are exposed to stormwater. In addition, the Permittees have identified other facilities where engine oil is present and represents a potential threat to stormwater pollution, e.g., boat dealers, RV dealers, motorcycle dealers, etc. Facilities that are only inspected if they have outdoor activities or outside storage that are exposed to stormwater are auto parts stores and tire dealers.

Figure 4-7 Automotive Dealers and Gas Stations Inventory and Inspections



An inspector reviews the findings of an inspection with the business manager

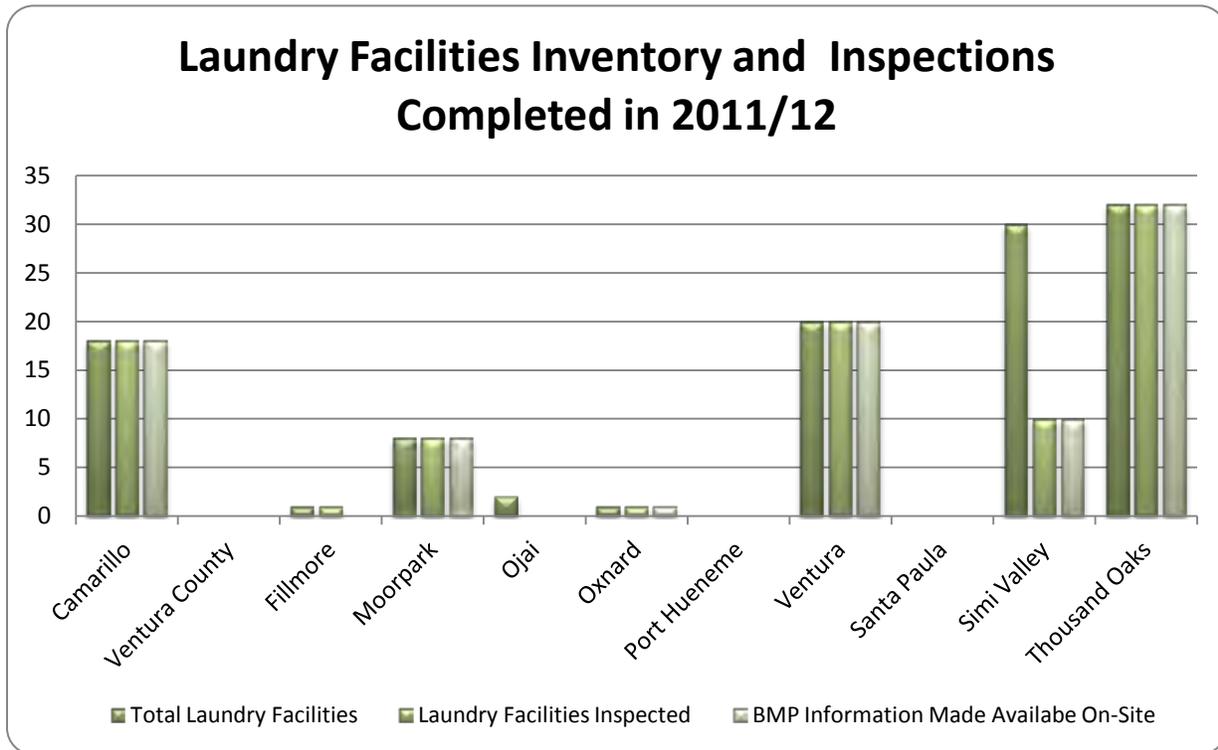
Figure 4-8 Automotive Service Facilities Inventory and Inspections



All automotive service facilities are included in the inventory for inspection, this category also includes motorcycle and boat repair if there is a potential for stormwater pollution.



Figure 4-9 Laundry Facilities Inventory and Inspections



Permittees made an effort to identify all laundry facilities in their jurisdiction that may possibly have an exposure to stormwater and therefore a possible threat to stormwater quality. Some Permittees went as far as to include dry cleaners and laundromats. All commercial laundries in a jurisdiction were identified and screened for potential exposure. If there was no exposure potential then an inspection was deemed unnecessary.

The Permit includes requirements for the Permittees to confirm that nursery operators that are exposed to stormwater implement pollutant reduction and control measures with the objective of reducing pollutants in stormwater runoff discharges. “Nurseries” comprises establishments primarily engaged in the merchant wholesale distribution of flowers, florists' supplies, and/ or nursery stock (except plant seeds and plant bulbs). The industry in NAICS Code 444220 comprises establishments primarily engaged in retailing nursery and garden products, such as trees, shrubs, plants, seeds, bulbs, floriculture products and sod, which are predominantly grown elsewhere. These establishments may sell a limited amount of a product they grow themselves.

This is interpreted by the Permittees to not include stores that may have some plants or a small nursery section although it is not their primary business. Florist that specialize in cut flowers are also not included because their business and inventory is kept indoors. However, most Permittees have extended this to include the large home improvement centers due to the size of their nursery section.

Figure 4-10 Nursery Facilities Inventory and Inspections

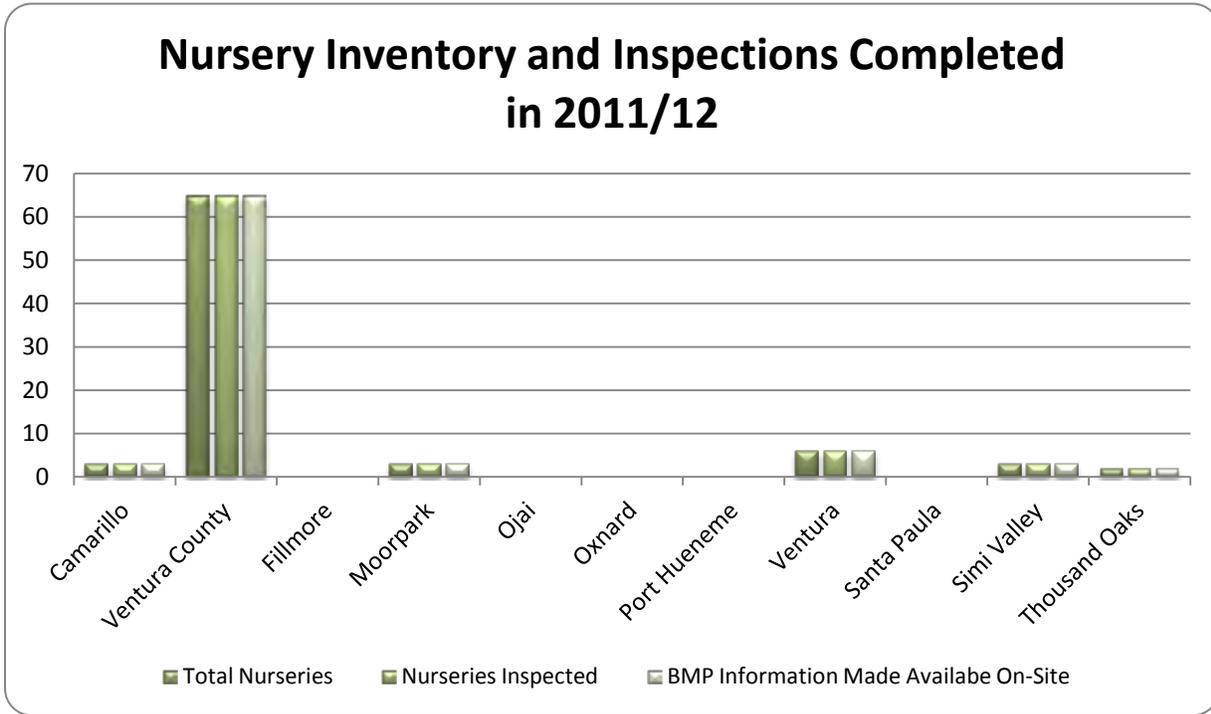
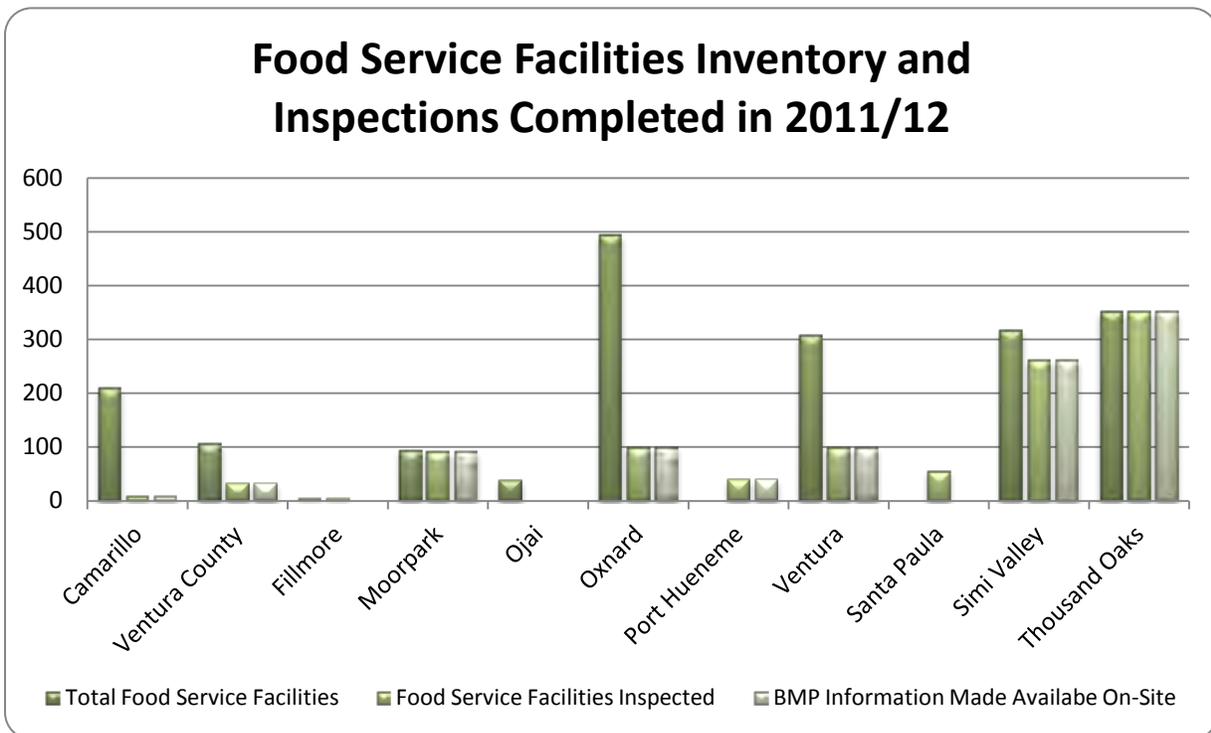


Figure 4-11 Food Service Facilities Inventory and Inspections



For the purposes of inventory and inspection the term food service facility means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC Code 5812). This will include supermarkets if they have a deli selling food which is prepared on-site, but will not include grocery stores, bakeries and candy stores not engaged in food preparation.

4.5 INSPECTION – IC2

The Inspection Control Measure establishes the inspection requirements associated with on-site visits. The inspections ensure that the facility operator is effectively implementing source control BMPs, is in compliance with municipal ordinances, has pertinent educational materials, and is not producing unauthorized non-stormwater discharges. Inspection of facilities covered under the IASGP also ensures that the operator has a current Waste Discharge Identification (WDID) number, a Stormwater Pollution Prevention Plan (SWPPP) is available on site, and the operator is effectively implementing BMPs. Stopping unauthorized discharges is the primary purpose of the inspections, however it is also just as important to educate businesses on proper disposal of wastes and other BMPs to prevent future discharges to the storm drain system. To accomplish this educational information is made available to businesses that do not immediately have it available for their staff.

4.5.1 Inspections

The Permittees’ municipal ordinances currently allow authorized officers to enter any property or building to perform inspections. On refusal to allow inspection by the owner, tenant, occupant, agent or other responsible party, the Permittees may seek an Administrative Search Warrant. All the Permittees have or are reviewing their ordinances to determine if there is a need to strengthen their ability to perform inspections, as well as the enforcement tools at their disposal to bring an uncooperative business into compliance.

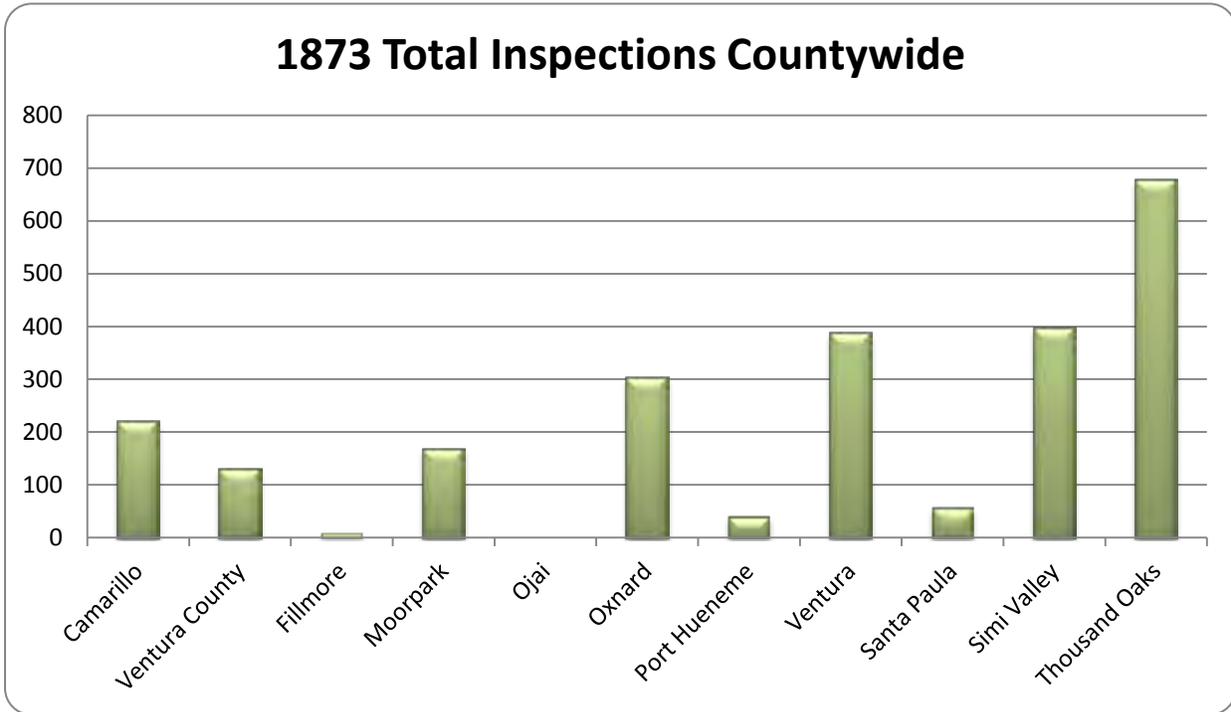
Performance Standard 4-2

<i>Begin initial inspections of commercial and industrial facilities? (inspections to be completed by July 8, 2012)</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>		<input checked="" type="checkbox"/>	
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>		<input checked="" type="checkbox"/>	
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

The vast majority of site visits performed were unannounced providing the inspectors with an honest look at daily activities of the facility. During these site visits, Permittee inspection staff would meet with the business owner/manager to review the objectives of the inspection. After performing a walk-through of the facility, inspection results were discussed with the business owner/manager. In the event a Permittee determined a facility’s stormwater BMPs were insufficient, the Permittee provided their recommendations to the facility owner/manager. Source control BMPs were recommended as a first step in BMP implementation before requiring the facility to implement costly structural BMPs. In all cases,

inspection staff informed facilities’ owners/managers that BMP implementation does not guarantee compliance nor relieve them from additional regulations, and that it is their continued responsibility to ensure that pollutants do not escape the facility.

Figure 4-12 Total Inspections Countywide



Review/Revise the Industrial Inspection and Commercial Business-Specific Checklists as Needed

In order to ensure that the inspectors conduct thorough and consistent inspections, industrial and commercial checklists have been developed for different targeted businesses. Permittee industrial inspectors receive proper training to adequately assess facilities and offer assistance in suggesting remedies. County and municipal ordinances with support from City Attorney’s and County Counsel offices also provide the proper legal backing for inspections and any necessary enforcement. Checklists are periodically updated as necessary to ensure that they provide an adequate and sufficiently comprehensive basis upon which to conduct inspections. Currently, the Program has inspection checklists for general industry, restaurants, automobile related businesses, nurseries, and laundries. Examples of the checklists are included as Attachment A.

COUNTY OF VENTURA UNINCORPORATED AREA
STORMWATER MANAGEMENT PROGRAM
Stormwater Inspection Checklist
Restaurants

INSPECTION TYPE:
 INITIAL INSPECTION (see 0701001)
 1st Follow-up after INITIAL INSPECTION
 2nd Follow-up after INITIAL INSPECTION
 3rd Inspection (6 months after INITIAL INSPECTION and no later than 0701001A)
 1st Follow-up after 2nd Inspection
 2nd Follow-up after 2nd Inspection
 Closed/Not Inspected

INSPECTOR NAME: _____ INSPECTION DATE & TIME: _____
 FACILITY NAME: _____
 FACILITY ADDRESS: _____
 FACILITY CONTACT NAME: _____ PHONE: _____
 FACILITY CONTACT SIGNATURE (acknowledging receipt): _____
 FACILITY'S SIGNATURE (DOB): _____ PERMITAL PRODUCT USED: _____
 STATUS OF COMPLIANCE: _____
 FACILITY IS LOCATED IN ONE OF THE FOLLOWING WATERWAYS:
 Carpinteria Channel Malibu Channel Santa Clara River
 San Marcos River Ojai River New Channel

SNP #	Inspection Item	Yes	No	NA
0C-10	Any stormwater discharge (runoff)? YES, note photo and describe			
0C-10 0C-04 0C-02	Any signs of erosion or storm or surface runoff gutters from possible illegal drainage activities and any signs of rutting at the top of areas or signs of erosion from rainfall events? YES, note photo and describe.			
0C-10	Are catch basins, curbs and gully sweeps AND/or perpendicular lines of swept and cleaned with a hose?			
0C-15	Is green vegetation or grass clearly maintained? SEE PHOTO SHEET.			
0C-11	Is the facility effectively responding and responding to spills and leaks?			
0C-11	Does the facility have a plan to create spill areas?			
0C-11	Are spill control measures kept in place to be maintained over by any outside party?			

Restaurant Inspection Checklist

Performance Standard 4-3

<i>Review/revise the industrial inspection checklist to be consistent with the permit</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>	<input checked="" type="checkbox"/>		
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>	<input checked="" type="checkbox"/>		
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

Performance Standard 4-4

<i>Review/revise the commercial business-specific checklist to be consistent with the permit</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>	<input checked="" type="checkbox"/>		
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>	<input checked="" type="checkbox"/>		
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

Conduct Follow-up Inspections as Necessary

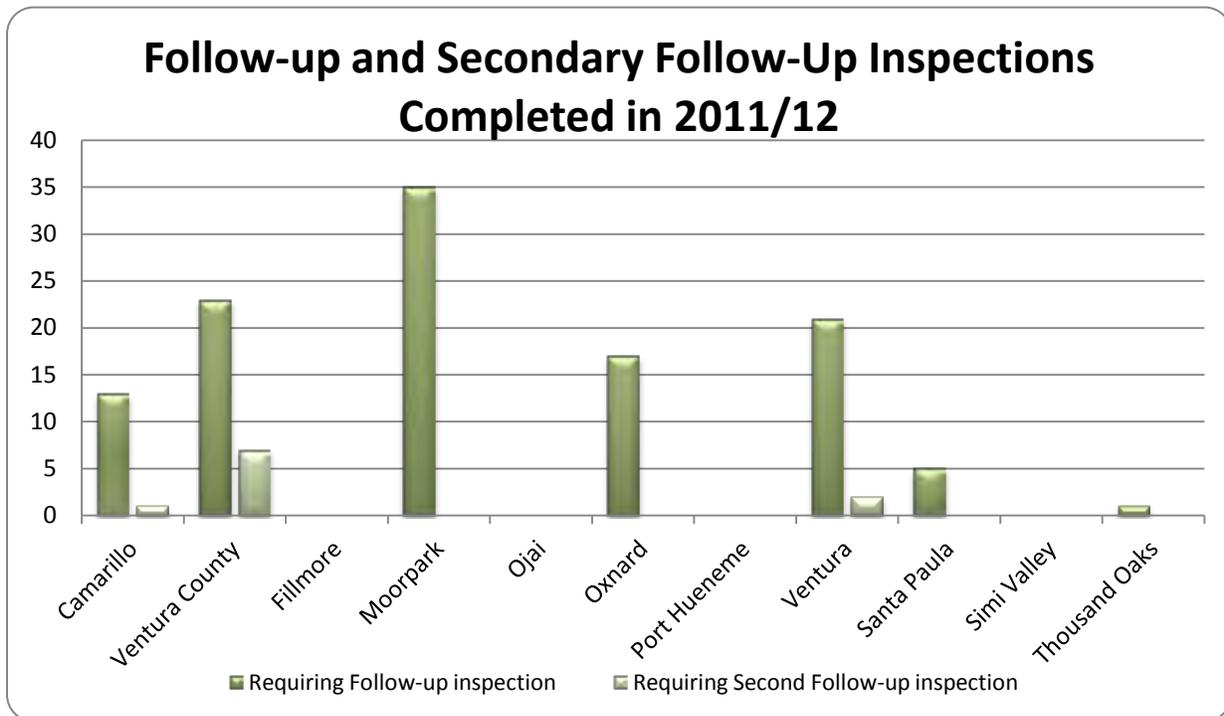
Whenever the Permittee determined that an operator had failed to adequately implement all necessary BMPs as required by the Permit, or otherwise were deemed out of compliance, the Permittee engaged in progressive enforcement action. If the facility can be brought into compliance while the inspector is still on-site a follow-up inspection is not deemed necessary. All other facilities that failed to implement all necessary BMPs were advised there would be follow-up visits. The Permit requires that re-inspection occurs within four weeks of the initial inspection. Follow-up visits may be scheduled, especially if the facility operator is difficult to get a hold of, but for the majority of businesses the follow-up inspections are unannounced surprise inspections. If continued stormwater violations were found progressive enforcement actions were initiated, and another visit was scheduled if necessary. Enforcement actions may include any of the following: Warning Notice, Notice of Violation(s), Administrative Civil Liability actions and monetary fines. These actions are described in detail and reported in Section 8 - Programs for Illicit Discharges.

Performance Standard 4-5

<i>Conduct follow-up inspections as necessary</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>		<input checked="" type="checkbox"/>	
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>			<input checked="" type="checkbox"/>
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>		<input checked="" type="checkbox"/>	
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

The number of required Initial Follow-Up Inspections and Secondary Follow-Up Inspections can be seen by Permittee in Figure 4-13 Follow-up and Secondary Inspections.

Figure 4-13 Follow-up and Secondary Inspections



4.6 INDUSTRIAL/COMMERCIAL BMP IMPLEMENTATION – IC3

The Industrial/Commercial BMP Implementation Control Measure requires industrial and commercial businesses to reduce pollutants in stormwater discharges and cease any unauthorized non-stormwater discharges to the storm drain system. Although the Permittees may provide guidance to facility operators on appropriate Source and Treatment Control BMP selection and application, the selection of specific

BMPs to be implemented is the responsibility of the discharger. The Permittees develop business specific guidance (fact sheets) that is updated as necessary to reflect new requirements and/or knowledge.

4.6.1 BMP Fact Sheets and Selection

In order to assist the industrial and commercial facilities in selecting and implementing the appropriate types of BMPs, the Permittees developed BMP Fact Sheets for industrial and commercial businesses. The BMP Fact Sheets are distributed during the inspections and made available on the Ventura Countywide Stormwater Quality Management Program's website at the following address:

http://www.vcstormwater.org/programs_business.html#business_factsheets

BMP fact sheets were updated and new ones created for several target audiences during this reporting period including:

- Building and Grounds Maintenance
- Pool and Spa Maintenance
- Commercial Pesticide Application
- Mobile Cleaning Services
- Mobile Auto Detailing and Charity Car Wash Events, and
- Building Repair and Remodeling.

These have been added to the library of fact sheets the Program has already developed for automotive service facilities, RGOs, and nurseries.

4.6.2 Distribute BMP Fact Sheets during Inspections

The Permittees distribute BMP Fact Sheets to facility owners/operators as a part of the inspection process. The development and distribution of these fact sheets, along with the inspection program where inspectors meet with the local facility managers about stormwater regulations and BMPs also serves to meet the Permit requirement for Corporate Outreach under the Public Information and Participation Program.



Fact Sheet for Pesticide Applicators

Performance Standard 4-6

<i>Ensure information on BMPs was available on site</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>			<input checked="" type="checkbox"/>
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>		<input checked="" type="checkbox"/>	
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

4.7 ENFORCEMENT– IC4

The Enforcement Control Measure outlines the progressive levels of enforcement applied to industrial and commercial facilities that are out of compliance with County and municipal ordinances and establishes the protocol for referring apparent violations of facilities subject to the Industrial Activities Storm Water General Permit to the Regional Water Board. The Enforcement Control Measure has been developed to address specific legal authority issues related to industrial and commercial facility discharges and should be implemented in coordination with the Permittees’

efforts to maintain adequate legal authority for the Stormwater Program in general.

4.7.1 Implement the Progressive Enforcement and Referral Policy

The Permittees have a progressive enforcement and referral policy so that the enforcement actions match the severity of a violation and include distinct, progressive steps initiated to bring a facility into compliance. Options are available for progressive corrective actions for repeat offenders. Inspections are performed to assess compliance with municipal stormwater ordinances and any noncompliance is managed through the enforcement policy. Noncompliance may include failure to implement adequate source control or structural BMPs, or other violations of County and municipal ordinances.

The Permittees’ facility inventory contains an “inspection findings” data field for comments pertaining to the specific facility. If there is an unsatisfactory inspection, then a comment is made in this data field and the facility is marked for re-inspection within four weeks of the date of initial unsatisfactory inspection. Past experience with facilities has shown that facility operators are cooperative and willing to bring facilities into compliance.

Performance Standard 4-7

<i>Implement a progressive enforcement policy</i>			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	<input checked="" type="checkbox"/>		
<i>Ventura County</i>	<input checked="" type="checkbox"/>		
<i>Fillmore</i>	<input checked="" type="checkbox"/>		
<i>Moorpark</i>	<input checked="" type="checkbox"/>		
<i>Ojai</i>	<input checked="" type="checkbox"/>		
<i>Oxnard</i>	<input checked="" type="checkbox"/>		
<i>Port Hueneme</i>			<input checked="" type="checkbox"/>
<i>Ventura</i>	<input checked="" type="checkbox"/>		
<i>Santa Paula</i>		<input checked="" type="checkbox"/>	
<i>Simi Valley</i>	<input checked="" type="checkbox"/>		
<i>Thousand Oaks</i>	<input checked="" type="checkbox"/>		

Implementation of Referral Policy

As a means to enhance interagency coordination, the Permittees may refer industrial business violations of County and/or municipal stormwater ordinances and California Water Code §13260 to the Regional Water Board, provided that Permittees have made a good faith effort of progressive enforcement under applicable stormwater ordinances. Referral to the Regional Water Board is required so that they can enforce the conditions of their permit on non-compliant industries. Every effort is taken at the local level to achieve compliance before referring a facility, including using the threat of calling in the Regional Board and their ability to levy hefty fines. It is possible that the Regional Board would be notified immediately if very egregious problems were

discovered at a site covered by the Industrial Activities Stormwater General Permit (IASGP). At a minimum the permit requires Permittees provide a good faith effort to bring a facility into compliance, which must be documented with:

- Two follow-up inspections
- Two warning letters or notices of violation

For those facilities in violation of municipal ordinances and subject to the IASGP, the Permittees may escalate referral of such violations to the Regional Water Board after one inspection and one written notice (copied to the Regional Water Board) to the operator regarding the violation. This is up to the discretion of the Permittee, and is only likely to be used in cases where there is a severe discharge causing or contributing to a water quality exceedance.

Such referrals are filed electronically with the Regional Water Board for any inspection that led to a notice of violation or the discovery of a non-filer. In making such referrals, Permittees are required to include at a minimum the following information in their referral:

1. Name of facility
2. Operator of facility
3. Owner of facility
4. WDID number (if applicable)
5. Industrial activity being conducted at the facility that is subject to the IASGP
6. Records of communication with the facility operator regarding the violation, which shall include at least an inspection report
7. The written notice of the violation copied to the Regional Water Board

The Permittees were able to bring all IAGSP facilities into compliance, and none were referred to the Regional Board for further enforcement.

4.7.2 Investigation of Complaints Transmitted by Regional Water Board

On occasion, Regional Board staff will receive information on an industry within a Permittee's jurisdiction that needs to be investigated in a timely manner. The Permittees implement procedures for responding to complaints forwarded by the Regional Water Board to ensure initiation of inspections within one business day. Permittees may comply by taking initial steps (such as logging, prioritizing, and tasking) to "initiate" the investigation within one business day. However, the Regional Water Board expects that the initial investigation, including a site visit, would occur within four business days. Complaint-initiated inspections include, at a minimum, a limited inspection of the facility to confirm the complaint, to determine if the facility is effectively complying with municipal stormwater urban runoff ordinances and, if necessary, to initiate corrective action.

The Permittees have (and will continue to) work closely with the Regional Water Board when a facility is identified as requiring a compliance inspection. The Permittees were able to bring all facilities into compliance that were not immediately found to be in compliance.

Table 4-2 Complaints Transmitted by Regional Water Board for Investigation by Permittees

Facility Category	Nature of Complaint	Confirmation of Complaint	Permittee Assistance and/or Corrective Action
<i>Industrial</i>			
None			
<i>Other Federally-Mandated Facilities</i>			
None			

4.7.3 Task Force Participation

The Permittees will participate in an interagency workgroup, such as the Environmental Task Force or the Storm Water Task Force, as a means to communicate information and concerns regarding stormwater enforcement actions undertaken by the Permittees. Participation in such a workgroup should facilitate communication of special cases of stormwater violations and address a coordinated approach to enforcement action.

The Ventura County Stormwater Program and Permittees, including different divisions such as CUPA or County Environmental Health, participate on the Ventura County Environmental Crimes Task Force. This task force is led by the District Attorney’s office and includes representatives from different environmental agencies including the Ventura Air Pollution Control District, California EPA, and Federal EPA. The purpose is to work together to share sensitive information on enforcement activities to increase the chances of eliminating the problem.

4.8 TRAINING – IC5

The Training Control Measure is important for the implementation of the Industrial/Commercial Program Element. An effective training program is one of the best pollution prevention BMPs that can be implemented because it provides for consistency in inspections and enforcement, gives the inspector the ability to respond to a variety of situations and questions, and ultimately encourages the inspectors to initiate behavioral changes that are fundamentally necessary to protect water quality.

Each Permittee identified inspection staff and other personnel for training based on the type of stormwater quality management and pollution issues that they might encounter during the performance of their regular inspections or daily activities. Targeted staff may include those who perform inspection activities as part of the HAZMAT and wastewater pretreatment programs as well as staff who may respond to questions from the public or industrial/commercial businesses, such as those working with business licenses.

Staff was trained in a manner that provided adequate knowledge for effective business inspections, enforcement, and answering questions from the public or industrial/commercial operators. Training included a variety of forums, ranging from informal “tailgate” meetings, to formal classroom training and self-guided training methods. When appropriate, staff training included information about the prevention, detection and investigation of illicit connections and illegal discharges (IC/ID). See **Section 8** for more information regarding IC/ID training.

Performance Standard 4-8

Conduct training for key staff involved in the Business Inspection program			
	<i>Yes</i>	<i>No</i>	<i>N/A</i>
<i>Camarillo</i>	☑		
<i>Ventura County</i>	☑		
<i>Fillmore</i>	☑		
<i>Moorpark</i>	☑		
<i>Ojai</i>	☑		
<i>Oxnard</i>	☑		
<i>Port Hueneme</i>	☑		
<i>Ventura</i>	☑		
<i>Santa Paula</i>	☑		
<i>Simi Valley</i>	☑		
<i>Thousand Oaks</i>	☑		

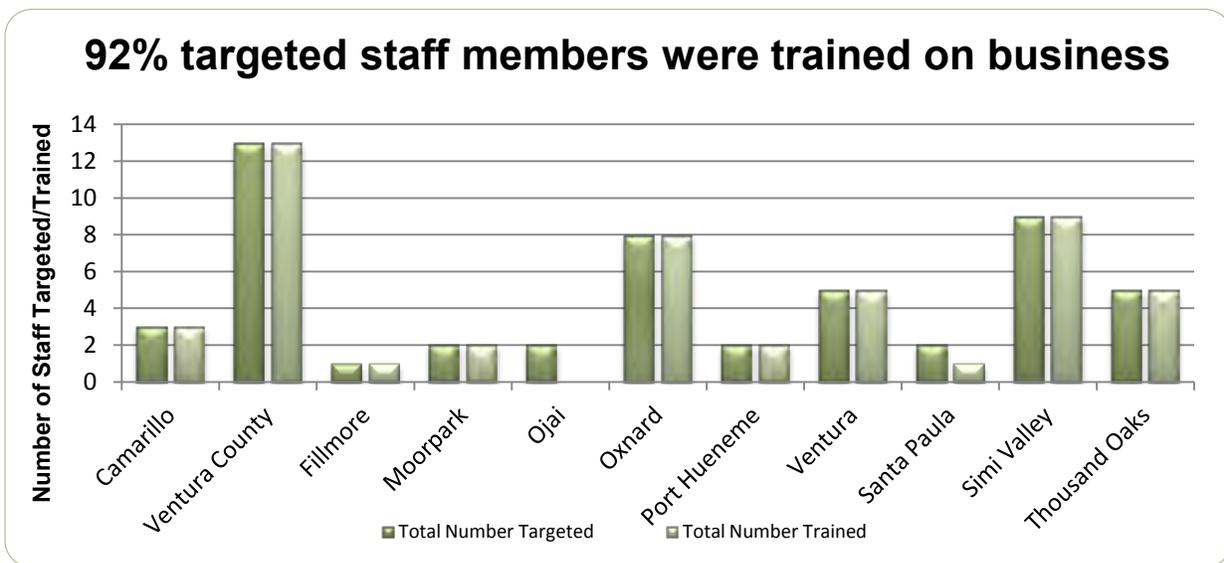
During this reporting period, the Permittees trained 49 inspection staff in stormwater pollution prevention.

Figure 4-14 IC/ID Training depicts the number of staff trained in the program area for each Permittee. Some agencies contract out their inspections to trained consultants and therefore did not target any of their employees.

Table 4-3 Training Areas of Focus for the Industrial/Commercial Program Element

Target Audience	Format	Subject Material	Comments
<ul style="list-style-type: none"> Industrial/Commercial inspectors County Health restaurant inspectors 	<ul style="list-style-type: none"> Classroom Field Demos 	<ul style="list-style-type: none"> Overview of stormwater management program Stormwater ordinance and enforcement policy BMPs for facilities Facility inventory tracking 	<ul style="list-style-type: none"> Training seminars or workshops related to the program may be made available by other organizations

Figure 4-14 IC/ID Training



4.9 EFFECTIVENESS ASSESSMENT – IC6

Effectiveness assessment is a fundamental component required for the development and implementation of a successful stormwater program. In order to determine the effectiveness of the Industrial/Commercial Facility Program Element, a comprehensive assessment of the program data is conducted as part of the Annual Report. The results of this assessment are used to identify modifications that need to be made to the Program Element. Each year the effectiveness assessment is reviewed and revised as necessary.

By conducting these assessments and modifying the Program Element as necessary, the Permittees ensure that the iterative process is used as an effective management tool. Due to the types of data collected for the Industrial/Commercial Facility Program, current and future assessments will primarily focus on Outcome Levels 1 and 2 though behavior changes can be seen as a reduction in discharges is observed and the need for enforcement drops.

- Outcome Level 1 (L1) answers the question: Did the Permittees implement the components of the Permit?
- Outcome Level 2 (L2) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly increased the awareness of its target audience?
- Outcome Level 3 (L3) answers the question: Can the Permittees demonstrate that the control measure/performance standard changed a target audience's behavior, resulting in the implementation of recommended BMPs?

The following is an assessment regarding the effectiveness of the Industrial/ Commercial Program.

4.9.1 Facility Inventory Maintain and Annual Update Inventory

All Permittees maintain an inventory of industrial and commercial facilities. Permittees have begun to inspect facilities with the goal of completing all initial inspections by July 8, 2012 and inspecting facilities twice during the permit term. Initially inspections focused on industrial facilities, auto dealers, auto service shops, laundry facilities, nurseries and restaurants. (L1)

4.9.2 Inspection

Initial inspections were performed by this reporting year. Some Permittees initiated inspections over the 2009-10 reporting periods and continued them through the 2011/12 period to meet this deadline. (L1) Permittees conducted 115 follow-up inspections as needed to ensure compliance. Since the Permit adoption over 5600 inspections were conducted Countywide (L2).

The Permittees have reviewed and revised their inspection checklists, as necessary to be consistent with the permit. (L1)

4.9.3 Industrial/Commercial BMP Implementation

BMP Fact Sheets and Selection

Industrial and commercial BMP Fact Sheets were developed and are available at the Ventura Countywide Stormwater Quality Management Program website. (L1)

Distribute BMP Fact Sheets

Permittees that have initiated an inspections program distribute fact sheets as part of the inspection process. (L1)

4.9.4 Enforcement

Implement Progress Enforcement and Referral Policy

The Permittees have a progressive enforcement and referral policy so that enforcement actions match the severity of a violation and include distinct, progressive steps introduced to bring a facility into compliance. (L1)

Implementation of Industrial Referral Policy

All Permittees may refer industrial business violations to the Regional Water Board provided that Permittees have made a good faith effort of progressive enforcement. (L1)

Investigation of Complaints Transmitted by Regional Water Board

The Permittees implement procedures for responding to complaints forwarded by the Regional Water Board to ensure initiation of inspections within one business day. (L1)

Task Force Participation

The Permittees will participate in an interagency workgroup, such as the Environmental Task Force or the Storm Water Task Force, as a means to communicate information and concerns regarding stormwater enforcement actions undertaken by the Permittees. (L1)

4.9.5 Training

During this reporting period, the Permittees trained 49 staff in business inspections and enforcement. Permittees effectively trained 94% of targeted staff. (L1)

4.9 INDUSTRIAL/COMMERCIAL PROGRAM ELEMENT MODIFICATIONS

On an ongoing basis, the Permittees evaluate the experience that staff has had in implementing the program and the results of the Annual Report to determine if any additional program modifications are necessary to comply with the Clean Water Act requirement to reduce the discharge of pollutants to the MEP.

Many key modifications have been made to the Industrial/Commercial Program Element with the adoption of the new permit. Key modifications that have been made are tracking facilities by watershed, an expanded list of businesses and industries that are tracked and clearly defining how to identify those businesses and industries. Future efforts may look into the inspections or outreach to the owners of multi-tenant commercial retail areas with common trash areas.

5 Planning and Land Development

5.1 OVERVIEW

The addition of impervious areas in the development of homes, industrial and commercial businesses, parking lots, and streets and roads increases the amount of stormwater runoff, as well as the potential for pollution. The Planning and Land Development Program Element ensures that the impacts on stormwater quality from new development and redevelopment are limited through implementation of general site design measures, site-specific source control measures, low impact development strategies, and treatment control measures. The general strategy for development is to avoid, minimize, and mitigate (in that order) the potential adverse impacts to stormwater. The potential for long-term stormwater impacts from development is also controlled by requiring ongoing operation and maintenance of post-construction treatment controls.

The Permittees have developed and implemented a Program for Planning and Land Development to address stormwater quality in the planning and design of development and redevelopment projects. The term “development project” as used in this Program encompasses those projects subject to a planning and permitting review/process by a Permittee. A development project includes any construction, rehabilitation, redevelopment or reconstruction of any public and private residential project, industrial, commercial, retail, and other non-residential projects, including qualifying public agency projects.

To help meet the goals and objectives of the Program, the Permittees attend Planning and Land Development Subcommittee meetings to coordinate and implement a comprehensive and consistent program to mitigate impacts on water quality from development projects to the maximum extent practicable (MEP). However, the Permittees may modify their programs to address particular issues, concerns or unique constraints to a watershed such as local geology or known water quality impairments.

5.2 CONTROL MEASURES

The Permittees have developed several Control Measures and accompanying performance standards to ensure that the planning and land development program requirements are effectively developed and implemented. For each Control Measure there are accompanying performance standards which, once accomplished, constitute compliance with the Permit requirements. The Planning and Land Development Program Control Measures consists of the following:

Table 5-1 Control Measures for the Planning and Land Development Program Element

LD	Control Measure
LD1	State Statute Conformity
LD2	New Development/ Redevelopment Performance Criteria
LD3	Plan Review and Approval Process
LD4	Maintenance Agreement and Transfer
LD5	Tracking, Inspection and Enforcement
LD6	Training
LD7	Effectiveness Assessment

5.3 STATE STATUTE CONFORMITY – LD1

Traditional methods of land development can lead to increased stormwater discharge volumes and flow velocities. These alterations to the natural hydrologic regime may reduce infiltration to groundwater, and increase erosion and flooding and decrease habitat integrity. Water quality and watershed protection principles and policies such as minimization of impervious areas, pollutant source controls, preservation of natural areas, and peak runoff controls can help to minimize the impacts of urban development on the local hydrology and aquatic environment. Integration of stormwater quality and watershed principles into the Permittees' general conditions will serve as the basis for directing future planning and development in order to minimize these adverse effects. In addition, the California Environmental Quality Act (CEQA) process provides for consideration of water quality impacts and appropriate mitigation measures.

5.3.1 Review/Revise CEQA Review Documents

The California Environmental Quality Act (CEQA) sets forth requirements for the processing and environmental review of many projects. The Permittees use the CEQA process and review as an excellent opportunity to address stormwater quality issues related to proposed projects early in the planning stages. The National Environmental Quality Act (NEPA) comes into play less often than CEQA, but may be included on projects involving federal funding. Like CEQA, NEPA process and review provides opportunities to address stormwater quality issues related to proposed projects early in the planning stages.

The CEQA review process is necessary for determining what impacts a proposed development project could have on the environment. The Permittees' current CEQA review process includes procedures for considering potential stormwater quality impacts and providing for appropriate mitigation. Permittees will review and revise the CEQA review documents as needed for consistency with the new Permit.

Each Permittee has reviewed their internal planning procedures for preparing and reviewing CEQA (and NEPA when applicable) documents and has linked stormwater quality mitigation conditions to legal discretionary project approvals. When appropriate, the Permittees consider stormwater quality issues when processing environmental checklists, initial studies, and environmental impact reports. The Permit requires that stormwater controls are incorporated into the Permittees CEQA process by July 8, 2011; the Permittees have been successful in meeting that obligation.

5.3.2 Revise the General Plan

The Permittees' General Plans provide the foundation and the framework for land use planning and development. Therefore, the General Plan is a useful tool to promote the policies for protection of stormwater quality. The Permittees are to include watershed and stormwater management considerations in the appropriate elements of their General Plans whenever these elements are significantly rewritten. Table 5-2 indicates the scheduled date of a significant rewrite to the Permittees' General Plan elements if known. Note that some Permittees have already modified their General Plan to include stormwater requirements under the previous permit, the table reflects if stormwater issues have been incorporated. The Permit additionally requires that when General Plan elements are being updated drafts are provided to the Regional Board for their review. These permit requirements do not have an absolute due date other than as General Plan elements are updated. The 2011 Ventura County General Plan was updated for the 2020 horizon year, and the Housing Element is scheduled for additional updates by October 2013; submittal of the updated Housing Element to Regional Board hasn't been scheduled yet. The Oxnard City

Council adopted the 2030 General Plan on October 11, 2011; this plan is available for review at cityofoxnard.org.

Performance Standard 5-1

CEQA process include the procedures necessary to consider potential stormwater quality impacts			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		



Pervious ribbon gutter in a parking lot

Table 5-2 Scheduled Dates for Permittees' General Plan Rewrite

Land Use	General Plan includes Stormwater Requirements (Y/N)	Scheduled Date for Significant Rewrite of General Plan	Date Submitted to Regional Board
Camarillo	Yes		
County of Ventura	Yes	Completed June 2011	9/1/2010
Fillmore	Yes	1/1/2020	
Moorpark	Yes	7/1/2013	
Ojai	Yes		
Oxnard	Yes	2020	3/12/2009
Port Hueneme	No	1/1/2015	To Be Determined
Ventura	Yes		
Santa Paula	Yes	1/1/2015	12/31/1998
Simi Valley	Yes	8/11/2011	
Thousand Oaks	No		N/A
Housing			
Camarillo	No	7/1/2014	
County of Ventura	Yes	10/1/2013	9/1/2010
Fillmore	Yes	1/1/2013	
Moorpark	No	7/1/2013	
Ojai	Yes		
Oxnard	Yes	2020	3/12/2009
Port Hueneme	No	1/1/2015	To Be Determined
Ventura	Yes		
Santa Paula		1/1/2012	12/31/1998
Simi Valley	Yes	8/11/2011	
Thousand Oaks	No		N/A
Conservation			
Camarillo	No		
County of Ventura	Yes	Updated June 2011	9/1/2010
Fillmore	Yes		
Moorpark	Yes	7/1/2013	
Ojai	Yes		
Oxnard	Yes	2020	3/12/2009
Port Hueneme	Yes	1/1/2015	
Ventura	Yes		
Santa Paula	Yes	1/1/2015	12/31/1998
Simi Valley	Yes	8/11/2011	
Thousand Oaks	Yes	12/31/2012	N/A
Open space			
Camarillo	No		
County of Ventura	Yes	Updated June 2011	Sep-10
Fillmore	Yes		
Moorpark	Yes	7/1/2013	
Ojai	Yes		
Oxnard	Yes	2020	3/12/2009
Port Hueneme	Yes	1/1/2015	
Ventura	Yes		
Santa Paula	Yes	1/1/2015	12/31/1998
Simi Valley	Yes	8/11/2011	
Thousand Oaks	Yes	12/31/2012	N/A

5.4 NEW DEVELOPMENT PERFORMANCE CRITERIA – LD2

Post-construction BMPs, including site design, source control, low impact development techniques, and stormwater quality treatment, are necessary for development and re-development projects to mitigate potential water quality impacts. In addition, priority projects identified within the Permit require specific mitigation measures. In order to assist developers in meeting these requirements, the Permittees developed a Technical Guidance Manual for Stormwater Quality Control Measures for new development and redevelopment in 2002 (TGM 2002). This Manual was updated to conform with the new Permit requirements in 2011 (2011 TGM) these requirements became effective during the reporting period.

5.4.1 Update to the 2002 Ventura County Technical Guidance Manual for Stormwater Quality Control Measures (TGM)

In May 2010 the Permittees updated the 2002 TGM for the selection, design, and maintenance of BMPs for new development and redevelopment projects as identified in Order 2009-0057. This Manual was never approved by the Regional Board Executive Officer due to the permit being remanded and subsequently re-heard by the Board. As an outcome of that hearing new language was adopted for the Permit and a new date set for the revisions to TGM. The TGM was rewritten to address the five-percent effective impervious area requirement, retention and biotreatment, alternative compliance for technical infeasibility, interim hydro-modification requirements, water quality criteria, and maintenance agreements (see also Control Measure LD4 for more information). The 2011 TGM was submitted to the Regional Board on June 16, 2011. The regional approved the 2011 TGM on July 13, 2011 and it became effective on October 11, 2011.



Low Impact Development BMP

5.4.2 Require Compliance with Performance Criteria

New development and redevelopment projects, as outlined in Permit Provision 4.E.II., are subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate stormwater pollution. New performance criteria outlined within the Permit include reducing the percentage of effective impervious area to five-percent or less of the total project area, hydromodification control criteria, and water quality mitigation criteria. These Permit conditions became effective 90 days after the TGM was approved by the Regional Board Executive Officer.

Project Review and Conditioning

For projects whose applications were deemed complete prior to the 2011 TGM effective date the Permittees are to ensure they comply with the previous performance criteria under the Stormwater Quality Urban Impact Mitigation Plan (SQUIMP)

and the 2002 TGM. Under both manuals the Permittees' approach to stormwater comes early in the project development process when the options for pollution control are greatest, and the cost to

incorporate these controls into new development or redevelopment projects is the least. In planning and reviewing a development project, the Permittees consider three key questions with respect to stormwater quality control: 1. what kind of water quality controls are needed? 2. where should controls be implemented? 3. what level of control is appropriate? During the planning and review process, the Permittees identify potential stormwater quality problems, communicate design objectives, and evaluate the plan for the most appropriate design alternatives.

Stormwater Quality Urban Impact Mitigation Plan (SQUIMP)

For those projects deemed complete before October 11, 2011 the Permittees require the implementation of the Stormwater Quality Urban Impact Mitigation Plan (SQUIMP) for new development projects that fall into one or more of the following categories:

- Single-family hillside residences;
- 100,000 square foot commercial development;
- Automotive repair shops;
- Retail gasoline outlets;
- Restaurants;
- Home subdivisions with 10 or more housing units;
- Locations within, or directly adjacent to or discharging to an identified Environmentally Sensitive Area (ESA); or
- Parking lots of 5,000 square feet or more with 25 or more parking spaces and potentially exposed to stormwater runoff.

In addition, redevelopment projects in one of the SQUIMP categories that result in the creation, addition or replacement of 5,000 square feet or more of impervious surfaces, that is not a part of routine maintenance, are subject to SQUIMP requirements. If a redevelopment project creates or adds 50% or more impervious surface area to the existing impervious surfaces, then stormwater runoff from the entire area (existing and redeveloped) must be conditioned for stormwater quality mitigation. Otherwise, only the affected area of the redevelopment project requires mitigation.

The SQUIMP lists the minimum required BMPs that must be implemented for new development and redevelopment projects subject to the SQUIMP. The minimum requirements include the following BMPs:

- Control peak stormwater runoff discharge rates
- Conserve natural areas
- Minimize stormwater pollutants of concern
- Protect slopes and channels
- Provide storm drain stenciling and signage
- Properly design outdoor material storage areas
- Properly design trash storage areas
- Provide proof of ongoing BMP maintenance
- Meet design standards for structural or treatment control BMPs
- Comply with specific provisions applicable to individual priority project categories, which include the following: 100,000 square foot commercial development; restaurants; retail gasoline outlets; automotive repair shops; and parking lots.

Performance Standard 5-2

Require compliance with performance criteria under SQUIMP			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

5.4.3 BMP Selection and Design Criteria

The Permittees consider site-specific conditions of development projects and pollutants of concern on the watershed when determining which BMPs are most appropriate for a site. Prior to approving BMPs, the staff conditioning the project evaluates post-construction activities and potential sources of stormwater pollutants. The project proponent is required to consider BMPs that would address the potential pollutants reasonably expected to be present at the site once occupied. BMPs to protect stormwater during the construction phase may also be a part of this conditioning process, although these are addressed through the grading permit process through the Construction Program



Low Impact Development BMP

In order to achieve appropriate stormwater quality controls, the Permittees use the following common criteria in screening and selecting, or rejecting BMPs during the planning stage with a priority given to non-proprietary designed BMPs:

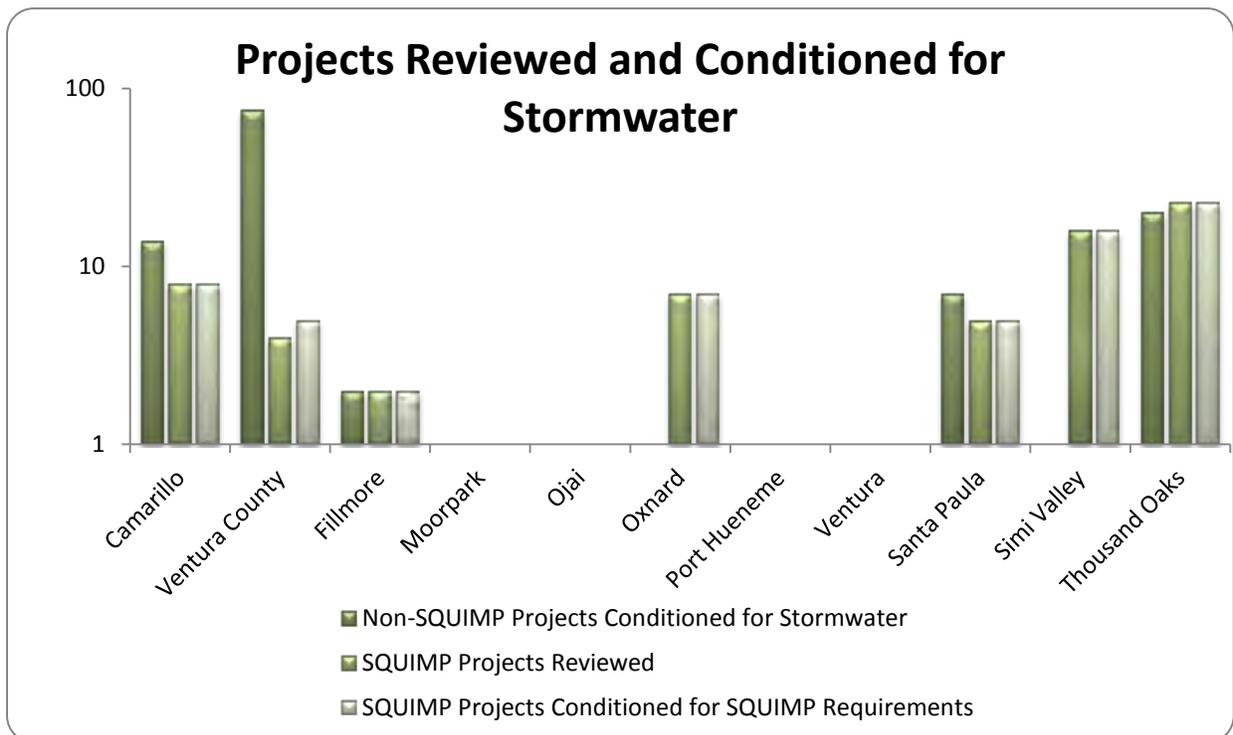
- Project characteristics;
- Site factors (e.g., slope, high water table, soils, etc.);

- Pollutant removal capability;
- Short term and long term costs;
- Responsibility for maintenance;
- Contributing watershed area; and
- Environmental impact and enhancement.

The BMP selection criteria listed above is applied by the Permittees in accordance with the overall objective of the Planning and Land Development Program, i.e. to reduce pollutants in discharges to the MEP. In some site-specific situations there will be BMPs clearly be more appropriate and effective than others, the BMP selection process reflects this variability.

The number of projects required to comply with the performance criteria during the permit year is outlined in Figure 5-1. This includes projects required by the Permit to implement stormwater treatment controls, but beyond that projects that due to their nature or potential to discharge pollutants of concern, were also required to implement stormwater management controls of either source control or water quality treatment.

Figure 5-1 Projects Reviewed and Conditioned



5.4.1 Potential of Offsite Mitigation Projects

The new requirements of the Permit allow an alternative to compliance with the land development criteria of onsite retention and biotreatment for projects with technical infeasibilities through the use of offsite mitigation. New developments and significant re-developments that have identified technical infeasibilities, and therefore cannot comply with the retention and biofiltration requirements onsite have the option of utilizing alternative mitigation offsite.

The Permittees are in the process of developing an offsite mitigation framework and identifying potential locations. Infill and redevelopment projects that demonstrate technical infeasibility may be eligible for offsite mitigation. As required by the Permit, Permittees will provide a list of offsite opportunities and track and summarize offsite mitigation projects.

The Permittees researched potential management and funding structures for creating a new offsite stormwater alternative mitigation program as identified in the Permit. The project focused on general funding mechanisms, accounting, and the program management structure needed to implement and sustain a long term stormwater retention and/or biofiltration program. The second prong of the project focused on potential locations for the offsite program using an integrated water resources approach. The first step was to determine the potential need for offsite mitigation to understand the scale of projects that may be needed.

Because development projects are required to manage as much water on site as possible the final results of the projected needs assessment yielded a volume of only eight acre feet countywide would need to be managed offsite by 2030. This volume of water is not a significant amount and did not attract the potential for integrated water resource management programs with third party partners (e.g. local water agencies) to support the development of offsite BMPs. From these studies the Permittees learned that the offsite need for any one project is likely to be small enough to be manageable in the public right-of-way of the permitting agency and maintained through conventional funding mechanisms.

5.4.2 Require Hydromodification Criteria

Permittees currently require the interim hydromodification criteria as specified in Permit provision 4.E.III.3(a)(3). Interim criteria will be required until the Southern California Water Monitoring Coalition (SMC) completes the Hydromodification Control Study (HCS).

The purpose of Hydromodification Control Measures is to minimize impacts to natural creeks due to changes in postdevelopment stormwater runoff discharge rates, velocities, and durations by maintaining, within a certain tolerance, the project's pre-project stormwater runoff flow rates and durations.

Hydromodification Control Measures may include onsite, subregional, or regional Hydromodification Control Measures; Retention BMPs; or stream restoration measures. Preference will likely be given to onsite Retention BMPs and Hydromodification Control Measures; however in-stream restoration measures may be determined to be the best use of resources and may more effectively and quickly address the beneficial uses of natural drainage systems.

The Southern California Stormwater Monitoring Coalition (SMC) is developing a regional methodology to eliminate or mitigate the adverse impacts of hydromodification as a result of urbanization, including

hydromodification assessment and management tools. The Program will develop and implement watershed specific Hydromodification Control Plans (HCPs) after the completion of the SMC study (Permit requires HCP is submitted 180 days after the completion of the SMC study). Until the completion of the HCPs, the Interim Hydromodification Control Criteria, described below, apply to applicable, non-exempt new development and redevelopment projects.

Performance Standard 5-3

Participate in the Stormwater Monitoring Committee's Hydromodification Control Study			
	Yes	No	N/A
Ventura Countywide Stormwater Quality Program	<input checked="" type="checkbox"/>		

Performance Standard 5-4

Develop and implement watershed specific HCPs? (180 days after the completion of the SMC HCS)			
	Yes	No	In Progress
Ventura Countywide Stormwater Quality Program			<input checked="" type="checkbox"/>

The Permit states that “Permittees may exempt projects from implementation of hydromodification controls where assessments of downstream channel conditions and proposed discharge hydrology indicate that adverse Hydromodification effects to present and future beneficial uses of Natural Drainage Systems are unlikely: Projects that discharge directly or via a storm drain into concrete or improved (not natural) channels (e.g., rip rap, sackcrete, etc.)” Because of the emphasis on natural drainage systems, defined by the permit as “not engineered” the Permittees have undertaken a mapping exercise to identify all the improved, or engineered, rivers and channels where the Permit identified hydromodification exemptions apply. This map can then be used to identify the rivers and channels where hydromodification will need to be considered by new and redevelopment.

5.4.3 Interim Hydromodification Control Criteria

Interim hydromodification controls for projects deemed complete after the effective date which disturb less than 50 acres shall be complying with the stormwater management standards contained in the 2011 TGM.

Projects disturbing 50 acres or greater must develop and implement a Hydromodification Analysis Study (HAS) that demonstrates that post development conditions are expected to approximate the pre-project erosive effect of sediment transporting flows in receiving waters. The HAS must lead to the incorporation of project design features intended to approximate, to the extent feasible, an Erosion Potential value of 1, or any alternative value that can be shown to be protective of the natural drainage systems from erosion,

incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat in natural drainage systems.

5.5 PLAN REVIEW AND APPROVAL PROCESS

Stormwater quality controls should be considered throughout the development plan review and approval process. Comprehensive review by the Permittees of development plans must be provided in order to ensure that stormwater controls minimize stormwater quality impacts.

5.5.1 Conduct BMP Review

Permittees conducted a detailed review of site designs and the proposed BMPs. Review included matching BMPs to the pollutants of concern, sizing calculations, pollutant removal performance and municipal approval. Project designs are not approved unless all conditions have been met.

Performance Standard 5-5

Conducted a detailed review of proposed BMPs. Review included sizing calculations and pollutant removal performance			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

318 rain barrels were sold this year through the Program's co-operative effort with the County's Integrated Waste Management Division, over 1400 sold since Permit adoption.

5.5.2 Establish Authority among Municipal Departments with Project Review Jurisdiction

Permittees have an established structure for communication and delineated authority between municipal departments that have jurisdiction over project review, plan approval, and project construction. Each Permittee has approached this in the manner that will be most effective within their organization. Interdepartmental communication and coordination does not represent a complicated hurdle for the smaller agencies, however, larger agencies such as the County of Ventura have formally drafted Memorandums of Understanding to establish the structure and define responsibilities.

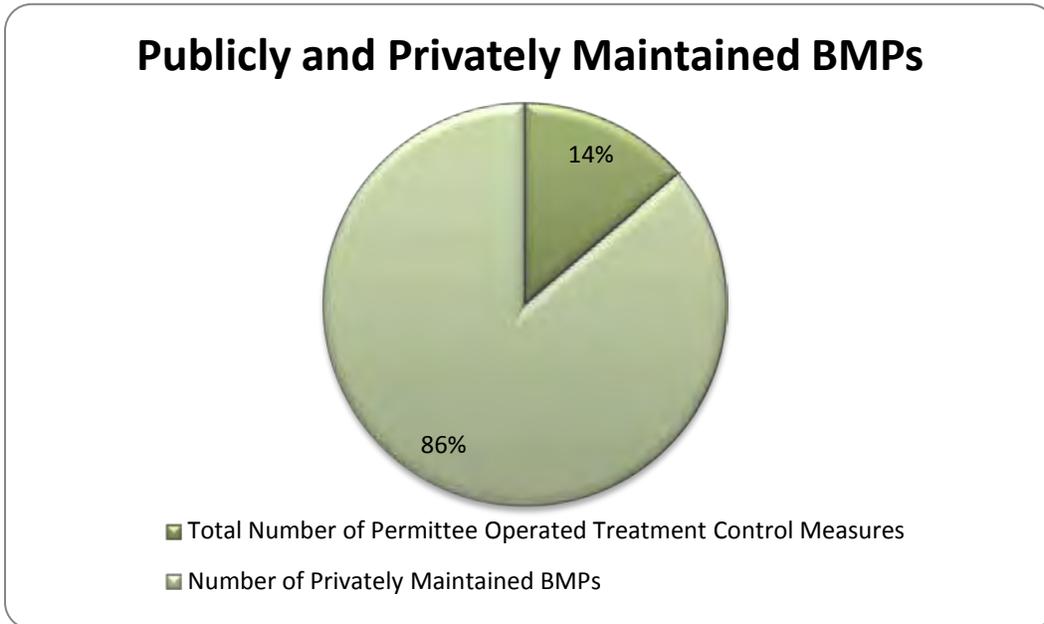
Performance Standard 5-6

Established authority among municipal departments with project review jurisdiction control BMPs. (by July 8, 2011)			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

5.6 TRACKING, INSPECTION AND ENFORCEMENT – LD4

Permittees have implemented a tracking systems and an inspection and enforcement program for new development and redevelopment post-construction stormwater BMPs.

Figure 5-2 Publicly and Privately Maintained BMPs



5.6.1 **Develop/Implement a Tracking System for Post-Construction Treatment Control BMPs**

Permittees have been conditioning development projects for stormwater controls since the 2002 TGM and understand that maintenance of these BMPs is instrumental to their performance of improving water quality. Developing and implementing a system for tracking projects that have been conditioned for post-construction treatment control BMPs is necessary to ensure that BMPs are properly maintained and working. The Permit requires this tracking system be in place by July 8, 2011.

Each Permittees' electronic system should contain the following information:

1. Municipal Project ID
2. State WDID No.(IAGSP)
3. Project Acreage
4. BMP Type and Description
5. BMP Location (coordinates)
6. Date of Acceptance
7. Date of Maintenance Agreement
8. Maintenance Records
9. Inspection Date and Summary
10. Corrective Action
11. Date Certificate of Occupancy Issued
12. Replacement or Repair Date

5.6.2 **Conduct Inspections of Completed Projects**

Beginning July 8, 2011 the Permittees are required to conduct inspections of completed projects subject to the Planning and Land Development Program requirements to ensure proper installation of all approved control measures have been implemented and are being maintained. Identifying and tracking these projects will follow the development permitting process. The Certificate of Occupancy is withheld until a project can show that BMPs have been installed as designed on approved plans. See Attachment B for an example inspection checklist from the City of Camarillo.

Performance Standard 5-7

Develop and implement a system for tracking projects that have been conditioned for post-construction treatment control BMPs? (by July 8, 2012)			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark			<input checked="" type="checkbox"/>
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley			<input checked="" type="checkbox"/>
Thousand Oaks	<input checked="" type="checkbox"/>		

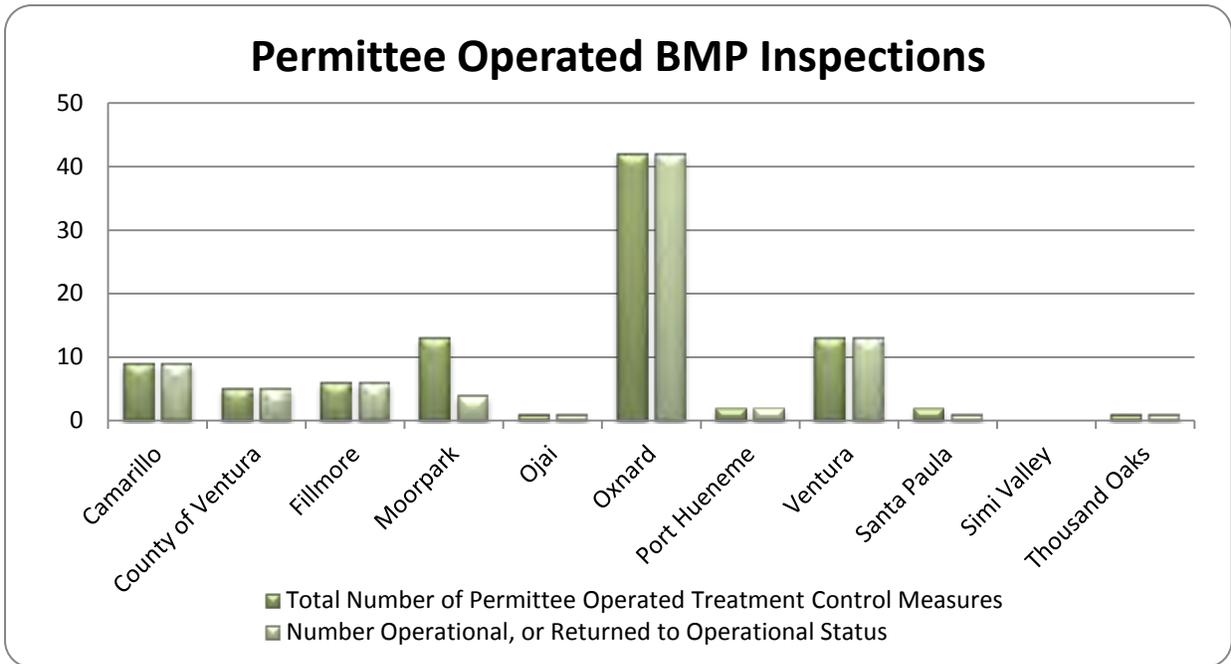
Performance Standard 5-8

Conduct inspections of completed projects subject to the Planning and Land Development Program requirements to ensure proper installation of BMPs (effective 90 days after approval of Manual)			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

5.6.3 Conduct Inspections of Permittee Owned BMPs

The Permittees are responsible for the inspection and maintenance of BMPs they own and operate. Sometimes Permittees will accept this responsibility from a development as a way to ensure that proper maintenance is performed. Not all Permittees own and operate BMPs, and some have not yet installed or accepted ownership of permanent BMPs. These inspections are required once every two years. The first inspection was due July 8, 2012, which is outside the reporting period of this report.

Figure 5-3 Permittee Operated BMPs



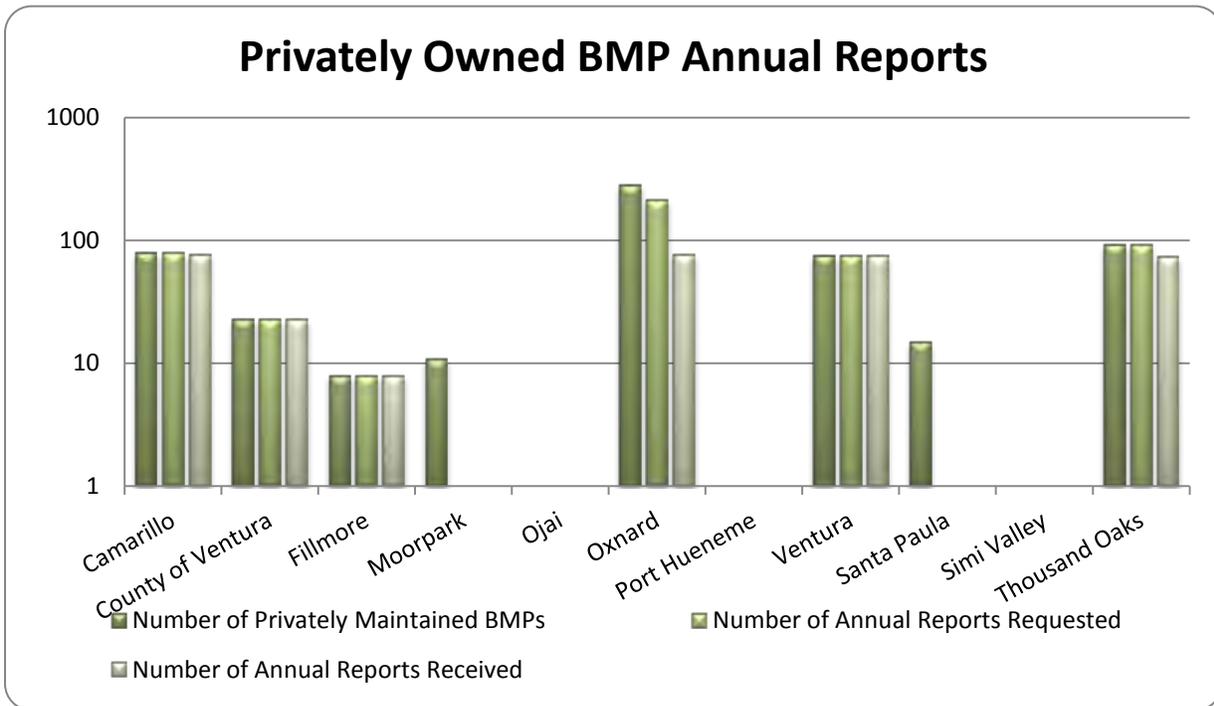
Performance Standard 5-9

Inspect post-construction BMPs operated by the Permittees at least once every 2 years				
	Yes	No	N/A	In Progress
Camarillo	<input checked="" type="checkbox"/>			
Ventura County				<input checked="" type="checkbox"/>
Fillmore	<input checked="" type="checkbox"/>			
Moorpark	<input checked="" type="checkbox"/>			
Ojai	<input checked="" type="checkbox"/>			
Oxnard	<input checked="" type="checkbox"/>			
Port Hueneme			<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>			
Santa Paula	<input checked="" type="checkbox"/>			
Simi Valley			<input checked="" type="checkbox"/>	
Thousand Oaks	<input checked="" type="checkbox"/>			

5.6.4 Require Annual Reports for Post-Construction BMPs

In July of 2011 the Permittees were required to require the submittal of Annual Reports for BMPs maintained by parties other than the Permittees. The annual reports are to provide information to the Permittees showing that the BMPs have been properly maintained. In many cases a copy of an invoice from a service provider showing the date maintenance performed will suffice for an annual report.

Figure 5-4 BMP Annual Reports



Performance Standard 5-10

Require annual reports for private post-construction BMPs to demonstrate proper maintenance and operations			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

5.7 Take Enforcement Action

Inspections and the requirement for annual reports are only the first steps towards ensuring BMPs are operational. Enforcement actions based on the results of the inspection may be needed in order to bring the facility into compliance. The Permit requires inspections of Permittee owned BMPs and enforcement is not necessary in that scenario. To ease future compliance the Permittees are performing educational outreach to the owner/operators of BMPs.

A performance standard on enforcement may be developed in future reports, however, enforcement would only be needed when there is non-compliance. Low enforcement numbers (high level of compliance) may represent an effective program just as well as high enforcement numbers would represent a determined effort to return BMPs to compliance.

5.8 MAINTENANCE AGREEMENT AND TRANSFER – LD5

Maintenance agreement and transfers ensure that post-construction BMPs will remain effective upon project completion and continued occupancy. As a condition of approval for all priority development projects, Permittees require the owner/ developer/successor-in-interest of stormwater BMPs to provide proof of control measure maintenance in the form of a Stormwater Treatment Device Operation and Maintenance Agreement and a Maintenance Plan.

5.8.1 **Require Stormwater Treatment Device Operation and Maintenance Agreement**

Permittees integrated the development/submittal of a stormwater maintenance agreement as a condition within the project approval process for projects subject to the Permit's Planning and Land Development Program requirements. To enforce the requirements of post-construction BMPs, a Maintenance Agreement is required to be executed between the Permittee and the owner/developer/successor-in-interest for any private facilities who remain the responsible party in operating and maintaining the post-construction Treatment Control Measures.

The 2002 TGM and the 2011 TGM revisions address the development and submittal of Maintenance Agreements when a developer is responsible for ongoing maintenance of onsite treatment BMPs.



Low Impact Development infiltration BMP

Performance Standard 5-11

Require an operation and maintenance plan for applicable stormwater BMPs			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

5.9 TRAINING – LD6

Training is important to the successful implementation of the Planning and Land Development Program Element. An effective training program is one of the best pollution prevention BMPs that can be implemented because this subject is complicated and requires many interpretations and judgment calls.

To facilitate the implementation of the new Technical Guidance Manual a special training session was held in June of 2011. This training was open to private sector developers as well as the planners and plan check engineers who will be interpreting and implementing the new standards. It was important to have everybody in the same room receiving the same training to minimize confusion and conflict at the counter when actual projects will be coming in for approval. This six-hour training was attended by well over one hundred people.

Figure 5-5 Land Development Training

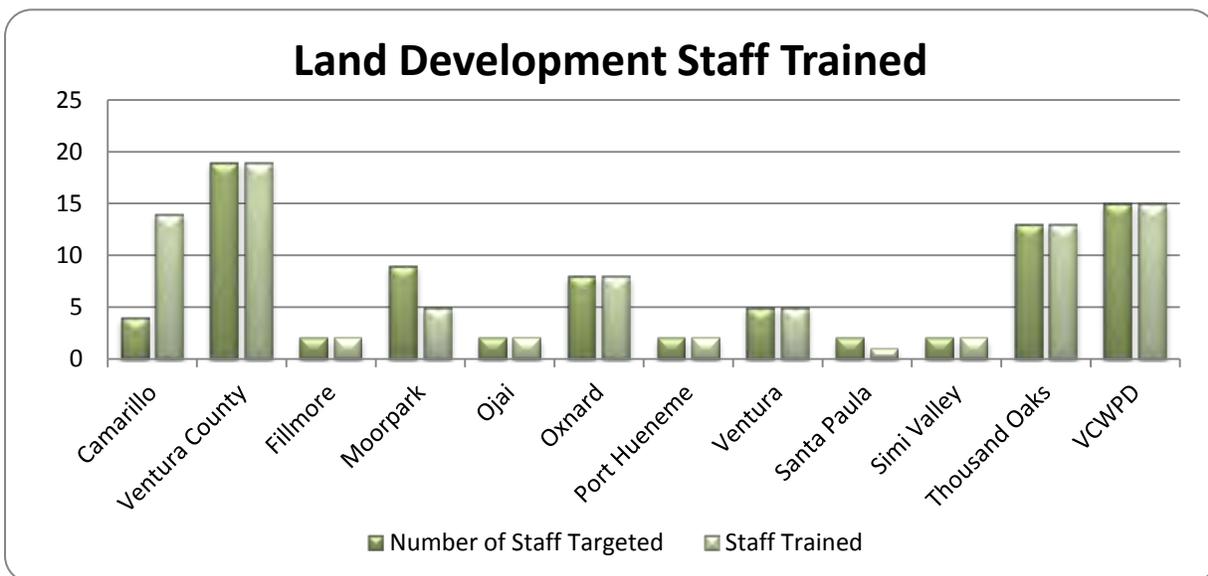


Table 5-3 Training Areas of Focus for the Planning and Land Development Program Element

Target Audience	Format	Subject Material
<ul style="list-style-type: none"> • Plan Checkers • Engineers • Building and Construction Inspectors • Builders • Design Professionals • Regulators • Resource Agencies • Other Stakeholders 	<ul style="list-style-type: none"> • Classroom 	<ul style="list-style-type: none"> • Overview of 2011 TGM • Integration of LID at various project scales • Guidance on relationship between LID strategies, source control BMPs, and hydromodification control requirements • Highlight LID pilot projects and demonstration projects

5.10 EFFECTIVENESS ASSESSMENT – LD7

Effectiveness assessment is a fundamental component for developing and implementing successful stormwater programs. In order to determine the effectiveness of the Planning and Land Development Program, a comprehensive assessment of the program data is conducted as a part of the annual report. The results of this assessment are used to identify modifications that need to be made to the program. Each year the effectiveness assessment is reviewed and revised as needed.

By conducting these assessments and modifying the program as needed, the Permittees ensure that the iterative process is used as an effective management tool. Due to the types of data collected for the Planning and Land Development Program, current and future assessments will primarily focus on Outcome Levels 1, 2 & 3.

- Outcome Level 1 (L1) answers the question: Did the Permittees implement the components of the Permit?
- Outcome Level 2 (L2) answers the question: Can the Permittees demonstrate that the control measure/performance standard increased awareness of a target audience?
- Outcome Level 3 (L3) answers the question: Can the Permittees demonstrate that the control measure/performance standard changed a target audience’s behavior, resulting in the implementation of recommended BMPs?

The following is an assessment regarding the effectiveness of the Planning and Land Development Program.

5.10.1 State Statute Conformity

Review/Revise CEQA Review Documents

The CEQA process and plan review process is an effective mechanism for addressing stormwater quality issues early in the planning stages. Where applicable, all Permittees have reviewed their internal planning procedures for preparing and reviewing CEQA documents. All Permittees have formally integrated stormwater quality issues into the CEQA review process (**L1**).

Revise the General Plan

The majority of Permittees have either already incorporated or are in the process of incorporating stormwater requirements into their General Plans (**L1**). This control measure is dependent on the scheduled updates/amendments to General Plans which varies greatly by municipality. Once updated,

Permittees will submit draft elements to the Regional Board for review. Effectiveness of this control measure will continue to be evaluated as progress is made.

5.10.2 **New Development Performance Criteria**

Update the 2002 Ventura County TGM

The 2002 Ventura County TGM was updated and submitted to the Regional Board on June 16, 2011 (L1). The updated TGM (2011 TGM) includes:

- Interim hydromodification criteria (addressed in Section 2);
- Expected BMP pollutant removal performance (addressed in Section 3 and Appendix D);
- Improved correlation of BMPs with stormwater POCs (addressed in Section 3 and Appendix D);
- BMP maintenance and cost considerations (addressed in Section 7, Appendices H & I);
- Integration of integrated water resources planning and management goals (Sections 1 and 4).

Require Compliance with Performance Criteria

Permittees continued to require compliance with 2002 TGM for all SQUIMP new development and redevelopment project categories (L1). As indicated in Figure 5-1, Permittees reviewed 465 projects and required 66 projects to implement source control and/or water quality treatment (note these numbers apply to both SQUIMP and non-SQUIMP project categories) (L2). The 2011 TGM became effective October 11, 2011, 90 days after its approval by the Regional Board Executive Officer. With the 2011 TGM in effect, priority new development and redevelopment project will be required to comply with the 5% EIA Requirement and other new development provisions contained within Order No. R4-2010-0108.

Documentation of Offsite Mitigation Projects

The Permittees are in the process of developing an offsite mitigation framework and creating a list of potential locations.

Require Hydromodification Criteria

The Permittees currently require SQUIMP project categories to comply with the interim hydromodification criteria (L1). The Ventura Countywide Stormwater Quality Program continues to participate in the SMC's hydromodification control study (L1). Permittees will implement watershed-specific HCP's once the hydromodification control study is complete.

5.10.3 **Plan Review and Approval Process**

Conduct BMP Review

Proposed post-construction BMPs were reviewed by each of the Permittees. BMP review included calculation sizing and pollutant removal performance. Permittees have effectively conducted BMP review for several years now and current review mechanisms are considered adequate (L1).

Establish Authority among Municipal Departments

Each Permittee has successfully established the authority for review of stormwater quality measures. The mechanism varies by Permittee and for the larger Permittees may consist of a formal MOU (L1).

5.10.4 Tracking, Inspection and Enforcement

Develop/Implement Tracking Mechanism

Permittees have been conditioning development projects for stormwater controls since the last permit and understand that maintenance of these BMPs is instrumental to their performance of improving water quality. Developing and implementing a system for tracking projects that have been conditioned for post-construction treatment control BMPs is necessary to ensure that BMPs are properly maintained and working. (L1)

Conduct Inspections of Completed Projects

This performance measure was due July 8, 2011 and all 11 Permittees have conducted inspections of completed projects to ensure they were done in accordance with the land development requirements, or do not have completed projects and are in the process of developing their inspections programs (L1) (L2).

Conduct Inspections of Permittee Owned BMPs

Eight of the Permittees are already inspecting the BMPs they own and operate, while others have not built or adopted BMPs. (L1)

Take Enforcement Action

Four of the Permittees have needed to take enforcement action to ensure proper BMP maintenance - five others reported that enforcement actions were not necessary to achieve compliance. This performance measure is reliant on the implementation of an inspection program which was not required to be fully implemented during this reporting period. (L2)

5.10.5 Maintenance Agreement and Transfer

Require Stormwater Treatment Device Access and Maintenance Agreement

Permittees have required since 2002 and will continue to require a maintenance agreement to ensure proper maintenance and permission to enter property and access BMPs (L1).

Require Annual Reports for Post-Construction BMPs

All Permittees reported that they have required annual reports or are in the process of generating the reporting procedures with the intention of having it operational by the July 2012 due date (outside of this reporting period).

5.10.6 Training

Conduct Training

During this reporting period, Permittees trained 88 staff. Training primarily focused on updates to the 2011 TGM (L1).

5.11 PLANNING AND LAND DEVELOPMENT PROGRAM MODIFICATIONS

On an annual basis, the Permittees plan to evaluate the results of the Annual Report, as well as the experience that staff has had in implementing the program, to determine if any additional program

modifications are necessary to comply with the Clean Water Act requirement to reduce the discharge of pollutants to the MEP. Any key modifications made to the Land Development Program Element during the next fiscal year will be reported in the following Annual Report, such as the implementation of the new requirements that became effective during the 2011/12 Permit year.

6 Development Construction

6.1 OVERVIEW

During construction projects, a number of activities have the potential to generate or mobilize pollutants. The purpose of the Development Construction Program Element is to coordinate programs and resources to effectively reduce pollutants in runoff from construction sites during all construction phases.

Reducing pollutants from construction activities has been a focus of the Permittees' compliance program since the stormwater program's inception. The Permittees regulate private construction activities, and also have responsibility for the construction and renovation of municipal facilities and infrastructure (these projects are reported in Section 7 Public Agency Activities). Major components of the Permittee's Construction Program include:

- Review of local SWPPPs for compliance with local codes, ordinances, and permits;
- Inspection of all construction sites for the implementation of stormwater quality controls a minimum of once during the wet season. Follow-up inspections take place within two weeks for sites found to have not adequately implemented their Local SWPPP;
- Require proof of filing a Notice of Intent (NOI) for coverage under the State General Construction Permit prior to issuing a grading permit for all projects requiring coverage.

Additionally, the Construction Program provides construction site owners, developers, contractors, and other responsible parties information on the requirements and guidelines for pollution prevention/BMP methods. To ensure construction sites are implementing the SWPPPs properly, each jurisdiction conducts inspections during the rainy season to verify the appropriateness and implementation of BMPs, taking enforcement action as necessary. Inspectors are also visiting the sites in the dry season to ensure the potential for illicit discharges has been reduced. Training and outreach is done regularly to improve the quality and consistency of program implementation throughout Ventura County.

The Permittees attend the Construction Subcommittee meetings to coordinate and implement a comprehensive program to mitigate impacts on water quality from construction sites to the maximum extent practicable (MEP). In order to facilitate effective inspections and to document compliance with this requirement the Construction Subcommittee developed a model Stormwater Quality Checklist for Permittee use, which can be found in Attachment C. The checklist and the meetings create countywide consistency in the programs, however, the Permittees usually modify their programs to address particular issues, concerns, or constraints that are unique to a particular watershed or to an individual municipality. The Subcommittee is attended by representatives of the Permittee's cities and other municipal staff from various departments including Engineering Services, Planning and Land Development, and Inspection Services.

6.2 CONTROL MEASURES

The Permittees have developed several Control Measures and accompanying performance standards to provide information for optimizing the program and ensure that the construction-related requirements in the Permit are met. For each Control Measure there are accompanying performance standards which, once accomplished, constitute compliance with the Permit.

The Development Construction Program Control Measures consist of the following:

DC	Control Measure
DC1	Plan Review and Approval Process
DC2	Inventory
DC3	Inspections and BMP Implementation
DC4	Enforcement
DC5	Training
DC6	Effectiveness Assessment

Table 6-1 Control Measures for the Development Construction Program Element

At the end of this chapter these control measures are evaluated to determine the effectiveness of this program element.

6.3 PLAN REVIEW AND APPROVAL PROCESS – DC1

The Plan Review and Approval Process control measure provides the Permittees with the mechanism to review and approve construction plans which address sediment and erosion controls. Effective planning of construction site activities leads to minimizing erosion and preventing pollutants from entering the storm drain system. The Permittees require all projects that disturb less than one acre of land to address pollutants and activities during the construction phase of the project by implementing the erosion control, sediment control, non-stormwater management, and waste management BMPs identified in the NPDES Permit. For larger projects greater than one acre, and less than five acres, the list of required BMPs gets progressively larger, more complex, and more protective. Prior to issuing a grading permit, the Permittees review construction and grading drawings to ensure that necessary erosion and sediment control BMPs and source and treatment control BMPs are identified and properly designed to control runoff pollution to the MEP. In the case of construction that encroaches in the Watershed Protection District's right-of-way, those projects are inspected but are invariably part of larger project and the lead agency for that project is the jurisdiction with land use authority permitting the design and building of that larger project.

6.3.1 Review Grading and Construction Permit Applications for SWPPP Requirements

Prior to approving a grading permit, the Permittees require a SWPPP be submitted for projects greater than one acre. Additionally, as is mandatory for all construction related activity disturbing one or more acres, Permittees require proof of filing an NOI for projects subject to the General Construction Permit. The SWPPP remains in effect until the construction site is stabilized and all construction activity is completed. The SWPPP includes identification of potential pollutant sources and the design, placement and maintenance of BMPs to effectively prevent the entry of pollutants from the construction site to the storm drain system. In addition, the Permittees require construction projects to include the following requirements:

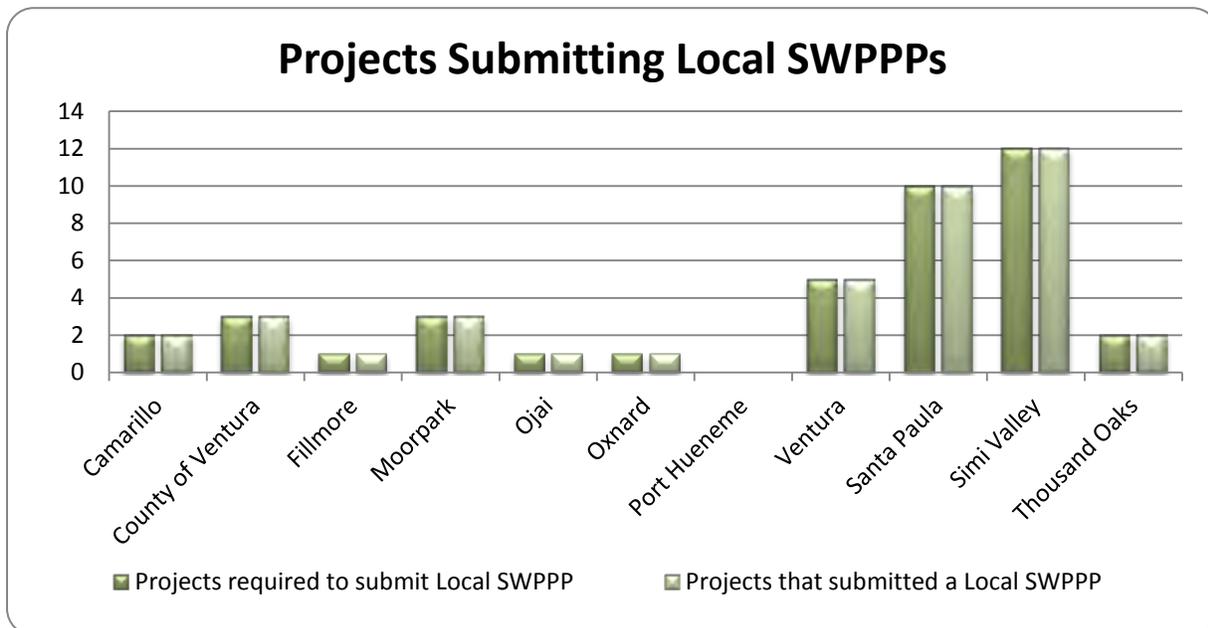
- Erosion from slopes and channels will be eliminated by implementing BMPs, including but not limited to, inspecting graded areas during rain events, planting and maintaining vegetation on slopes and covering erosion susceptible slopes;
- Sediments generated on the project site shall be retained using structural drainage controls;

- No construction-related materials, wastes, spills or residues shall be discharged from the project site to streets, drainage facilities or adjacent properties by wind or runoff;
- Non-stormwater runoff from equipment and vehicle washing and any other activity shall be contained at the project site;

The Permittees have also incorporated SWPPP provisions in their own construction projects resulting in soil disturbance of one acre or more, located in hillside areas, or directly discharging to an ESA. The Permittees include provisions delineating contractor responsibilities for SWPPP preparation, implementation and for performance of the work and ancillary activities in accordance with the SWPPP approved by the Permittee for the project. In some jurisdictions, Local SWPPPs were required and submitted for nearly all projects including those not exceeding Permit thresholds. This conservative approach underlines the importance the Permittees place on ensuring implementation of stormwater controls at construction sites.

This figure reflects the number of grading permits issued during this reporting period and does not necessarily reflect the number of active construction projects. This is due to the fact that some larger projects may take longer than a year to complete. Conversely, not all projects that received grading permits granted during the permit year actually began grading and construction. Because of these facts the number of active projects requiring inspection does not always match the number of grading permits granted. A project may be operating under a grading permit granted the previous year, or the grading permits may have been granted after the wet season so there was no opportunity for a wet season inspection, so the number of permits and projects inspected rarely match.

Figure 6-1 Local SWPPPs



6.3.2 Requirements for Projects Subject to the General Stormwater Permit

The Permittees require all construction projects subject to the General Stormwater Permit for Construction Activities to submit proof of filing a NOI prior to issuing a grading permit. Proof of filing a

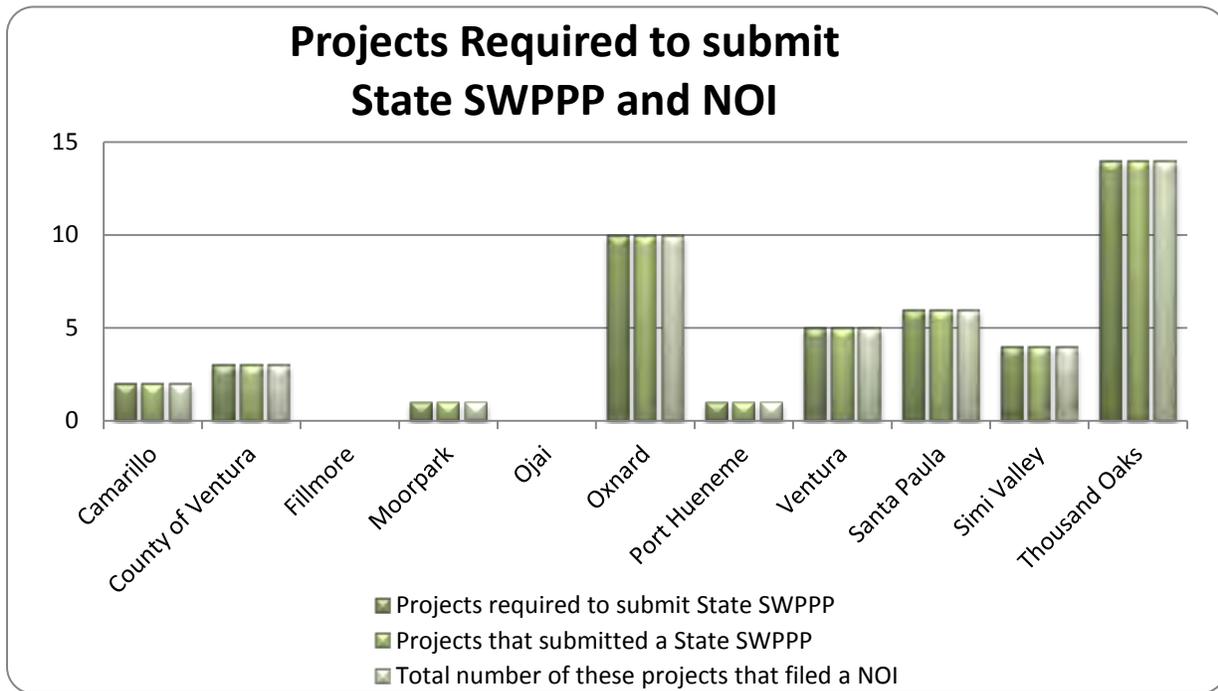
NOI can include a copy of the completed NOI form and a copy of the check sent to the State Water Resources Control Board (SWRCB), or a copy of the letter from the SWRCB with the Waste Discharge Identification Number (WDID) for the project.

Permittees inspect more construction sites than are required to submit a SWPPP, and inspect them more frequently for stormwater compliance than the permit requires.

In addition, the Permittees will file NOIs with the SWRCB and pay the appropriate fees when Permittee construction projects require coverage under the General Construction Permit. The NOIs and appropriate fees are sent to the State prior to the commencement of any construction activity covered by the General Construction Permit. A copy of the NOI is kept with the project files and in the SWPPP for the project.

Projects subject to the requirements of the General Construction Permit currently include those involving clearing, grading, or excavation resulting in soil disturbances of at least one acre. Permittee emergency work and routine maintenance projects do not require preparation of a SWPPP. That does not imply that stormwater controls are not implemented during these activities. Routine maintenance and emergency projects are performed in accordance with the Permit’s requirements for Public Agency Activities.

Figure 6-2 State SWPPPs and NOIs



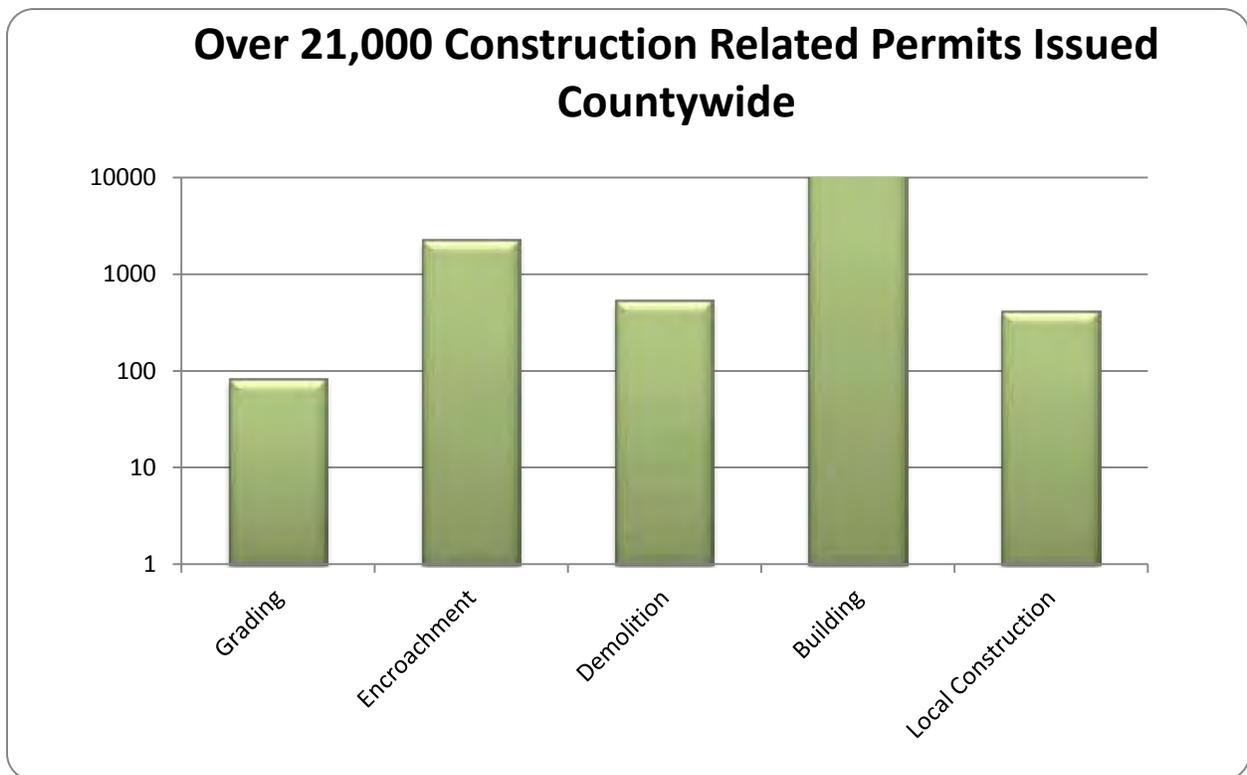
6.4 INVENTORY – DC2

The Construction Projects Inventory Control Measure involves tracking construction sites from the planning stage to completion. This is essential for ensuring that stormwater pollutants are reduced to the MEP. Maintaining a database to track all stages of the construction process is the foundation of

construction-related source identification and helps to ensure that pollution prevention and source control are emphasized during all phases of the construction project. The permitting process is also an opportunity to provide stormwater education and outreach to the construction community and to emphasize the penalties that can be incurred with non-compliance.

The Permittees have programs in place to track all grading, encroachment, demolition, and building permits as required by the NPDES Permit. In order to ensure the appropriate BMPs are being implemented when soil disturbing activities are taking place, the Permittees focus on the grading permit process to identify projects and the level of BMPs required. This has been determined as the most effective way to track projects with a potential to impact water quality as many encroachment, building, and other permits that are not associated with grading activities do not present the same level of risk to stormwater quality.

Figure 6-3 Construction Permits Issued



Performance Standard 6-1

Maintain an electronic system to track grading permits, encroachment permits, and any other municipal authorization to move soil			
	Yes	In Progress	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore			
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula			
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 6-2

Required proof of Change of Information form (COI) and a copy of the modified SWPPP(s) at any time a transfer of ownership takes place			
	Yes	No	N/A
Camarillo			<input checked="" type="checkbox"/>
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark			<input checked="" type="checkbox"/>
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura			<input checked="" type="checkbox"/>
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection			<input checked="" type="checkbox"/>

6.5 INSPECTIONS AND BMP IMPLEMENTATION – DC3

The Inspection and BMP Implementation Control Measure is critical to the ultimate success of the Development Construction Program Element. An effective construction site inspection program requires having adequate legal authority to enforce Permittee requirements, tracking active construction sites to identify repeat violators, and conducting inspections to ensure the sources are identified and that BMPs are being implemented and maintained. The inspection program also provides the basis for notifying the Regional Water Board when inspectors identify non-compliant sites including non-filers or repeat violators.

Figure 6-4 Site Inspections and Follow-Up

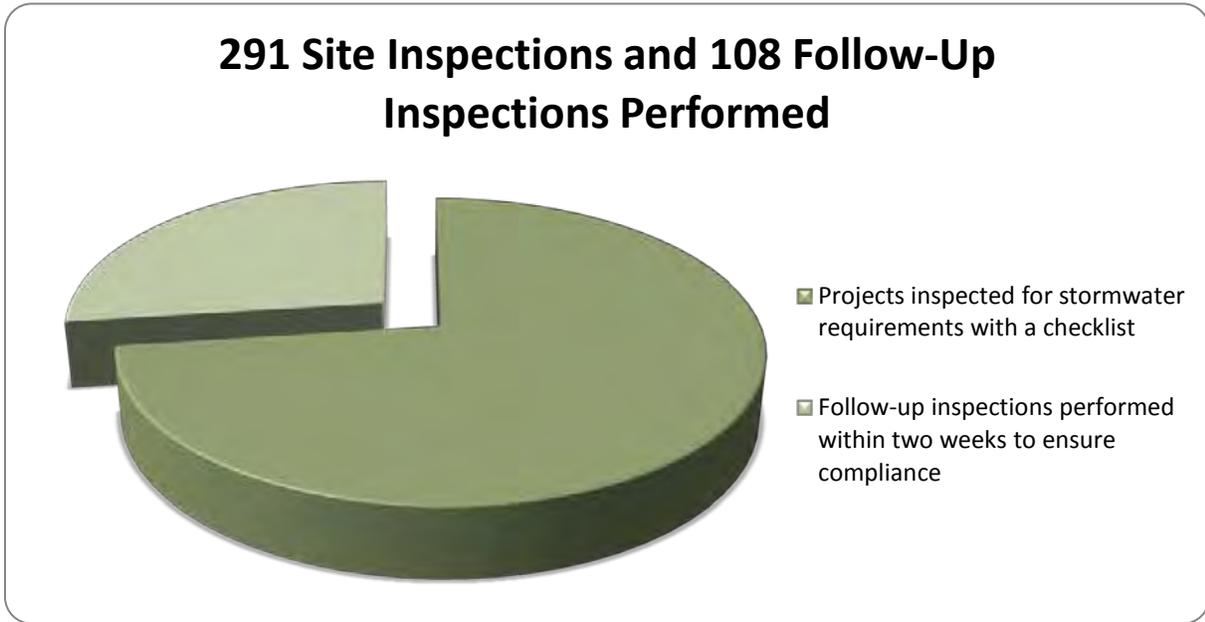
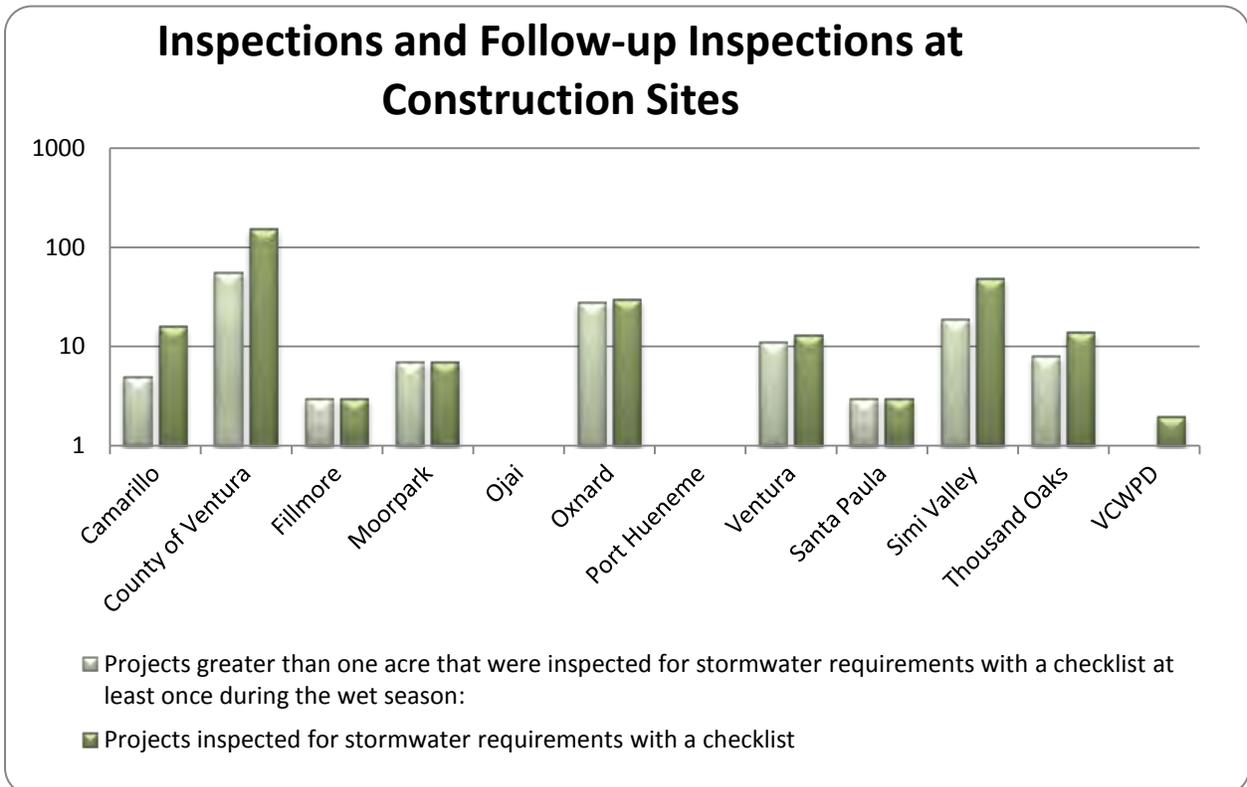


Figure 6-5 Construction Inspections and Follow-up Inspections



6.5.1 Inspect Construction Sites

The Permittees inspect all active construction sites for the implementation of stormwater quality controls a minimum of once during the wet season, and all construction sites with SWPPPs a minimum of once during the wet season to determine if the SWPPP is adequately implemented. During these site inspections, a checklist is completed to document inspection results. If it is determined the SWPPP is not adequately implemented, or when there is evidence of a reasonable potential for sediment, construction materials, wastes, or non-stormwater runoff to be discharged from the project site, the Permittees will inform the responsible party of what needs to be corrected and conduct a follow-up inspection within two weeks, but most often it is much sooner. The follow-up inspections are not always scheduled and often the response needed to correct the situation does not require two weeks to implement.



Storm drain protection during construction

Performance Standard 6-3

Construction sites less than 1 acre were inspected to ensure that the minimum set of BMPs was implemented			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 6-4

Construction sites greater than 1 acre and less than 5 acres inspected to ensure that the minimum set of BMPs was implemented			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 6-5

Construction site greater than 5 acres inspected to ensure that the minimum set of BMPs was implemented			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection			<input checked="" type="checkbox"/>

The Permittees inspect each project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing roadbed surfaces to ensure that the minimum set of BMPs are implemented. This is routinely done at the same time inspections are performed to ensure all work is being performed according to the design and the standards required of public works projects.

Performance Standard 6-6

Projects that include roadbed or street paving, repaving, patching, digouts, or resurfacing roadbed surfaces inspected to ensure that the minimum set of BMPs was implemented			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection			<input checked="" type="checkbox"/>

6.5.2 Implementation of Enhanced Practices at “High Risk” Sites

Construction sites located on hillsides, adjacent to CWA 303(d) listed waters for siltation or sediment, and directly adjacent to ESAs are termed "high risk" sites. The Permittees ensure implementation of enhanced practices such as increased BMP inspection and maintenance requirements at "high risk" sites to ensure that they do not create a threat to water quality.

The Permit requires that "high risk" sites be inspected by the project proponent's Qualified SWPPP Developer or Qualified SWPPP Practitioner or personnel or consultants who are Certified Professionals in Erosion and Sediment Control (CPESC) at the time of BMP installation, at least weekly during the wet season, and at least once each 24 hour period during a storm event that generates runoff from the site. Many of the permittees did not have any designated high risk construction sites but did have the program in place to identify and implement the added requirements.

Performance Standard 6-7

Ensure implementation of enhanced practices such as increased BMP inspection and maintenance requirements at high risk sites			
	Yes	No	N/A
Camarillo			<input checked="" type="checkbox"/>
Ventura County	<input checked="" type="checkbox"/>		
Fillmore			<input checked="" type="checkbox"/>
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard			<input checked="" type="checkbox"/>
Port Hueneme			<input checked="" type="checkbox"/>
Ventura			<input checked="" type="checkbox"/>
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley			<input checked="" type="checkbox"/>
Thousand Oaks			<input checked="" type="checkbox"/>
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 6-8

Require that high risk sites be inspected by the project proponent's Qualified SWPPP Developer or Qualified SWPPP Practitioner at high risk sites			
	Yes	No	N/A
Camarillo			<input checked="" type="checkbox"/>
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard			<input checked="" type="checkbox"/>
Port Hueneme			<input checked="" type="checkbox"/>
Ventura			<input checked="" type="checkbox"/>
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley			<input checked="" type="checkbox"/>
Thousand Oaks			<input checked="" type="checkbox"/>
Watershed Protection	<input checked="" type="checkbox"/>		

Construction sites are dynamic and changing environments and must be routinely inspected by the project proponent to ensure that the appropriate BMPs are in place and maintained. Permittees require that the project proponent of high risk sites retain records of the inspection and a determination and rationale of the BMPs selected to control runoff during the wet season.

Performance Standard 6-9

Did the Permittee require that the project proponent retain records of the inspection and a determination and rationale of the BMPs selected to control runoff during the wet season at high risk sites			
	Yes	No	N/A
Camarillo			<input checked="" type="checkbox"/>
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard			<input checked="" type="checkbox"/>
Port Hueneme			<input checked="" type="checkbox"/>
Ventura			<input checked="" type="checkbox"/>
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley			<input checked="" type="checkbox"/>
Thousand Oaks			<input checked="" type="checkbox"/>
Watershed Protection	<input checked="" type="checkbox"/>		

6.5.3 Inspect for Post-Construction Controls

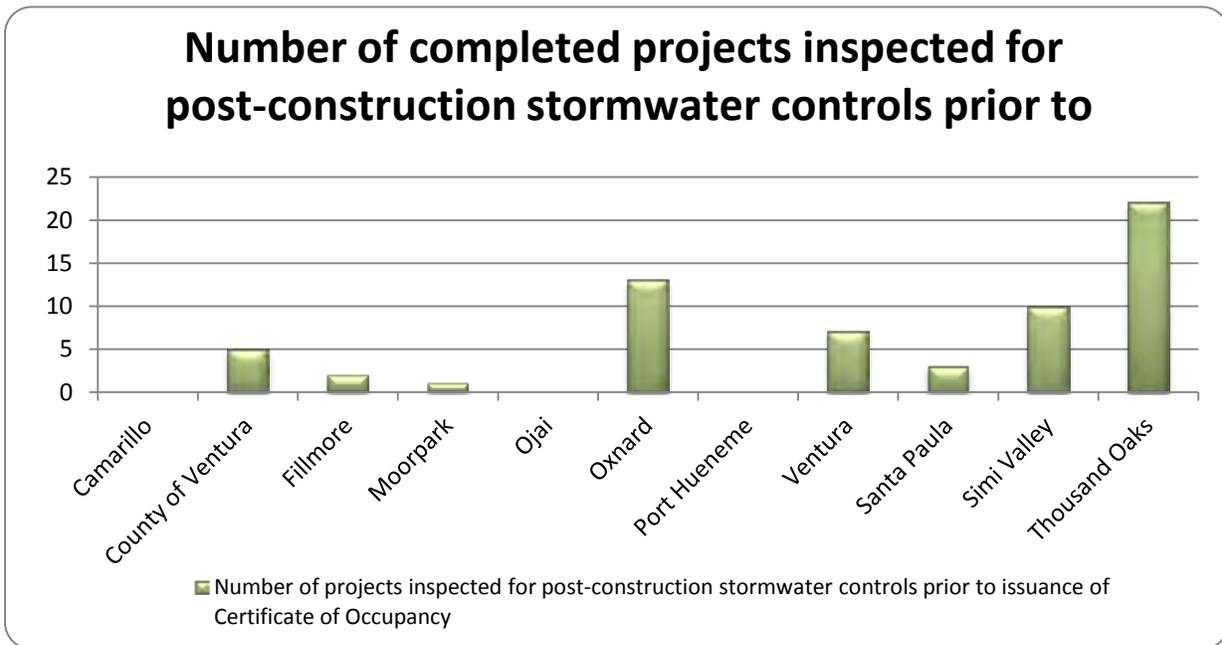
The Permittees inspected the site design as constructed, source control and treatment control BMPs conditioned during the development process to verify that they have been constructed in compliance with all specifications, plans, permits, ordinances, and the MS4 permit prior to approving and/ or signing off for occupancy and issuing the Certificate of Occupancy for all construction projects subject to post-construction controls. Permanent BMPs may be installed at any point during the construction process and therefore may be exposed to runoff conditions much worse than their intended design. The Permit also requires inspections to ensure that the BMPs are in good operating condition and are not in need of maintenance. These inspections are routinely performed at the same time to be cost efficient and to use the leverage the Certificate of Occupancy provides the Permittee. This requirement is in the Permit in Section F – Construction, and also Section E – Planning and Land Development.

As stated previously, the number of projects reaching the final stages of construction and requesting a Certificate of Occupancy will not directly match the number of active construction sites, or grading permits issued due to the elapsed time from permitting, to project initiation, completion and finally occupancy.

Performance Standard 6-10

Inspected constructed site design, source control and treatment control BMPs to verify constructed in compliance with all specifications prior to approving issuing the Certificate of Occupancy			
	Yes	No	NA
Camarillo			<input checked="" type="checkbox"/>
Ventura County	<input checked="" type="checkbox"/>		
Fillmore			<input checked="" type="checkbox"/>
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

Figure 6-6 Inspections Prior to Certificate of Occupancy



6.6 ENFORCEMENT – DC4

The Enforcement Control Measure outlines the progressive levels of enforcement applied to construction sites that are out of compliance with local ordinances and establishes the protocol for referring apparent violations of construction sites subject to the General Construction Permit to the Regional Water Board. The progressive enforcement and referral policy, as well as the accompanying legal authority, is an important tool for providing a fair and equitable approach to bringing contractors and developers into

compliance with the Permittees' municipal code requirements. Enforcement actions range from verbal warnings to the issuance of stop work orders. Legal action may also be taken, although is rarely necessary, as in almost all cases stopping work at a site will focus the developers attention to the BMPs. For repeat offenders, or contractors that have not filed appropriate applications, the referral policy includes notification to the Regional Water Board.

6.6.1 Enforcement Action to Achieve Compliance

When a construction site fails to comply with the SWPPP, minimum BMPs or other stormwater requirements, a Permittee implements the appropriate notification and enforcement procedures. There are five general levels of notification and enforcement for most stormwater related problems for construction projects. These are: Verbal Notification, Job Memorandum, Notice of Violation, Administrative Compliance Order, and Stop Work Order. Sites that are permitted under the construction activities general permit (CASGP) are also referred to the RWQCB if they fail to achieve compliance and a good faith effort has been made by the Permittee to achieve compliance. At a minimum that is two follow-up inspections within three months, and at least two warning letters or NOV's. The decision to use any level of enforcement is based upon the severity of the violation(s). Severe violations may result in all construction activities being stopped at the job site and not allowed to proceed until compliance is achieved. The Regional Board may be notified of severe violations at sites under the CASGP if the situation warrants immediate attention. If such a case occurs, the Permittees will work with Board staff in identification of owners and operators, assist with joint inspections, and other efforts to reduce pollutants from entering an MS4.


CITY OF CAMARILLO – PUBLIC WORKS DEPT. (805-383-5659)

STORM WATER INSPECTION CHECKLIST FOR CONSTRUCTION ACTIVITIES

Work Order: _____

Project Name: _____ Project #: _____
 Project Location: _____ Grading Permit #: _____
 Date/Time: _____ Quantity of Rainfall: _____
 Contractor Information:
 Contact Rep: _____ Company Name: _____ Phone Number: _____

INSPECTION TYPE: Wet Season Dry Season Routine Follow-Up Pre-storm During-storm Post-storm Final

CONSTRUCTION PHASE: Grading & Land Dev Streets & Utilities Vertical Construction Final Landscaping

CONSTRUCTION REQUIREMENTS:
 Is SWPPP/SWPCP on site: Yes No Is Notice of Intent WDID on site: Yes No N/A WDID #: _____

RISK DETERMINATION: Sediment and Receiving Water Risk Level: One Two Three

DEWATERING ACTIVITIES: Has a NPDES Permit been filed: Yes No If yes, is the Permit on site: Yes No

YES	NO	N/A	INSPECTION CRITERIA
			1. SITE PLAN: Does the site plan reflect the project site's condition(s)?
			2. SLOPE EROSION MANAGEMENT: Are slope erosion management BMP's in place per the SWPPP/SWPCP?
			3. SEDIMENT TRAPPING: Are all sandbags, silt bales, and/or silt fences in place and are they functioning properly?
			4. SEDIMENT BASINS: If desilting or sediment basins are being used, are they functioning properly?
			5. SEDIMENT MANAGEMENT AT DRAINAGE DISCHARGE POINTS: Are the drainage discharge points reasonably free of any significant erosion or sediment transport?
			6. SITE SEDIMENT MANAGEMENT: Is sediment, debris, or mud contained within the site?
			7. PUBLIC ROAD SEDIMENT MANAGEMENT: Are ingress and egress locations to the construction area stabilized to prevent the tracking of construction materials offsite or onto impervious areas?
			8. MATERIALS MANAGEMENT: Are material handling and storage areas reasonably clean and free of spills, leaks, or any other harmful materials?
			9. MATERIALS MAINTENANCE: Are all materials properly covered/contained?
			10. DESIGNATED MATERIAL STORAGE AREA: Are all locations of temporary soil stockpiles or construction materials in approved areas?
			11. VEHICLE & EQUIPMENT MAINTENANCE: Are all the equipment storage, cleaning, fueling, and maintenance areas reasonably clean and free of spills, leaks, or any other harmful materials?
			12. PAINT, CONCRETE & SAW CUTTING WASTE MANAGEMENT: Are waste containment areas functioning properly?
			13. BMP IMPLEMENTATION: Has an effective combination of BMPs been selected for the project site?
			14. BMP INSTALLATION & MAINTENANCE: Are the BMPs identified on the SWPPP/SWPCP, and/or installed in the proper location according to plan specifications?
			15. POST-CONSTRUCTION BMPs: Have post-construction BMPs been inspected prior to issuing the Certificate of Occupancy?
			16. HIGH RISK SITES: Has the project proponent's qualified SWPPP personnel inspected the site's BMPs during installation and weekly during the wet season (October-April)?
			17. BMP LOG: Is a log kept on site which indicates BMPs are being evaluated, maintained and/or modified in the event that they fail or are not appropriate?
			18. ILLEGAL DISCHARGE: Is non-stormwater runoff leaving the site?
			19. PUBLIC PROJECT (CIP) SWPPP/PCP: Does the SWPPP/PCP have the required training and inspection records?

Field Directive Issued: Yes No **Non-Compliance Issued:** Yes No
 Verbal Stop Work Order Citation
 Warning Notice of Violation

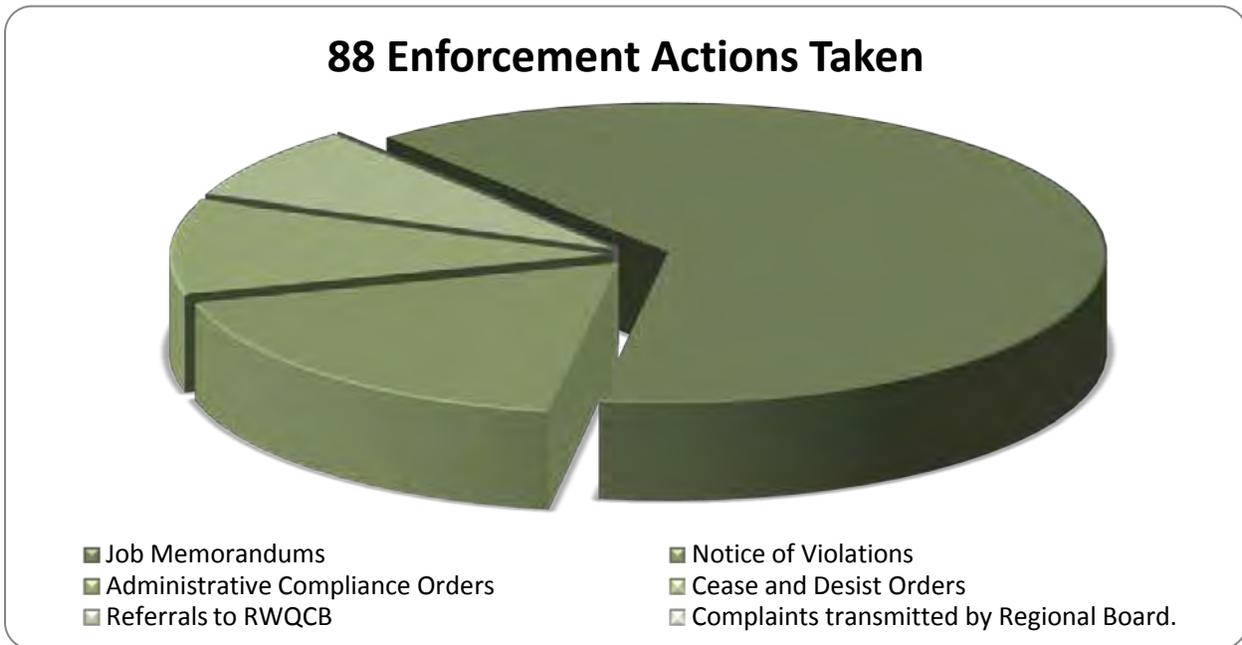
Notes/Comments: _____

Inspector: _____ Phone Number: _____ Contractor's Signature: _____
(Acknowledging receipt of Inspector Report)

White – Storm Water File Yellow – Storm Water Inspector Pink – Site Copy

Construction Inspection Form

Figure 6-7 Enforcement at Construction Sites



6.6.2 Implement Progressive Enforcement and Referral Policy

During the reporting year one construction site failed to return to compliance and was referred to the Regional Water Board for enforcement actions under the CAGSP. Referrals to the Regional Water Board would be summarized in Table 6-2.

Table 6-2 Summary of Referrals

WDID Number	Reason for Referral
N/A	No Referrals in 2011/12

6.6.3 Refer Non-filers Under the CASGP or the Small LUP General Permit

Countywide all construction activities that were required to file for coverage under the CASGP or the Small Linear Underground Project Permit did so. This is because the Permittees have developed the appropriate programs and procedures to ensure that local permits are not granted until the project proponent can provide adequate proof of state permit coverage.

6.6.4 Investigation of Complaints Regarding Facilities - Transmitted by the Regional Water Board Staff

The Permittees are required to initiate an initial investigation of complaints transmitted by the Regional Water Board Staff (other than non-storm water discharges) on the construction site(s) within its jurisdiction. During the reporting period the Regional Board did not transmit any complaints for Permittee investigation; any reports received would be summarized in Table 6-3 Summary of Complaints Transmitted by the Regional Water Board.

Table 6-3 Summary of Complaints Transmitted by the Regional Water Board

Permit #	Initial Investigation conducted within 1 business day? (Y/N)	Inspection of the Facility and its Perimeter? (Y/N)
None	**	**

6.6.5 Support of Regional Water Board Enforcement Actions

If the Regional Water Board is aware of non-compliance at a construction site they may request assistance from the Permittees to support their formal enforcement actions. Fortunately during the reporting period the Permittees were able to use their local authority to keep all construction sites in compliance and assistance to the Regional Water Board enforcement actions was not needed.

Table 6-4 describes what kind of assistance the Permittees could provide and will be used in future reports to summarize any enforcement action assistance.

Table 6-4 Summary of Complaints Transmitted by the Regional Water Board

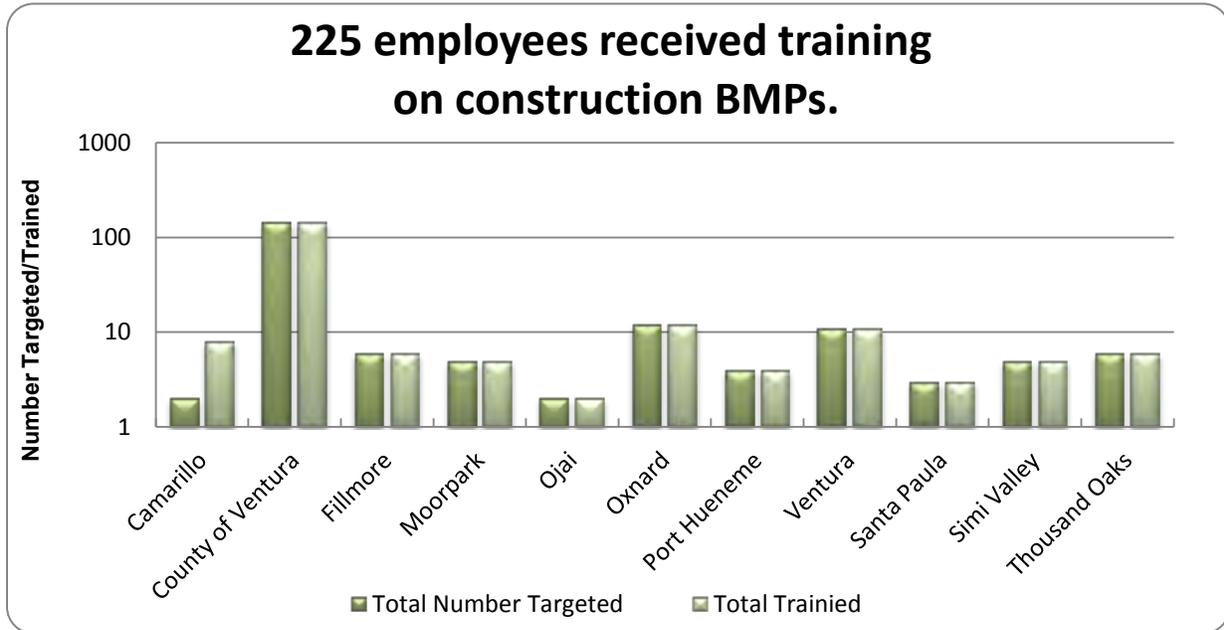
Permit #	Assisted in Identification of Current Owners/ Operators of Properties/Sites? (Y/N)	Provided Staff for Joint Inspections with Regional Water Board Inspectors? (Y/N)	Appeared to Testify as Witnesses in Regional Water Board Enforcement Hearings? (Y/N)	Provided Copies of Inspection Reports and Other Progressive Enforcement Documentation? (Y/N)
**	**	**	**	**

6.7 TRAINING – DC5

Training is important for the implementation of the Development Construction Program Element. An effective training program is one of the best pollution prevention BMPs that can be implemented because it prompts behavioral changes that are fundamentally necessary to protect water quality. The Permittees target employees involved with construction engineering and inspection for training regarding the requirements of the Program for Construction Sites. Training methods varied amongst the Permittees and ranged from informal meetings, formal classroom training, and seminars to self-guided training. The Permittees also trained staff on the prevention, detection and investigation of illicit discharges and illegal connections (IC/ID) associated with construction activities. See Chapter 8 of this report for more information regarding IC/ID training.

During this reporting period, the Permittees trained over 200 key staff, including contractors whose interactions, jobs, and activities affect development construction in stormwater management, construction inspections, SWPCPs, SWPPPs, illicit discharge response, and non-stormwater discharges. Figure 6-8 depicts the number of staff trained in the program areas for each Permittee.

Figure 6-8 Construction Inspection Training



6.8 EFFECTIVENESS ASSESSMENT – DC6

Effectiveness assessment is a fundamental component for developing and implementing successful stormwater programs. In order to determine the effectiveness of the Development Construction Program, a comprehensive assessment of the program data is conducted as a part of the annual report. The results of this assessment are used to identify modifications that need to be made to the program. Each year the effectiveness assessment is reviewed and revised as needed.

By conducting these assessments and modifying the program as needed, the Permittees ensure that the iterative process is used as an effective management tool. Due to the types of data collected for the Development Construction Program, current assessments will primarily focus on Outcome Levels 1, 2 & 3.

- Outcome Level 1 (L1) answers the question: Did the Permittees implement the components of the Permit?
- Outcome Level 2 (L2) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly increased the awareness of its target audience?
- Outcome Level 3 (L3) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly modified the behavior of a target audience?

The following is an assessment regarding the effectiveness of the Development Construction Program.

6.8.1 Plan Review and Approval Process

Review Grading and Construction Permit Applications for SWPPP Requirements

Prior to approving a grading permit, the Permittees require a SWPPP be submitted for projects greater than one acre. (L1) All projects required to submit a State SWPPP, submitted a State SWPPP and filed a

NOI. (L1) Proof of filing a NOI included a copy of the completed NOI form and a copy of the check sent to the SWRCB, or a copy of the letter the SWRCB with the WDID for the project. (L1)

In some jurisdictions, Local SWPPPs were required and submitted for nearly all projects, including those not exceeding Permit thresholds. (L1)

The Permittees required proof of state permit coverage so that all construction activities that were required to file for coverage under the CASGP or Small Linear Underground Project Permit did so.

6.8.2 Inventory

The majority of the Permittees maintained an electronic system to track grading permits, encroachment permits, and any other municipal authorization to move soil. (L1) They required a copy of the SWPPP any time a transfer of ownership took place. Ownership transfer did not happen in each jurisdiction, so some Permittees did not have the opportunity to require a revised SWPPP. (L1)

Inspection and BMP Implementation

As shown in Figure 6-4, the Permittees inspected all active construction sites for stormwater quality requirements during routine inspections a minimum of once during the wet season,. (L1) (L2) For inspected sites that had not adequately implemented their SWPPPs, the Permittees conducted a follow-up inspection within two weeks. Most often, the follow-up inspection occurred much sooner. (L1) (L2) (L3) In addition, the majority of Permittees inspected each project that included roadbed or street paving, repaving, patching, digouts, or resurfacing roadbed surfaces to ensure that the minimum set of BMPs were implemented. This was routinely done at the same time inspections were performed to ensure all work was being performed according to the design and standards required of public works projects. (L1) (L2)

The Permittees required a CPESC to inspect the construction sites at the time of BMP installation, at least weekly during the wet season, and at least once each 24 hour period during a storm event that generated runoff from the site if the site was:

- Within, or adjacent to an ESA
- On a hillside
- Discharging into a sedimentation/siltation impaired water body listed on the CWA 303(d) list

Many of the permittees did not have any of these types of high risk construction sites but did have the program in place to implement the added requirements.

Prior to approving and/or signing off for occupancy and issuing the Certificate of Occupancy for all construction projects subject to post-construction controls, the majority of Permittees inspected the constructed site design, and source control and treatment control BMPs conditioned during the development process to verify that they have been constructed in compliance with all specifications, plans, permits, ordinances, and the MS4 permit, as shown in Figure 6-7.

6.9 ENFORCEMENT

Enforcement Action to Achieve Compliance

When a construction site fails to comply with the SWPPP, minimum BMPS or other stormwater requirements, a Permittee implements the appropriate notification and enforcement procedures. (L1) Sites

that are permitted under the CASGP are also referred to the RWQCB if they fail to achieve compliance in two weeks and a good faith effort has been made by the Permittee to achieve compliance. (L1) (L2)

Figure 6-8 shows each enforcement level and the relative number of enforcement actions taken. The Permittees did not make any referrals of violation of the new development and redevelopment post construction requirements and municipal stormwater ordinances to the Regional Water Board because there were no violations. (L1) No sites were referred to the Regional Water Board to take appropriate enforcement actions under the CAGSP.

Training

During this reporting period, the Permittees trained 226 key staff, double last year, including contractors whose interactions, jobs, and activities affect development construction in stormwater management, construction inspections, SWPCPs, SWPPPs, illicit discharge response, and non-stormwater discharges. (L1) 100% of targeted staff members received training on construction BMPs, as shown in Figure 6-8.

6.9 DEVELOPMENT CONSTRUCTION PROGRAM MODIFICATIONS

On an annual basis the Permittees plan to evaluate the results of the Annual Report, as well as the experience that staff has had in implementing the program, to determine if any additional program modifications are necessary to comply with the Clean Water Act requirement to reduce the discharge of pollutants to the MEP. Any key modifications made to the Development Construction Program Element during the next fiscal year will be reported in the following Annual Report.

7 Public Agency Activities

7.1 OVERVIEW

The Permittees own and operate public facilities, and build and maintain much of the infrastructure of the urban and suburban environment throughout their jurisdictions. Some programs under Public Agency Activities help remove pollutants before they reach receiving waters, and others focus on source control ensuring all the activities performed do not contribute to stormwater pollution to the maximum extent practicable. Therefore public agencies have a dual role: removing pollutants before they are transported by the storm drain system, and preventing pollution from being generated in the operation and maintenance of these facilities.

Permit requirements include both maintenance of infrastructure to remove pollutants and implementing control measures to prevent the generation or transport of pollutants. Maintenance activities include street sweeping and drainage facility inspection and cleaning. As part of their normal operations the Permittees conduct a number of activities (e.g., catch basin cleaning, street repairs, street sweeping) that have the potential to generate or mobilize pollutants. Control Measures in the Public Agency Activities Program Element are designed to ensure that these operations and maintenance activities are performed using processes and procedures to minimize the pollutants generated and the potential for pollutants to enter the storm drain system.

7.2 CONTROL MEASURES

The Permittees have developed several Control Measures and accompanying performance standards to ensure that the public agency activities permit requirements are effectively developed and implemented. For each Control Measure there are accompanying performance standards which, once accomplished, constitute compliance.

The Public Agency Activities Control Measures are organized to be parallel to the organization of the Permit and consist of the following:

Table 7-1 Control Measures for the Public Agency Activities Program Element

PA	Control Measure
PA1	Public Construction Activities Management
PA2	Vehicle Maintenance/Material Storage Facilities/Corporation Yards Management/Municipal Operations
PA3	Vehicle and Equipment Wash Areas
PA4	Landscape, Park, and Recreational Facilities Management
PA5	Storm Drain Operation and Management
PA6	Street And Roads Maintenance
PA7	Emergency Procedures
PA8	Training
PA9	Effectiveness Assessment

7.3 PUBLIC CONSTRUCTION ACTIVITIES MANAGEMENT 1-PA

The Public Construction Activities Control Measure provides protocols to be followed in the design and construction phases of capital projects undertaken by the Permittees. In essence, the Permittees will follow the Planning and Land Development and Construction Programs requirements for all Permittee-owned or operated public construction projects. Those requirements include complying with the Development Planning Program requirements at public construction projects and all the Development Construction Program requirements at Permittee owned or operated construction sites including requiring the development of SWPCP for projects that disturb less than 1 Acre.

Performance Standard 7-1

Comply with all the Development Planning Program requirements at public construction projects.			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 7-2

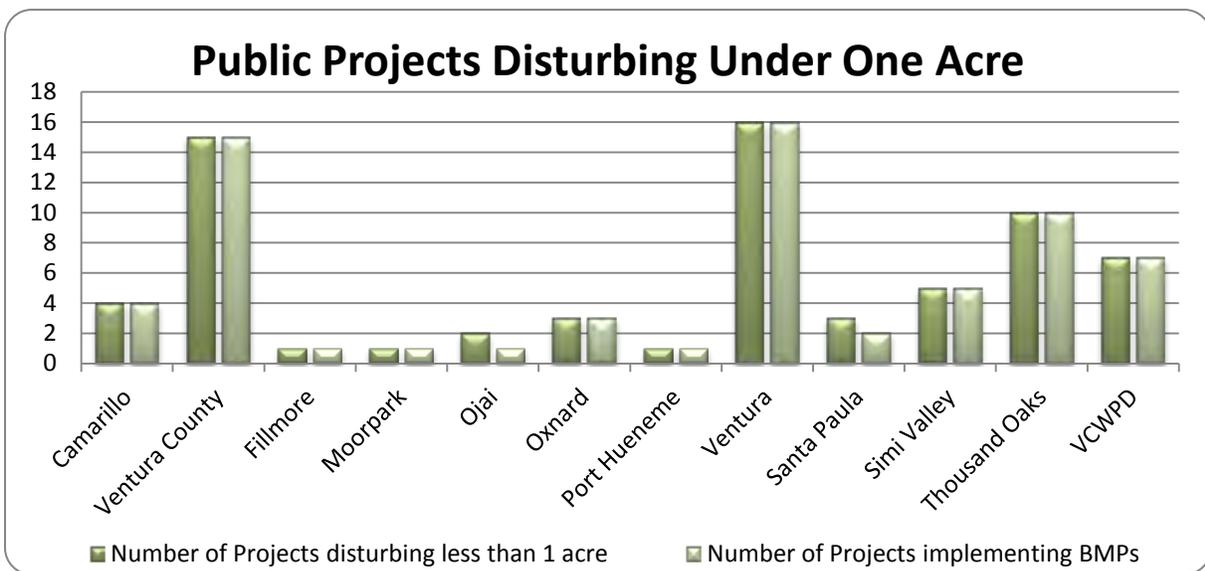
Grading or building permits are not routinely granted for public construction projects within an agency's jurisdiction and so identifying and defining small construction projects is less straight forward. To ensure that extremely small projects such as installing a stop sign or providing wheelchair access to a sidewalk meet permit requirements the Permittees have adopted standard practices to serve as the SWPCP. The practices include the BMPs identified in the permit for construction projects under one acre.

Comply with all the Development Construction Program requirements at Permittee owned construction sites			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 7-3

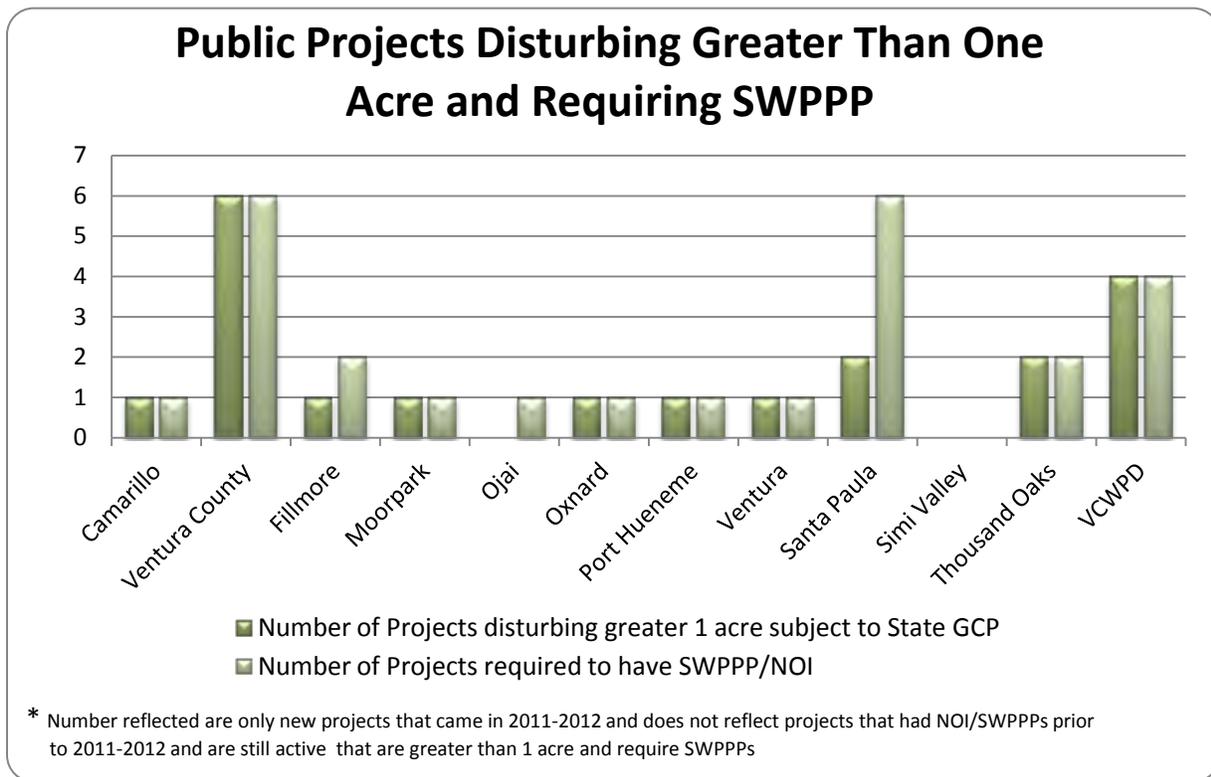
Require the development of a Storm Water Pollution Control Plan for public projects			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Figure 7-1 Public Projects Disturbing Less Than One Acre



Larger projects have requirements in the construction bid documents which require the contractor to draft and implement an approved SWPCP with the size appropriate BMPs. All public constructions projects are required to be in compliance the State’s requirements under the Construction Activities General Stormwater Permit (CAGSP). Figure 7-2 indentifies how many projects the Permittees had that fell under those requirements.

Figure 7-2 Public Projects Disturbing Greater Than One Acre



7.4 VEHICLE MAINTENANCE/MATERIAL STORAGE FACILITIES/CORPORATION YARDS MANAGEMENT/MUNICIPAL OPERATIONS – PA2

The Vehicle Maintenance/Material Storage Facilities/Corporation Yards Management/Municipal Operations Control Measure addresses pollutants entering the storm drain system from Permittee-owned/leased facilities (e.g., vehicle equipment maintenance facilities, material storage facilities, collectively referred to as corporation yards). There are other non-operation oriented facilities that are owned or leased by the Permittees where these permit conditions are not relevant, such as libraries, parks, and office buildings. However, these facilities are still required to comply with all other applicable permit requirements such as pesticide use. Camarillo recently installed covers over the material bunkers at their Corporation yard. In addition, solar panels were installed on top of the covers which will provide power to several buildings at the corporation yard.

The Permittees’ corporation yards support operation and maintenance activities within their jurisdiction. Corporation yards are operated and maintained by the Permittees for the following activities or facilities:

- Vehicle and equipment
- Storage and parking
- Maintenance



Thousand Oaks’ car wash facility that drains to wastewater treatment plant

- Fueling
- Washing and cleaning
- Sign painting activities
- Bulk material storage areas



Material storage covers in Camarillo also support solar panels

7.4.1 Implement Required BMPs for each Facility

The Permittees have written SWPCPs for corporation yards to ensure implementation of appropriate BMPs, including those identified in Table 10 of the Permit. The SWPCPs were required under the previous permit and serve to help implement the current permit requirements. The SWPCPs call for annual inspections to be performed and documented by trained staff. Any insufficiencies identified during inspections are quickly corrected by facility staff.

Table 7-2 Summary of Permittee-Owned and Leased Facilities

Permittee Corporate Yards	Name	Address	Implementation of appropriate BMPs	Address discharges of wash waters from vehicles and equipment washing facilities
Camarillo	Camarillo Corporation Yard	283 South Glenn Drive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
County of Ventura	Saticoy Operations Yard	11201/11251 Riverbank Drive, Saticoy, CA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Government Center, Service Building	800 S. Victoria Avenue, Ventura, CA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Moorpark Maintenance Yard	6767 Spring Street, Moorpark, CA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VCSO Air Unit	Camarillo Airport, Camarillo, CA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	County of Ventura 30 Fire Stations	various countywide locations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fillmore	Fillmore Public Works Yard	711 Sespe Avenue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Moorpark	Moorpark Public Corporate Yard	627 Fitch Avenue, Moorpark, CA 93021	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Moorpark Police Services Center	610 Spring Road, Moorpark, CA 93021	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ojai	City of Ojai Corporate Yard	408 S. Signal St. Ojai, CA 93023	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Oxnard	Oxnard Corporation Yard	1060 Pacific Avenue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Regional Recycling Center	111 S. Del Norte Blvd	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Oxnard POTW	6001 S. Perkins Rd., Oxnard, CA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Oxnard Water Campus	251 S. Hayes Avenue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Port Hueneme	Public Works Surfside Yard	700B E. Port Hueneme Rd.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Public Works Industrial Yard	746 Industrial Avenue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ventura	SanJon Corporate Yard	336 SanJon Road	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Santa Paula	Corporation Street Yard	903 Coporation Street	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Water Yard	180 South Palm Avenue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Simi Valley	Simi Valley Police Department	3901 Alamo St, Simi Valley CA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Simi Public Service Center	490 West Los Angeles Ave	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Thousand Oaks	Municipal Service Center	1993 Rancho Conejo Blvd.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VCWPD	WPD Moorpark CY	6767 Spring Rd, Moorpark, CA 93021	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	WPD Saticoy CY	11251-B River Bank, Ventura, CA 93004	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

7.5 VEHICLE AND EQUIPMENT WASH AREAS – PA3

The Vehicle and Equipment Wash Areas Control Measure addresses pollutants entering the storm drain system from Permittee-owned/leased vehicle and equipment wash areas. The Permit provides several options to eliminate wash water discharges from vehicles and equipment washing facilities by implementing one of the following:

- Self-contain, and haul-off for disposal;
- Equip with a clarifier;
- Equip with an alternative pre-treatment device; or
- Plumb to the sanitary sewer.

The Permittees have been successful in implementing applicable BMPs to eliminate wash water discharges from vehicles and equipment washing. As municipal facilities are constructed, redeveloped, or replaced all vehicle wash areas will be plumbed to the sanitary sewer or be self-contained and all wastewater disposed of legally.

7.6 LANDSCAPE, PARK, AND RECREATIONAL FACILITIES MANAGEMENT – PA4

The Landscape, Park, and Recreational Facilities Management Control Measure ensure that the discharges of pollutants from the Permittees’ use and storage of fertilizers and pesticides are reduced. The control measures include the use of BMPs that promote the use of integrated pest management (IPM) and retention and planting of native plant species requiring less water and chemical augmentation to remain healthy.

7.6.1 Implement IPM Program

A model integrated pest management (IPM) program was drafted through the Public Agencies Activities Subcommittee and used as a template by the Permittees to develop their own plans. This standardized protocol was posted on the Program’s website November 2009. The due date in the Permit for implementation of IPM plans was October 8, 2010.

The purpose of this standardized protocol is to define an application protocol for the routine and non-routine application of pesticides, fertilizers, and herbicides (including pre-emergents). This protocol provides a comprehensive policy to comply with the Ventura County Permit.

The intent is to focus on preventing pesticides, fertilizers, and herbicides from entering the storm drain system and discharging to receiving waters. This protocol is applicable to 1) the outdoor use of pesticides, herbicides, and fertilizers; 2) the use of pesticides and fertilizers where the materials may come into contact with precipitation; 3) the use of pesticides, herbicides, and fertilizers where these materials may come into contact with runoff (natural or irrigation); and 4) the use of pesticides, herbicides, or fertilizers anywhere where they may be directly or indirectly discharged to a storm drainage system.

The protocol is applicable to Permittee staff and contracted services that apply pesticides, fertilizers, or herbicides. Such staff commonly include, park, public works, building/grounds maintenance, and pesticide application staff. It is not applicable to the indoor use of pesticides, but is applicable to the consequential outdoor handling, mixing, or disposal of materials related to indoor use. This protocol also does not apply when another NPDES permit and/or abatement orders are in effect at the selected site. Furthermore, this protocol is not intended to replace federal or state requirements or provide complete directions for applying, handling, transporting, mixing, or storing pesticides, fertilizers, or herbicides.

An effective IPM program should include the following elements:

- Pesticides are used only if monitoring indicates they are needed according to established guidelines.

- Treatment is made with the goal of removing only the target organism.
- Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial, non-target organisms, and the environment.
- Use of pesticides, including Organophosphates and Pyrethroids do not threaten water quality.
- Partner with other agencies and organizations to encourage the use of IPM.
- Adopt and verifiably implement policies, procedures, and/or ordinances requiring the minimization of pesticide use and encouraging the use of IPM techniques (including beneficial insects) in the Permittees' overall operations and on municipal property.
- Policies, procedures, and ordinances shall include commitments and timelines to reduce the use of pesticides that cause impairment of surface waters by implementing the following procedures:
 - Quantify pesticide use by its staff and hired contractors.
 - Prepare and annually update an inventory of pesticides used by all internal departments, divisions, and other operational units.
 - Demonstrate reductions in pesticide use.

The prevention of pesticides from harming non-target organisms is the primary goal of the Permittees IPM program. The Permit also asks for the demonstration of a reduction in pesticide use, however that is not as simple as comparing one year's use to another. Many factors go into the decision to use pesticides and year to year variables can have a significant impact on that decision. For example, an above average wet year will require more weed abatement than a dry year. The need to address an insect infestation before it spreads will require an intensified use of pesticides in that area. Since year to year reductions cannot be accurately measured due to variable needs, the reduction in use of pesticides by the Permittees will be compared to the amount of pesticides that would have been used under a non-IPM program.

Performance Standard 7-4

Implement an integrated pest management (IPM) program consistent with Permit			
	Yes	No	Draft
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

7.6.2 Maintain and Expand Internal Inventory on Pesticide Use

Permittees require all staff applying pesticides to be either certified by the California Department of Food and Agriculture, or under the direct on-site supervision of a certified pesticide applicator, as defined in the standardized protocol. Permittees have also restricted the purchase and use of pesticides and herbicides to certified staff.

Performance Standard 7-5

Prepare an annual update an inventory of pesticides used by all internal departments and hired contractors			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Permittees that contract out for pesticide applications have included contract provisions requiring the contract applicator meet all requirements of this program. Contract language includes compliance with the standardized protocol, the prohibitions and requirements for certification, and supervision of pesticide applicators.

Performance Standard 7-6

7.7 STORM DRAIN OPERATION AND MANAGEMENT – PA5

The Storm Drain Operation and Management Control Measure provides for the long-term performance and integrity of the Permittees' storm drain system. The Permittees must prioritize catch basins for cleaning based on the required level of maintenance, and all catch basins are marked with a storm drain message, whether stenciled or permanently imprinted. This Control Measure also includes a requirement for special events to prevent debris accumulation in catch basins and storm drains.

Establish standard protocols for routine and non-routine application of pesticide consistent with the permit requirements			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

7.7.1 Implement Storm Drain System Mapping

The Permit requires that the Permittees to create a map at a scale and in a format specified by the Principal Permittee showing the location and length of underground pipes 18 inches and greater in diameter, and channels within their permitted area. A schedule was provided to allow time to develop the needed information. The first due date was October 6, 2010. Since Ventura Counties cities are all separated by open space and the MS4 from one city does not discharge to another, the need to integrate the maps into a countywide storm drain map is not as imperative as the need for a Permittee to be able to know what is upstream from any point in their MS4, and where that water will discharge. Given that the priority for the mapping is internal to the agency operating the system, the Permittees were given the autonomy to decide what form of mapping will work best for their needs. All maps will be incorporated into the Principal Permittee's Watershed Protection District, GIS system as best as possible. This incorporation will allow for other formats to be available and viewed when needed.

Performance Standard 7-7

Prepare a map or list of catch basins, with GPS coordinates, designations, and rationale for designations			
	Yes	No	in progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley			<input checked="" type="checkbox"/>
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection			N/A

7.7.2 Implement Catch Basin Maintenance Program

Each Permittee developed the criteria and method of a catch basin mapping and prioritization system for their agency. This is due to the different types of databases, mapping systems, infrastructure, and methods used by the Permittees for inspection and cleaning. The Permit does not specify the criteria for designating catch basin priorities, nor require a uniform system of mapping catch basins. The Permittees have begun to implement catch basin cleaning schedules based upon the prioritization designations as required by the Permit, however, the requirement of a list or map of catch basins with their GPS coordinates and their prioritization designation was due July 8 2011. Figure 7-4 through Figure 7-7 shows the Permittees' efforts on prioritization, inspection and maintenance.

Figure 7-3 Example of Storm Drain Map

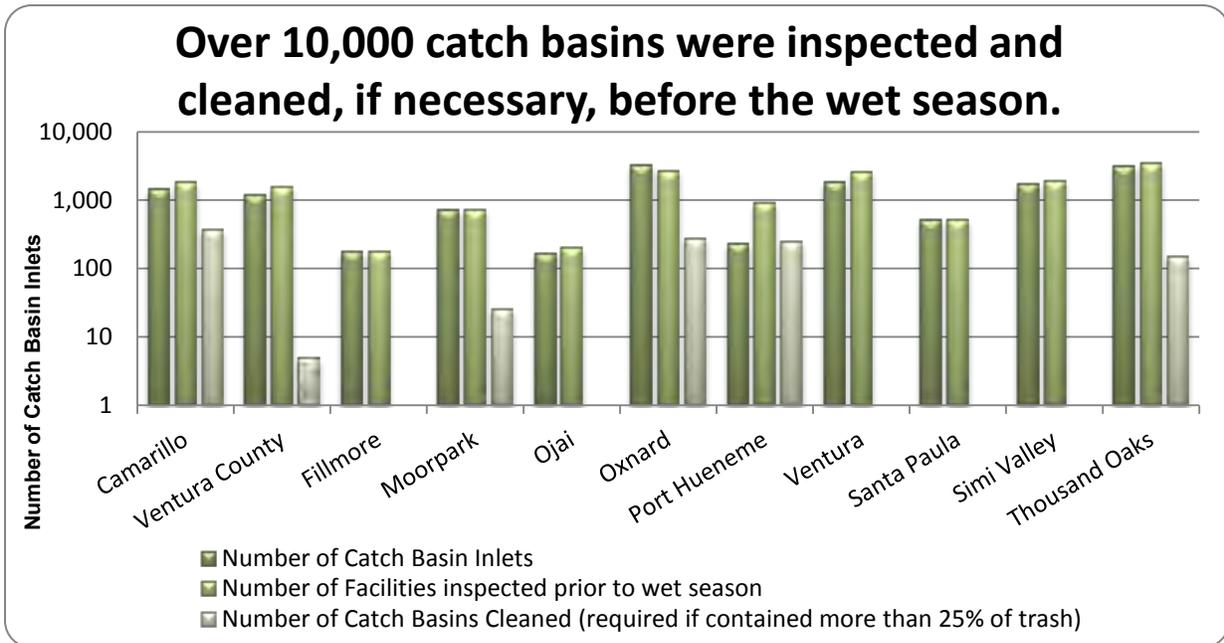


Permittees routinely inspect catch basins and other drainage facilities that are a part of their system. These inspections are scheduled and completed in accordance with the requirements of the catch basin prioritization (due July 2011). The prioritization requires:

- Priority A inspected 3 times a wet season and once during the dry season;
- Priority B inspected once during the wet season and once during the dry season;
- Priority C inspected a minimum of once per year.

Over 230 tons of debris was removed from catch basins countywide through the storm drain maintenance program.

Figure 7-4 Catch Basin Inspections and Cleaning



Catch Basin Cleaning Using a Vacuum Truck

Inspections include the visual observation of each catch basin, and open channel to determine if the device or conveyance has accumulated trash, sediment or debris requiring removal. All debris removed (including trash and natural debris such as leaves from street trees) from the system is disposed of properly and therefore represents pollutants that would have been washed downstream to a receiving water. For catch basins, “as-needed cleaning” occurs whenever trash, sediment, or debris accumulation is found to be at least 25% of capacity. Watershed Protection District cleans and maintains their flood control facilities, but does not operate any catch basins that receive runoff directly from streets or roads.

Performance Standard 7-8

Inspect the legibility of the catch basin label by all inlets before the beginning of the wet season			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection			<input checked="" type="checkbox"/>

Figure 7-5 Priority A Catch Basins Inspected and Cleaned

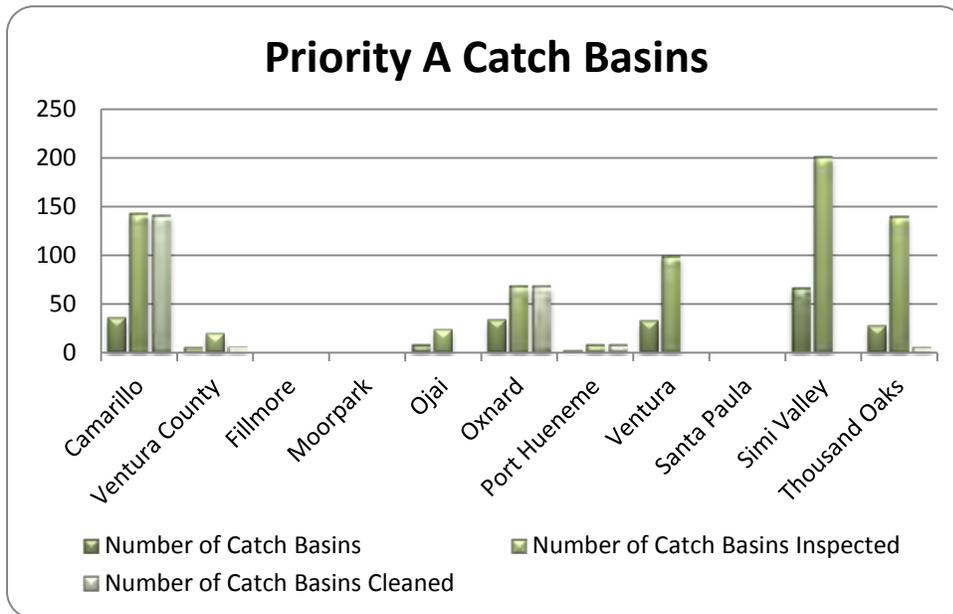


Figure 7-6 Priority B Catch Basins Inspected and Cleaned

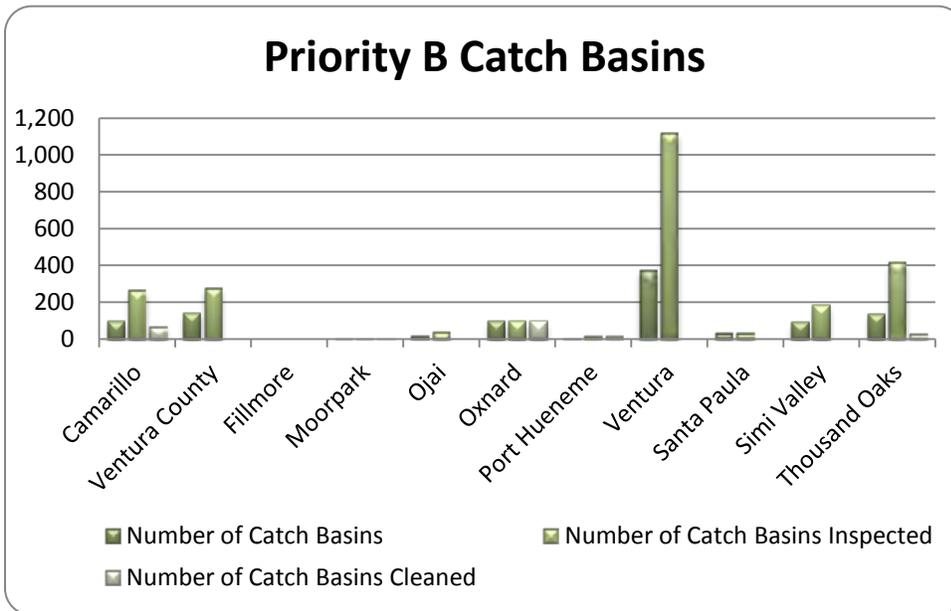
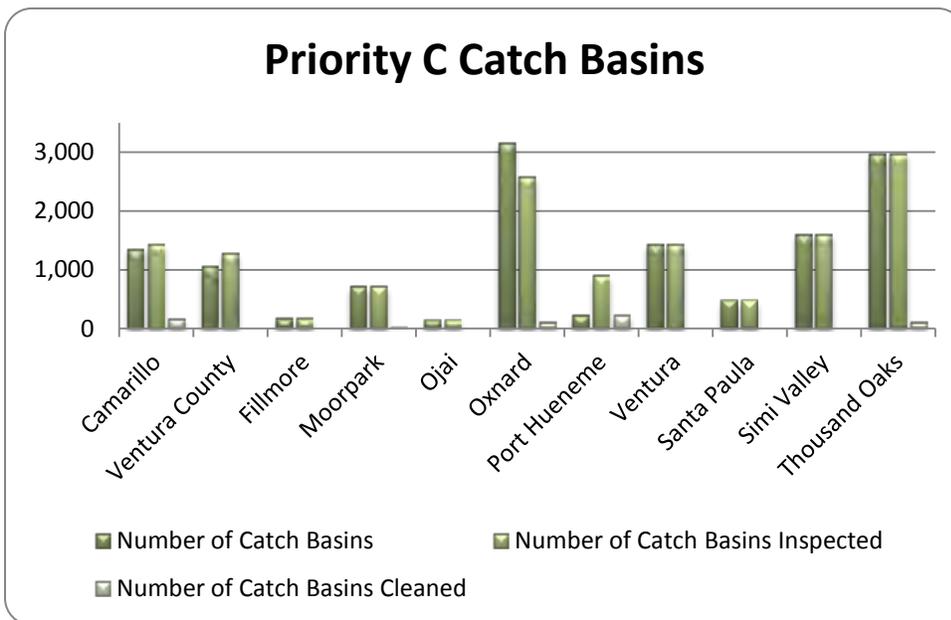


Figure 7-7 Priority C Catch Basins Inspected and Cleaned



7.7.3 Install Trash Receptacles

Permittees have identified the bus stop areas which are typically located in commercial areas and near schools as areas to install trash receptacles. All Permittees have installed trash receptacles at areas subject to high trash accumulation. Commercial areas are typically required to install trash receptacles at store fronts to aid in proper disposal. Trash programs usually involve agency solid waste divisions who bring their expertise in performing trash audits to determine the need for additional trash receptacles.

Performance Standard 7-9

Trash receptacles, or equivalent trash capturing devices in areas subject to high trash generation within jurisdiction			
	Yes	No	in progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 7-10

7.7.4 Install Additional Trash Management Devices and Programs

The Permittees have begun the implementation of this performance standard which is due July 8, 2012 after the reporting period of this report. Some agencies already had trash capturing devices installed in known problem areas before the permit was adopted. See below for the Permittee’s specific actions to control trash and litter:

Trash receptacles cleaned out and maintained as necessary to prevent trash overflow			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Camarillo - Camarillo installed 31 full capture connector pipe screen trash devices at all priority A locations throughout the city, in addition they installed trash receptacles at the city's bus stop areas which are typically located in commercial areas and near schools. Trash containers were also installed at entrances to city-maintained trails and the city's park. In addition, the city contracted special monthly trash cleanups along major arterials in the commercial areas of the Revolon Slough/Beardsley wash subwatershed. Also, the city mailed letters to all commercial businesses/property managers (42) in the Revolon Slough/Beardsley wash subwatershed requesting they maintain their property and keep it free of litter. Further, via California Coastal Cleanup Day, the City held cleanups at two locations in which over 340 volunteers removed approximately 1,800 lbs. of trash and recyclables. The City also published an article, “Do you Know Where Your Litter Goes?”, in the May/June 2012 Cityscene newsletter which was mailed to all residents.

County of Ventura – Public Works Agency - Transportation provides for street sweeping in high trash (Priority A) areas. Trash and litter pick-up are required by the Encroachment Permits. All public park facilities are equipped with trash receptacles and covered 3-yard bins for public use. Trash containers are checked and emptied as needed on a daily basis or more often as required in accordance with use patterns.

Airports staff patrols facilities and is able to identify moderate trash areas, especially prior to rain and during high wind events.



Hard working trash excluder

Fillmore - The city has regular Public Works crew and trash truck to empty receptacles and to clean areas of high trash. During special events the use permits require additional trash facilities.

Moorpark – Annual inspections of the City's catch basins determine whether or not any Priority A catch basins exist. A Priority A catch basin is defined as any catch basin that is found with 25% or more of trash. Majority of commercial business areas are required to have trash containers installed at the entrances/exits of the buildings. Bus shelters also include a 32-gallon trash container, which is emptied at least weekly.

Ojai – Performs field inspections, placement of no dumping signs, and clean up after public events, as part of the city permit process users are required to provide BMP and cleanup procedures.

Oxnard - The City of Oxnard utilizes the services of Oxnard City Corps to inspect and maintain the high priority catch basins. In September 2010, City Corps started using a small street sweeper/vacuum modified with a hose attachment to remove debris from the catch basins. The City of Oxnard owns and maintains two Fresh Creek trash removal devices located downstream of the high priority areas in the Wooley Road and Oxnard West Drains. The City of Oxnard has made a request to the County Watershed Protection District to install trash booms downstream of the high priority catch basins that flow into the J Street and Oxnard Industrial Drain.

Port Hueneme - Street sweeping goes beyond permit requirements. Solid Waste performs regular audits during their day to day services. The city is part of a joint effort with City of Oxnard that monitors and collects trash from the Oxnard West Drain. The city provides cleaning services and also supplies nets for the Fresh Creek device in the Oxnard West Drain. Areas where Priority A basins are located have full inlet screens and/or trash capture devices that were previously installed

Simi Valley - Identified the following high trash areas: pedestrian high traffic areas; restaurant concentration areas; special events. The city increased the number of trash receptacles in public areas prone to high amount of trash. The city has increased trash pickup to weekly or bi-weekly in public areas prone to high amount of trash.

Thousand Oaks - Trash cans at the MSC are emptied daily and roll off boxes containing scrap metal and greenwaste are covered with a tarp during inclement weather. Fifty-six public trash and recycling

containers are distributed at high trash areas, including high schools, California Lutheran University, the day labor site and other business, recreation and residential areas throughout the city where high foot traffic necessitates proper disposal options. A majority of these container are located near bus stops to meet the needs of both public transportation riders and pedestrians. All containers are serviced twice weekly by the city's franchised commercial solid waste hauler, Waste Management.

The MSC collects and recycles greenwaste, metal, antifreeze, motor oil and wheel weights. In addition to regular cleaning, clearing and sweeping the interior area of the MSC, all catch basins are cleaned regularly and include the use of a filter within each catch basin.

Ventura - Data collected from the cleaning of catch basins was used to determine the location of "high trash" generating areas. Those catch basins were designated "Priority A" catch basins and were fitted with trash excluder devices. In addition, other areas of the City were considered for the installation of trash excluders and at present over 100 devices have been installed. The City has gone out to bid for an additional 106 devices that will be installed by the end of the year. City staff regularly remove trash from right-of-way areas throughout the City. These include streets, medians, parkways, on and off ramps to freeways, walking and biking paths, and other public areas which may not otherwise receive litter abatement services. An average month requires over 100 "cleaning incidents" with significant amounts of litter and debris along public right-of-ways removed. Debris can include small objects such as cigarette butts or large items such as mattresses and couches. The City of Ventura has begun a "Safe and Clean" program that require City staff to participate in the cleanup of homeless encampments throughout the City. Trash receptacles throughout the City are emptied 1-5 times per week, depending on the location and the trash generated. The City trash contractor monitors and removes trash before it accumulates and overflows. In addition, bus shelters that have trash receptacles located nearby, are monitored and emptied daily if required. This last year the Ventura Pier was targeted for adding six recycle bins, six trash bins, and two fishing filament bins.

Performance Standard 7-11

Provide additional trash management practices in areas defined as Priority A? (by July 8, 2012)			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark		<input checked="" type="checkbox"/>	
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>		
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

7.7.5 Trash Management at Public Events

Events in the public right of way, or wherever it is foreseeable that substantial quantities of trash and litter may be generated, require the following measures:

- Proper management of trash and litter generated

- Arrangement for temporary screens to be placed on catch basins
- Arrangement that trash is removed after the event

The Permittees appreciate having the ability to select the option that will work best in their jurisdiction and have employed several methods to ensure trash does not get into a storm drain after a public event. Most cities use the power of the Special Use Permit or Temporary Use Permit. With this they can, and do, require a trash and recycling management plan and/or a substantial deposit before issuing an event permit. Funds can be withheld if trash has not been properly managed and costs recovered and even fines levied if after the event staff is needed to clean up. A few agencies take on this responsibility and have street sweepers employed to clean streets of any trash immediately after a large event, or services the affected drains with a vacuum truck after the event has concluded.

Camarillo - Camarillo inspects the area after each public event held in public right-of-way and if trash is present, removes the debris. If a large quantity is left, the city withholds funds from the Special Use Permittee's deposit to cover expenses related to trash removal.

County of Ventura - All park facilities are equipped with trash containers that are checked and emptied on a daily basis. Additional containers are provided as required. Additional collection dates are scheduled if needed based on historical use patterns, site reservations, and field assessment by staff.

Airports Department added extra trash receptacles and dumpster bins. Also, Airports Department swept paved areas and increased litter and trash pick-ups.

Fillmore - Public events permits are required to have temporary trash receptacles and to pay for staff or to have a volunteer crew to clean trash during events. The Public Works Department also provides additional manpower for events that are designated City events.

Moorpark – Standard conditions for Temporary Use Permits (which include public events) include requirements for protection of the storm drain system from litter and other material. Proper trash management is required for the event and the nearby catch basins must be screened during the event.

Oxnard - Technical Services Program-Stormwater staff worked in conjunction with the Planning Division to revise the Temporary Use Permit Application. A "Drainage and Trash Management" requirement has been added as a condition for obtaining a TUP. Any applicant seeking a TUP for a public event where substantial quantities of trash may be generated must meet the above referenced conditions.

Ojai - As part of the city permit process permitted public events are required to provide BMP and cleanup procedures.

Port Hueneme - City staff vacuums out catch basins immediately after the events and also has the event host use BMPs such as placing fiber rolls in front of inlets during the course of the event.

Santa Paula - The city has increased the number of trash receptacles in public areas prone to high amounts of trash. The city schedules trash pickup immediately following public events.

Simi Valley – has created a trash management plan for public events which requires the event's responsible party to obtain a permit. This permit gives specific requirements for trash management at the event.

Thousand Oaks - Parking and storage areas are kept clean and orderly. Litter control at the MSC is managed by weekly sweeps of the facility grounds and by daily pick up of litter. The limited number of public events at the MSC include follow-up litter removal. City-sponsored public events, events charging admission fees and events attracting 2000+ participants are required to submit a Recycling Plan to ensure that proper solid waste management procedures are in place before the city will issue a Special Event Permit. Additionally, the City Environmental Programs division loans recycling containers to non-profit organizations free of charge for public events within the city.

Ventura - Most large public events are concentrated in the Downtown District. A total of 26 trash excluders were installed in the catch basins in this area. They are cleaned on the same schedule as the "Priority A" drains. The Downtown Organization employs personnel to clean up litter and other debris as part of their daily routine. The addition of one trash receptacle in the downtown mini-park and one trash receptacle on an additional street corner in the downtown, brings the total trash receptacles to 46 in the downtown..

7.7.6 Implement Storm Drain Maintenance Program

Permittees also routinely inspect and clean their drainage facilities during the year on an as-needed basis. "Routine cleaning" for these facilities, means the removal of accumulations of trash, sediment and debris likely be washed downstream with the next runoff event or cause a loss of hydraulic capacity and result in potential flooding.

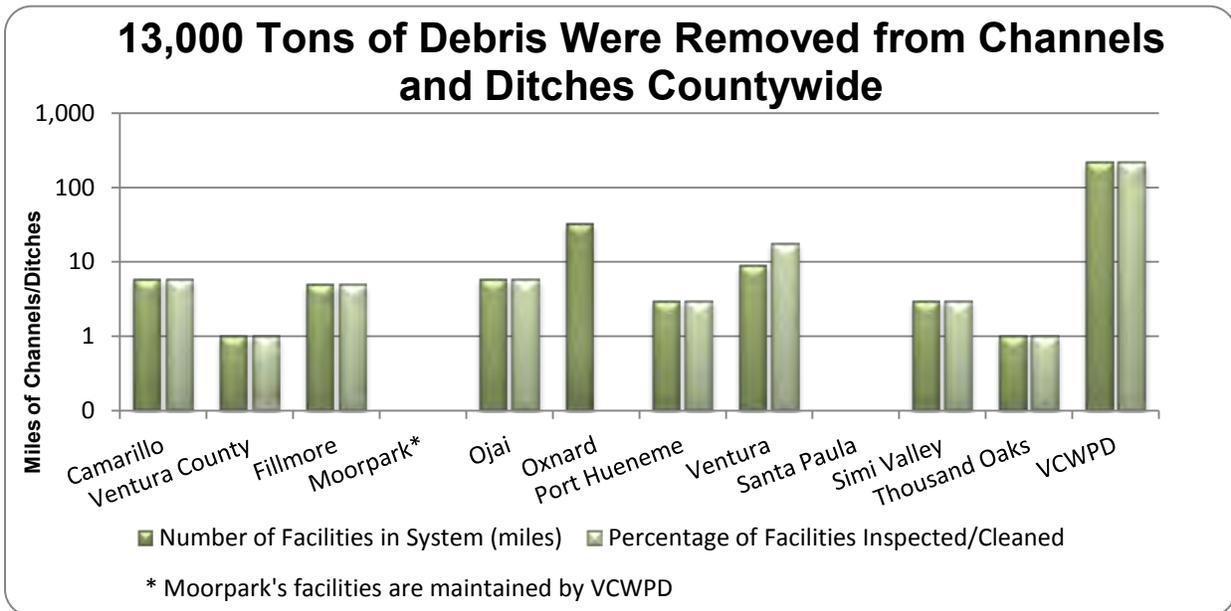
The Public Information and Participation section requires Permittees to have completed labeling or marking the curb inlets in their entire storm drain system, but the inspection and relabeling is required under Public Agencies. During the reporting period, some Permittees maintained their inlet signs by reapplying stencils/markers as they wore out and applying stencils/markers to new inlets as they were installed.

Performance Standard 7-12

Require appropriate litter control measures for public events			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		

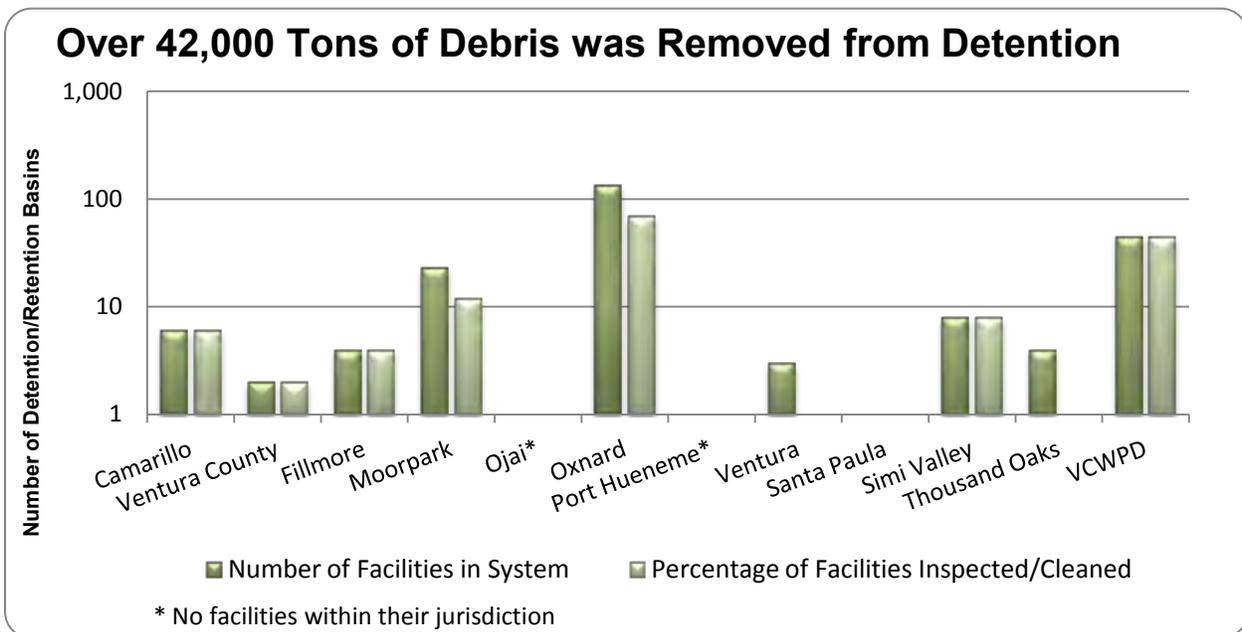
Signs at curb inlets have varying useful lives due to the materials from which they are constructed (e.g., paint or thermoplastic), their position (e.g., on top of curb or on curb face), and wear factors (e.g., traffic, street sweeping, sunlight). As a result, the Permittees have different programs to maintain curb inlet signage within their respective jurisdictions. Some Permittees replace a portion of their signs each year whereas others re-sign all inlets every few years. In the cases where a Permittee has a separate program for catch basin label maintenance from their catch basin debris maintenance program the catch basin debris maintenance inspection does not inspect for the label. Catch basin label data is reported in public outreach program.

Figure 7-8 Tons Removed from Channels and Ditches



When performing cleaning activities, Permittees implement appropriate BMPs to prevent sediments and debris from being washed downstream. By removing this amount of material from the catch basin inlets, open channels, and detention basins the Permittees prevent the passage of these materials to downstream receiving waters. During the reporting period, the Permittees tallied the collection of over 55,000 tons of solid debris from drainage facility maintenance activities.

Figure 7-9 Tons Removed from Detention Basins



7.7.7 Implement Spill Response Plan

Within their respective jurisdiction the Permittees implement a response plan for spills generated from their operations that have the potential to enter the MS4 system. Response plans include:

- Investigation of all complaints received within 24 hours of the incident report;
- Containment response within 2 hours to spills upon notification, except where such overflows occur on private property, in which case the response should be within 2 hours of gaining legal access to the property; and
- Notification to appropriate public health agencies and the Office of Emergency Services (OES).

Unfortunately, even with good training and well maintained equipment there are occasions where a spill or release will happen and need to be cleaned up. Cleanup can be as simple as dispatching a crew to pick up fallen debris, or a street sweeper or vacuum truck to clean an area or catch basin and storm drain after a known spill. It could also become a major multi-agency operation if hazardous materials are involved.

7.7.8 Inspect and Maintain Permittee-Owned Treatment Control BMPs

Permittees that own or are authorized to maintain treatment control BMPs have programs to implement an inspection and maintenance program for those treatment control BMPs, including post-construction treatment control BMPs. Private BMPs required for new development are managed in different ways. Some Permittees do not want to be responsible for the cleaning and maintenance of these BMPs and limit their role to inspection and enforcement to ensure effectiveness. Others will take on that responsibility on a case by case basis, and there are occasions where a Permittee has installed their own treatment BMPs to improve water quality.

When Permittees are performing maintenance of structural BMPs they implement their own BMPs to ensure that residual water produced by a treatment control BMP (not internal to the BMP performance) is:

- Hauled away and legally disposed of; or
- Applied to the land without runoff; or
- Discharged to the sanitary sewer system (with permits or authorization); or
- Treated or filtered to remove bacteria, sediments, nutrients, and meet all limitations

7.8 STREET AND ROADS MAINTENANCE – PA6

The Street and Roads Maintenance Control Measure ensures that the streets and roads are both cleaned to reduce pollutants and maintained in ways that prevent the release of pollutants..

7.8.1 Implement Street Sweeping Program

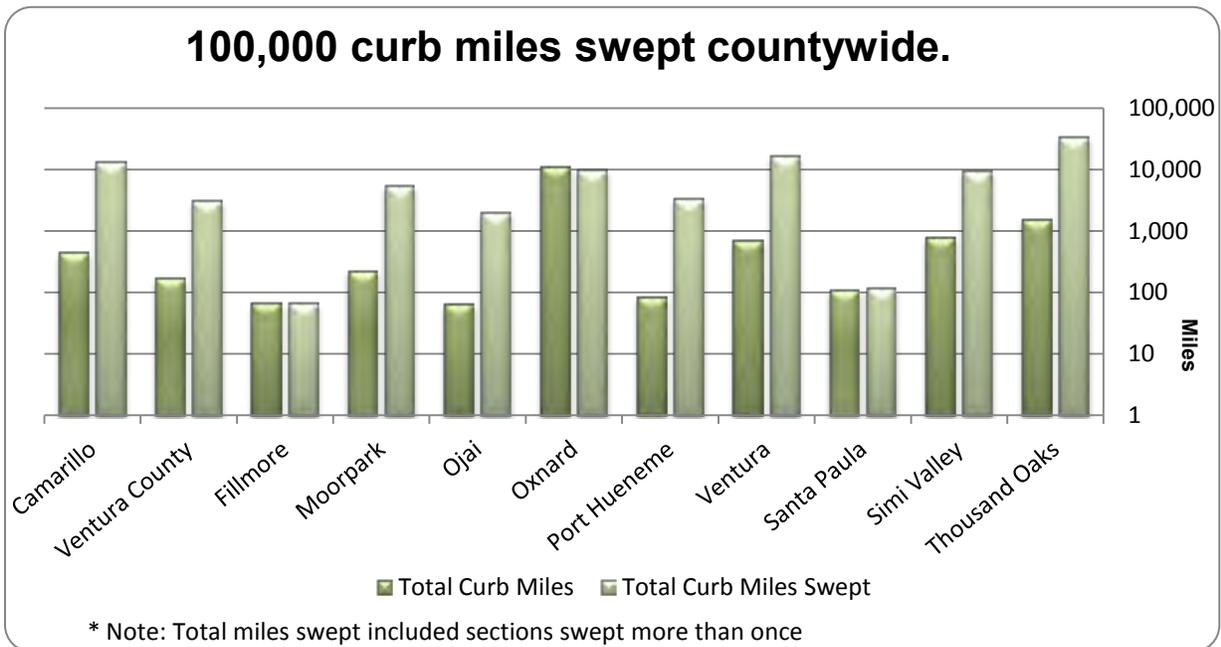
Permittees have identified curbed streets within their jurisdiction and have implemented a sweeping program for these streets. In many cases the frequency of street sweeping is beyond the permit requirement of at least twice a month for commercial areas and areas subject to high trash generation.

To increase the efficiency of the street sweeping, Permittees have made an effort to encourage voluntary relocation of street-parked vehicles on scheduled sweeping days. This has been achieved by placing temporary “no stopping” and “no parking” signs, posting permanent street sweeping signs and/or distributing street sweeping schedules to residents and businesses. Many of the Permittees have coordinated street sweeping to follow the routine trash collection days in order to remove any litter left in the streets by the trash removal service.

Performance Standard 7-13

Perform street sweeping of curbed streets in commercial areas and areas subject to high trash generation at least two times a month			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection			<input checked="" type="checkbox"/>

Figure 7-10 Curb Miles Swept



7.8.2 BMP Implementation for Road Reconstruction Projects

For any road reconstruction project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing road surfaces, the Permittees require that appropriate BMPs are implemented. The vast majority of this work falls under the definition of routine maintenance as the road will maintain the line and grade and original purpose of the facility. The implementation of these BMPs ensures the project will not impact stormwater without the need for a formal SWPPP or other documentation.

Performance Standard 7-14

Require that appropriate BMPs be implemented for any project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing road surfaces			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

7.9 EMERGENCY PROCEDURES – PA7

The Emergency Procedures Control Measures ensures that each Permittee can conduct repairs of essential public service systems and infrastructure in emergency situations with a self-waiver. A self-waiver is required when there is a discharge to the storm drain system and the repairs needed to halt that discharge cannot be made within one day.

7.9.1 Invoke Emergency Procedures Self-Waiver

During the Permit term there was only one emergency that caused a Permittee to invoke Emergency Procedures Self-Waiver. The source was potable water, but the discharge was not dechlorinated and had the potential to mobilize pollutants. Self-Waivers invoked are reported here.

Table 7-3 Summary of Emergency Procedures

Summary of Emergency Procedures		
Permittee	Date Emergency	Description
Oxnard	9/15/2011	Main water line break at Perkins Road and Hueneme Road.

7.10 TRAINING – PA8

Training is important for the implementation of the Public Agency Activities Program Element. An effective training program is one of the best pollution prevention BMPs that can be implemented because it prompts behavioral changes that are fundamentally necessary to protect water quality.

Each Permittee targets staff based on the type of stormwater quality and pollution issues they typically encounter during the performance of their regular maintenance activities. Targeted staff included those who perform activities in the following areas: stormwater maintenance, drainage and flood control systems, streets and roads, parks and public landscaping, and corporation yards.

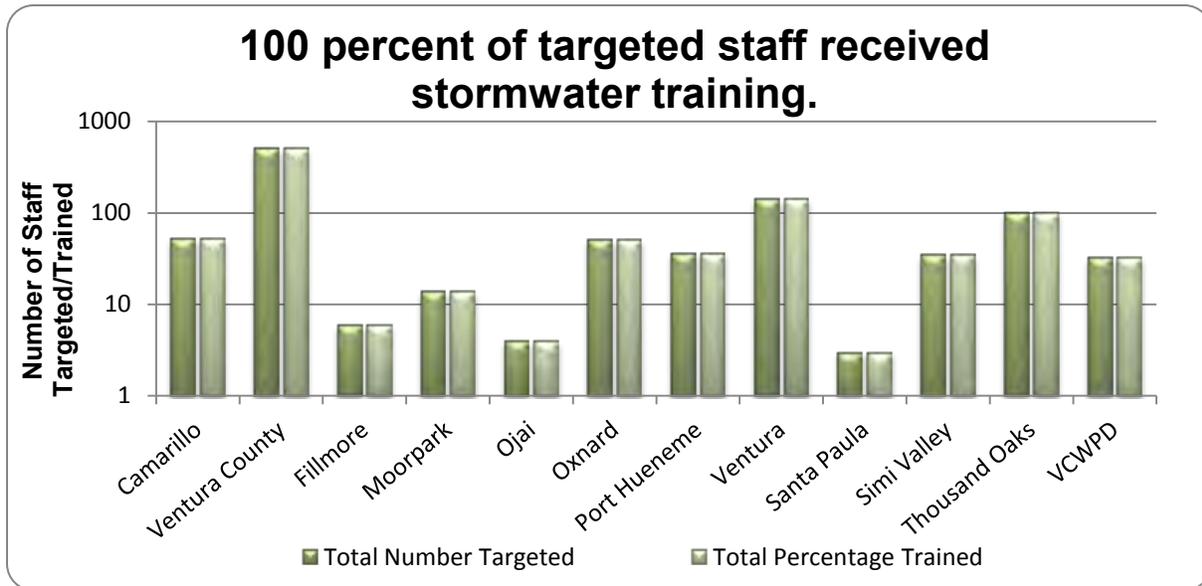
Performance Standard 7-15

Provide training, or ensure that contractors were trained, whose interactions, and activities affect stormwater quality			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Training methods vary among Permittees and range from informal meetings to formal classroom training to self-guided training materials. The Permittees also train staff on the prevention, detection, and investigation of illicit discharges and illegal connections (IC/ID). (See Section 8 for more information regarding IC/ID training).

The Permittees provide training for contractors, or in some cases where contractors are hired for their expertise, to ensure that contractors hired had the required training, whose interactions, jobs, and activities affect stormwater quality. Not all employees receive the same training as certain positions require special focus, such as key staff that use or have the potential to use pesticides or fertilizers.

Figure 7-11 Public Agency Training



Performance Standard 7-16

Provide training for contractors who use or have the potential to use pesticides or fertilizers, or ensure that contractors were trained.			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 7-17

Provide training for key staff that use or have the potential to use pesticides or fertilizers.			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Table 7-4 Areas of Focus for the Public Agency Activities Program Element Training

Target Audience	Subject Material
<ul style="list-style-type: none"> • Employees whose interaction, jobs and activities affect stormwater quality. 	<ul style="list-style-type: none"> • Understanding of the potential for activities to pollute stormwater. • Implementation of BMPs.
<ul style="list-style-type: none"> • Employees and contractors who use or have the potential to use pesticides and/or fertilizers 	<ul style="list-style-type: none"> • Potential for pesticide-related surface water toxicity • Proper use, handling, and disposal of pesticides • Least toxic methods of pest prevention and control, including IPM • Reduction of pesticide use
<ul style="list-style-type: none"> • Employees and contractors responsible for the IC/ID program 	<ul style="list-style-type: none"> • Cover the full IC/ID program from identification to enforcement.

7.11 EFFECTIVENESS ASSESSMENT – PA9

Effectiveness assessment is a fundamental component for developing and implementing successful stormwater programs. In order to determine the effectiveness of the Public Agency Activities Program, a comprehensive assessment of the program data is conducted as a part of the annual report. The results of this assessment are used to identify modifications that need to be made to the program. Each year the effectiveness assessment is reviewed and revised as needed.

By conducting these assessments and modifying the program as needed, the Permittees ensure that the iterative process is used as an effective management tool. Due to the types of data collected for the Public Agency Activities Program, current and future assessments will primarily focus on Outcome Levels 1-3.

- Outcome Level 1 (L1) answers the question: Did the Permittees implement the components of the Permit?

- Outcome Level 2 (L2) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly increased the awareness of a target audience?
- Outcome Level 4 (L4) answers the question: Can the Permittees demonstrate that the control measure/performance standard reduced the pollutant load?

The following is an assessment regarding the effectiveness of the Public Agency Program.

7.11.1 Public Construction Activities Management

Require Public Projects to Comply with Planning and Land Development and Construction Program Requirements

Where applicable, all Permittees require publically-owned or operated construction projects to comply with the Planning and Land Development and Construction Program requirements, or adopted standard practices for very small projects. (L1)

Require Development of SWPCP for Projects that Disturb less than 1 Acre

Grading or building permits are not an effective mechanism for identifying or defining small construction projects since they are not granted for public construction projects. Instead, all Permittees have effectively required small public projects to submit a SWPCP that identifies BMPs. (L1)

7.11.2 Vehicle Maintenance/ Material Storage Facilities/ Corporation Yard Management/ Municipal Operations

Implement Required BMPs for Each Facility

As indicated in table 7-2 Permittees have developed and implemented SWPCPs at all corporate yards. Inspections are performed annually and deficiencies are quickly corrected by Facility staff. (L1)

7.11.3 Vehicle and Equipment Wash Areas

Eliminate Wash Water Discharges

The majority of Permittees have successfully eliminated wash water discharges through a variety of options including offsite disposal, disposal to sanitary sewer, and treatment through clarifier. (L1) Discharges will continue to be eliminated as facilities are constructed, redeveloped or replaced.

7.11.4 Landscape, Park and Recreational Facilities Management

Implement IPM Program

The majority of Permittees have a draft IPM program that is consistent with the Permit. Further assessment is being conducted. (L1) (L2)

Maintain and Expand Internal Inventory on Pesticide Use

Permittees have effectively restricted the purchase and use of pesticides and herbicides to staff certified by the California Department of Food and Agriculture. Permittees that contract out for pesticide applications include standard protocols and requirements as a condition of the contract. (L1)

7.11.5 Storm Drain Operation and Management

Implement Storm Drain System Mapping

Since Ventura County's cities are all separated by open space and the MS4 from one city does not discharge to another, the need to integrate the maps into a countywide storm drain map is not as imperative as the need for a Permittee to be able to know what is upstream from any point in their MS4, and where that water will discharge. Given that the priority for the mapping is internal to the agency operating the system, the Permittees were given the autonomy to decide what form of mapping will work best for their needs.

Implement Catch Basin Maintenance Program

Each Permittee has identified criteria and a methodology for catch basin mapping and prioritization. More than 12,000 catch basins were cleaner during the Annual Reporting period. (L1) The Permittees have completed the process of designating and reporting debris removal by prioritization. During 2011/12, Permittees collectively removed more than 250,000 tons of debris from catch basins. (L4)

Install Trash Receptacles

The majority of Permittees have installed trash receptacles in high trash generation areas. Trash receptacles are cleaned out as necessary. (L1)

Install Additional Trash Management Devices

Permittees have begun the implementation of this performance standard. A more detailed assessment will be conducted once the deadline has passed (July 8, 2012).

Trash Management at Public Events

All Permittees have required trash management for any event in the public right-of-way. (L1) (L4)

Implement Storm Drain Maintenance Program

Each Permittee has a program to maintain curb inlet labeling. (L1) Additionally, all Permittees regularly maintain channels, ditches and detention basins. (L1) Implementation of this performance standard removed more than 23,000 tons of debris from channels and ditches and 98,000 tons of debris from detention basins countywide. (L4)

Implement Spill Response Plan

All Permittees maintain a spill response plan. (L1)

Inspect and Maintain Permittee-Owned Treatment Control BMPs

Permittees that own or are authorized to maintain treatment control BMPs have programs to implement an inspection and maintenance program for all Permittee-owned treatment control BMPs, including post-construction treatment control BMPs. (L1)

7.11.6 **Street and Roads Maintenance**

Implement Street Sweeping Program

Permittees have implemented a street sweeping program that at a minimum, targets commercial areas and high trash generation areas twice a month. More than 100,000 curb miles were swept countywide. (L1) (L4)

BMP Implementation Road Reconstruction Projects

All Permittees required BMPs for any road reconstruction project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing. (L1)

7.11.7 **Emergency Procedures**

Invoke Emergency Procedures

One Permittee had an emergency that required Permittees to invoke Emergency Procedures. (L1)

7.11.8 **Training**

Conduct Training

Permittees provided training for 100% of targeted staff. Over 1000 staff were trained on the implementation of BMPs, reduction of pesticide use, and reduction of illicit connections/illicit discharges. (L1)

7.12 PUBLIC AGENCY ACTIVITIES PROGRAM MODIFICATIONS

On an annual basis, the Permittees plan to evaluate the results of the Annual Report, as well as the experience that staff has had in implementing the program, to determine if any additional program modifications are necessary to comply with the Clean Water Act requirement to reduce the discharge of pollutants to the MEP. Any key modifications made to the Public Agency Program Element during the next fiscal year will be reported in the following Annual Report.

8 Illicit Connections and Illicit Discharges Elimination

8.1 OVERVIEW

Illicit connections and illicit discharges (IC/ID) can be concentrated sources of pollutants to municipal storm drain systems. To reduce this source of pollutants the Permittees have developed and implemented programs for the identification and elimination of IC/ID to the MS4. Key components of these programs are public reporting, field screening, incidence response, and enforcement actions.

The Permittees have developed and implemented programs for the identification and elimination of illicit connections and illicit discharges to the municipal separate stormwater sewer system (MS4).

The term “illicit discharges” used in this program is any discharge to the storm drain system that is prohibited under local, state or federal ordinances. The term includes all discharges not composed entirely of stormwater except discharges allowed under an NPDES permit. Examples of illicit discharges include:

- Incidental spills, or disposal of wastes and non-stormwater. These may be intentional, unintentional, or accidental and would typically enter the storm drain system directly through drain inlets, and catch basins;
- Discharges of sanitary sewage due to overflows or leaks;
- Discharges of prohibited non-stormwater other than through an illicit connection. These typically occur as surface runoff from outside the public right-of-way (e.g., area washdown from an industrial site).

Categories of non-stormwater discharges not prohibited (exempted or conditionally exempted) under the Permit are listed below.

- Stream diversions permitted by the State Board
- Natural springs and rising groundwater
- Uncontaminated groundwater infiltration [as defined by 40 CFR 35.2005(20)]
- Flows from riparian habitats of wetlands
- Discharges from potable water sources
- Drains for foundation, footing and crawl drains
- Air conditioning condensate
- Water from crawl space pumps
- Reclaimed and potable landscape irrigation runoff
- Dechlorinated/debrominated swimming pool discharges
- Non-commercial car washing by residents or non-profit organizations
- Sidewalk rinsing
- Pooled stormwater from treatment BMPs

Accidents are inevitable, so it will be impossible to eliminate all illicit discharges. Just as police cannot eliminate all crime in a community, unfortunately, there will always be an element of society that will contribute to the problem. However, through the combined efforts of the public education, business inspection, construction inspection, and illicit discharge programs the preventable acts of willfully using the storm drain system to dispose of waste will be kept to a minimum.

Illicit connections, while sometimes done in error, cannot be considered accidents. An illicit connection to the storm drain system is an undocumented and/or un-permitted physical connection from a facility or

fixture to the storm drain system. Finding and eliminating illicit connections requires ongoing investigation and screening efforts.

8.2 CONTROL MEASURES

The Permittees have developed several Control Measures and accompanying performance standards to ensure that the Illicit Discharges/Connections Program requirements found in the Permit are met and information provided for optimizing the Program.

The Illicit Discharges/Connections Program Control Measures are organized the same as in the Permit and consist of the following:

Table 8-1 Control Measures for the Illicit Discharges/Connections Program Element

ID	Control Measure
ID1	Detection of Illicit Discharges and Illicit Connections
ID2	Illicit Discharge and Illicit Connection Response and Elimination
ID3	Training
ID4	Effectiveness Assessment

At the end of this chapter these control measures are evaluated to determine the effectiveness of this program element.

8.3 DETECTION OF ILLICIT CONNECTIONS AND ILLICIT DISCHARGES – ID1

Detection of IC/ID through public awareness, the availability of a public hotline, and conducting illicit connection screening ensures that the IC/ID Program is proactive in identifying and eliminating problematic discharges. This control measure reflects the Permittee’s efforts to detect and eliminate IC/ID and provides several mechanisms for collecting information.

The Permittees have a number of programs supporting the detection of IC/ID. These programs include:

- Industrial and commercial facility site visits (outlined in Section 2: Industrial/Commercial Facilities Program)
- Public education materials (outlined in Section 3: Public Outreach)
- Drainage facility inspection (see Section 5: Public Agency Activities)
- Construction inspections and BMP implementation (outlined in Section 6: Development Construction)
- Water quality monitoring (detailed in Section 9: Monitoring and Reporting Program)

The performance standards for this IC/ID control measure and the activities that have been initiated and/or completed during this reporting period are summarized below.

8.3.1 Public Reporting

The Public Outreach Program control measures (See Section 3) detail the methods by which the Permittees educate the community about stormwater pollution. Part of this outreach is information about

the IC/ID Program and part is reporting of IC/ID when observed. For the first few years, as the Stormwater Program evolved and the public became aware of what was not allowed down storm drains, reports of IC/ID increased; however, for the last six years reports of IC/ID have demonstrated a decreasing trend. Since the public is more aware of IC/ID this decrease likely represents a change in behavior and fewer pollutants are reaching the storm drains.

Since the public are the eyes of the IC/ID program, many illicit discharges are identified through public reporting of the situation. The goal of this component, in tandem with the Public Outreach component, is to educate the public and facilitate public reporting of illicit discharges and illicit connections. The baseline objectives are:

- Implement a program to receive calls from the public regarding potential illicit discharges and illicit connections, communicate and coordinate a timely response, perform all necessary follow up to the complaint, and maintain documentation.
- Provide educational material on non-stormwater discharges and why they are harmful to streams, and oceans and how to report them;
- Target the land development/construction community with educational material and provide workshops on stormwater quality regulations and illicit discharge prevention response; and
- Target the industrial/commercial community with educational material and provide workshops on stormwater quality regulations and illicit discharge prevention and response.

Table 8-2 Permittee Hotlines

Permittee	Hotline
Camarillo	(805) 388-5338
County of Ventura Unincorporated Area	(805) 650-4064
Fillmore	(805) 524-3701
Moorpark	(805) 517-6257
Ojai	(805) 640-2560
Oxnard	(805) 488-3517
Port Hueneme	(805) 986-6507
Santa Paula	(805) 933-4212
Simi Valley	(805) 583-6400
Thousand Oaks	(805) 449-2400
Ventura	(805) 667-6510
VC EHD Sewage/wastewater discharges	(805) 654-2813
VC EHD Hazardous waste and material discharges	(805) 654-2813
VC PWA Transportation	(805) 672-2131
VC WPD O&M	(805) 650-4064
VC WPD Permit Section	(805) 650-4064

8.3.2 Publication of IC/ID Program Procedures

As part of the IC/ID outreach effort, the Permittees have documented their IC/ID Program through past Annual Reports which are available for public review at the Program’s web site (www.vcstormwater.org). This is one means by which interested individuals can educate themselves on what constitutes IC/ID and how to report it. More directly, however, the program promotes the reporting of illicit discharges through the Public Information and Public Participation Program.

8.3.3 Public Reporting

Public reporting is one of the most important ways that the public can help prevent the discharge of pollutants from IC/ID. Each Permittee has identified staff serving as the contact person(s) for public reporting of IC/ID, as discussed further in Public Outreach Control Measures (See Section 3). As required by the Permit Permittees maintain a phone hotline to receive reports of IC/ID. Due to the need for timely response to illicit discharges by

inspectors the web sites direct people to report by telephone to a “live person” instead of through email which, while quickly delivered, may not be read within the short time frame that a discharge is occurring.

The Program maintains a website that contains the phone numbers for all the Permittees. This information is updated as necessary and, as required in the Permit, published in the government pages of the local phone book and other appropriate locations. A list of hotlines are presented in Table 8-2 .

Timely responses to reports of illicit discharges are necessary to have the opportunity to determine the source, identify the responsible party, and have them initiate any cleanup to reduce pollutants from such discharge to the MEP. The baseline objectives include:

- Initiate response within 24 hours of receiving a report of discharge from the public, other agencies or observed by a Permittee field staff during the course of their normal daily activities;
- Investigate to determine the nature and source of discharge and eliminate through voluntary termination (when possible) or enforcement action; and
- Educate identified responsible parties and initiate clean up and enforcement actions as necessary.

Performance Standard 8-1

Document the procedures of the ID/IC Program and make them available for public review			
	Yes	No	N/A
Camarillo			
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-2

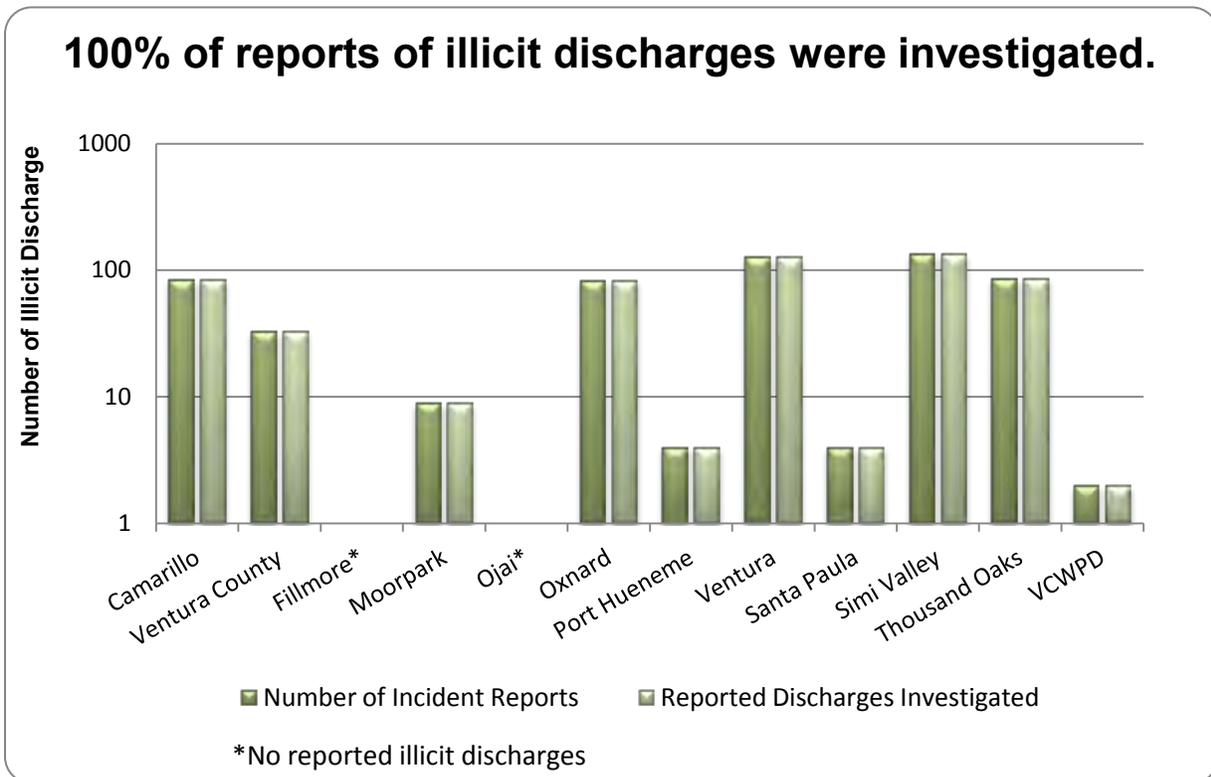
Maintain a phone hotline to receive reports of ID/IC			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-3

Maintain a web site to receive/direct reports of ID/IC			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley			
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

While the goal is to respond within 24 hours, most reports of illicit discharges are responded to within a few hours. Some Permittees have prioritized problem areas (geographical and/or activity-related) for increased inspections using the methods defined in the program. All illicit discharges reported by the public and found through the results of inspections are presented in Figure 8-1.

Figure 8-1 Illicit Discharge Investigations



8.3.4 IC/ID Tracking

Tracking the location of illicit connections and illicit discharge, aside from being a Permit requirement is assumed to assist the Program’s efforts understanding which land uses, age of neighborhood or other potential identifier is common to the problem of illicit discharges and connections. That knowledge could be useful in the future as the Public Outreach and Business Inspections programs continue to evolve.

Performance Standard 8-4

Keep records of all illicit discharge discoveries, reports, responses, and formal enforcement			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Mapping of Known Connections to Storm Drain System

The benefit of mapping all storm drain connections is to allow the Permittees the ability to know the upstream location of an unknown, and conversely what might be possibly affected downstream. This is required in the Permit by May 7, 2012. Since the storm drain system includes all streets and gutters, literally mapping all known connections would include every driveway and property that drains to a street. Since an endeavor of that scale would be resource intensive and with an end product that will lack practical usability, the Permittees have looked to the Regional Board for clarification of the requirement. In the response to comments on this topic the Regional Board provided the following statement: “*Known connections in the Order refer to permitted below grade*”



Mapping connections in the field

connections whose locations are likely already known to Permittees. Staff agrees that mapping may reveal additional connections, but those are likely to be un-permitted.” This guidance creates a manageable effort and ultimately a useful product that will increase the Permittees ability to respond to IC/IDs.

Mapping Illicit Connection and Discharge Incidents

The Permit requires the mapping of all incidents of illicit connections and illicit discharges to their storm drain system since January 2009 by May 7, 2012 at a scale and in a format specified by the Principal Permittee.

Using this requirement to identify priority areas for further investigation and elimination of IC/ID, the Permittees mapped all known connections to their storm drain system and all IC/ID incidents by July 8, 2012, outside of the reporting period for this report. While no obvious hotspots jumped out while reviewing the maps, the discharges were plotted on GIS and compared to other data layers to identify any consistent correlations that could be used to focus resources to prevent illicit discharges before they contribute to stormwater pollution. Figures 8-3 shows the illicit discharges by land use. Residential areas by far have the highest number of illicit discharges, but they are also the largest areas of the cities. When normalized for area commercial land uses become the major source of illicit discharges. This was not a surprise to the Permittees. By their nature commercial areas have lots of activity and high visibility, discharges in those areas have a high chance of being reported by residents or neighbors who do not want the mess near their business. Overall nothing new was learned about illicit discharges through the mapping exercise. The Permittees have learned through experience which areas have problems with illicit discharges, and have strong inspection programs to prevent them.

Figure 8-2

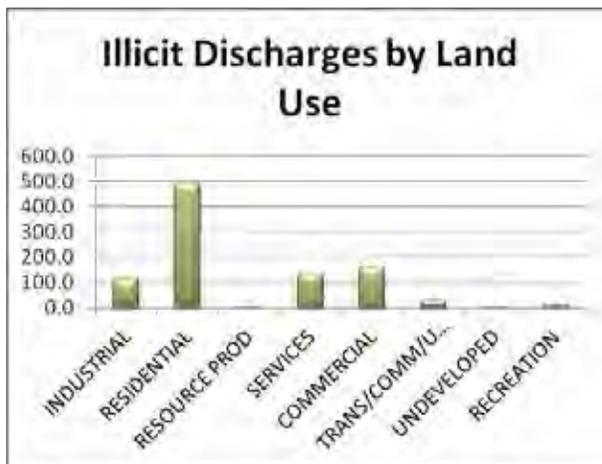
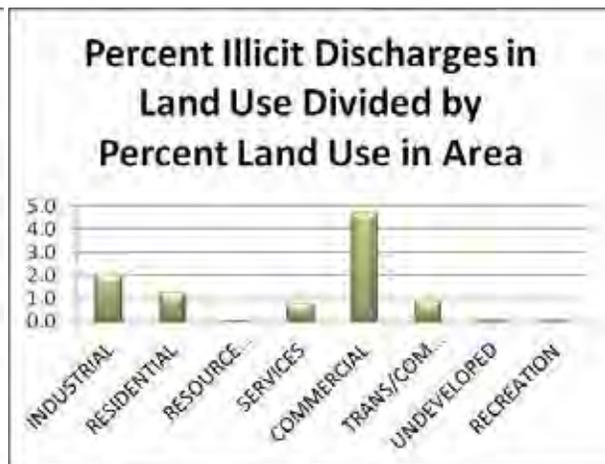


Figure 8-3



8.3.5 Screening for Illicit Connections

Inspections of infrastructure can detect and eliminate illicit connections to the MS4 and reduce pollutants discharged through such connections to the MEP. The objectives of illicit connections screening are to:

- Inspect the storm drain system to identify illicit connections during scheduled infrastructure maintenance by personnel

- Investigate and determine the origin and nature of the discharge when connections to the storm drain system are suspected or observed to be a source of an illicit discharge

Mapping of Storm Drain System

Similar to mapping requirements of known connections to the storm drain system the Permit requires mapping of the entire system in a phased approach outlined below.

- Map all channeled portions of the storm drain system by October 6, 2010
- Map all portions of the storm drain system consisting of pipes 36 inches in diameter or greater by May 7, 2012
- Map of all portions of the storm drain system consisting of pipes 18 inches in diameter or greater by May 7, 2014

Performance Standard 8-5

Submit a map of all channeled portions of the storm drain system in a uniform format			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-6

Submit to the Principal permitted a map of all portions of the storm drain system consisting of pipes 36 inches in diameter or greater in a uniform format			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore		<input checked="" type="checkbox"/>	
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-7

Submit map of all portions of the storm drain system consisting of pipes 18 inches in diameter or greater in a uniform format? (Due by May 7, 2014)			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore		<input checked="" type="checkbox"/>	
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

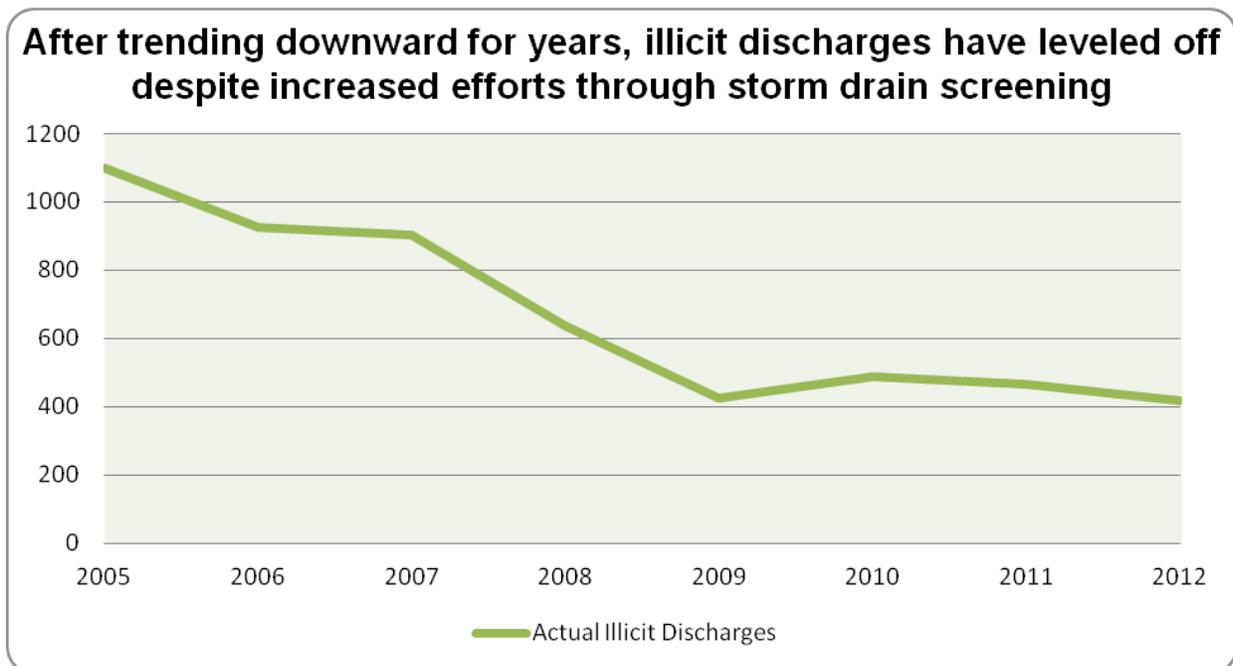
To assist in screening for illicit connections, the Permittees have mapped channels within their permitted area and the storm drain system. These maps were transmitted to the Principal Permittee and are in the process of being incorporated into the Watershed Protection District's GIS system. This incorporation may be as simple as having scanned drawings available through the GIS system when no true GIS data exists. Maps depicting the storm drain system consisting were completed by May 7, 2012 and those 18 inches or greater will be completed by May 7, 2014.

Field Screening

The Permittees have developed an IC/ID Field Screening Protocol using the guidance from the “Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments”². This document is included as Attachment D and suggests that field screening consist of:

- Progressive sampling of manholes to isolate IC/ID to specific sections of the storm drain system (e.g., sampling progressively up the storm drain trunk from an outfall)
- Based on a specific indicator in IC/ID and land use of drainage area, survey of suspected generating sites within the drainage area and on-site testing (e.g., based on sudsy discharge and commercial drainage area, investigation of drainage area to identify laundromats and conduct on-site testing would be warranted)
- Tracking ID/IC to a pipe section of the storm drain system through video or smoke testing.
- Septic system inspections through homeowner surveys, surface inspections, or infrared photography (e.g., Inspect area above septic system for foul odors, wet ground)

Figure 8-4 Illicit Discharge Trends



²*Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments*. The Center for Watershed Protection, Pitt R., October 2004. Chapter 13, 13.1,13.2, 13.3, 13.4

As discussed previously in this section, the Permittees have begun to map the storm drain system in order to identify high priority areas for inspection. The Permittees inspected the storm drain system based on these maps, and report illicit connections to the Regional Water Board. The screening effort did not identify a high number of illicit discharges, this can be seen in Figure 8-4 that displays the trend of actual illicit discharges countywide. The reduction seen in illicit discharges can be seen as a change of behavior as the public gains knowledge of stormwater pollution. The field screening may have identified a few discharges, but public reporting remains the most efficient way to identify them. The requirements for screening were during the reporting period and are outlined below.

- Screen all portions of the storm drain system consisting of pipes 36 inches in diameter or greater by May 7, 2012
- Screen all high priority areas identified during the mapping of illicit connections and discharges by May 7, 2012
- Screen all portions of the storm drain system 50 years of age or older by May 7, 2012

Performance Standard 8-8

Screening of all portions of the storm drain system 50 years of age or older			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore		<input checked="" type="checkbox"/>	
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula			<input checked="" type="checkbox"/>
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-9

Screening of all high priority areas identified during the mapping of illicit connections and discharges			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore		<input checked="" type="checkbox"/>	
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula			<input checked="" type="checkbox"/>
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-10

Submit to the Principal permitted a map of all portions of the storm drain system consisting of pipes 36 inches in diameter or greater in a uniform format			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore		<input checked="" type="checkbox"/>	
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme		<input checked="" type="checkbox"/>	
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

8.4 ILLICIT DISCHARGE/CONNECTION INVESTIGATION AND ELIMINATION – ID2

Timely investigations of reports of IC/ID are necessary to have the opportunity to determine the source, identify the responsible party and initiate any cleanup to reduce pollutants from such discharge to the MEP. This reporting year, the Permittees continued to:

- Investigate the cause, determine the nature, and estimate the amount of discharge for each reported illicit discharge/dumping incident;
- Determine when possible the type of materials and source type for each reported illicit discharge/dumping incidents;
- Determine when possible the probable cause for the illicit discharge/dumping;
- Conduct enforcement or educational activities to prevent similar discharges from reoccurring;
- Verify that reported illicit discharge/dumping incidents were terminated and/or cleaned up;
- Refer illicit discharge/dumping or illicit connections to other agencies when appropriate;
- Identify and eliminate illicit connections;
- Provide educational materials and contact numbers for reporting illicit discharge/dumping when conducting stormwater inspections.

Performance Standard 8-11

Respond within 1 business day of discovery or report of a suspected illicit discharge and abate, contain, and/or cleanup the discharge			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Performance Standard 8-12

Investigate illicit discharges during or immediately following containment and cleanup activities			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

8.4.1 Legal authority

Although adequate legal authority existed for most potential pollutant discharges at the inception of the stormwater program in 1994, the Permittees determined for the first stormwater ordinance a Model Stormwater Quality Ordinance should be developed to provide a more uniform countywide approach and to provide a legal underpinning to the entire Ventura Countywide NPDES Stormwater Program.

Subsequently, all of the Permittees adopted largely similar versions of the model Stormwater Quality Ordinance. In addition, each Permittee has designated Authorized Inspector(s) responsible for enforcing the Ordinance. The Authorized Inspector(s) is the person designated to investigate compliance with, detect violations of and/or take actions pursuant to the Ordinance. These ordinances prohibit un-permitted discharges, and provide the Permittees with legal standing and legal authority to prevent and remove

illicit connections and illicit discharges. A Stormwater Quality Ordinance has been adopted in each Permittees' jurisdictions as indicated in Table 8-3.

Performance Standard 8-13

Take appropriate enforcement action to eliminate the illicit discharge			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai			<input checked="" type="checkbox"/>
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Table 8-3 Ordinance Adoption Dates

Ordinance Adoption Dates		
Co-permittee	Adopted Date	Amendment Date
Camarillo	3/11/1998	In Progress
County of Ventura	10/2/2001	7/17/2012
Fillmore	7/8/2012	7/8/2012
Moorpark	12/3/1997	2008
Ojai	2/9/1999	
Oxnard	3/24/1998	3/24/2009
Port Hueneme	4/1/1998	2/1/2001
San Buenaventura	1/11/1999	In Progress
Santa Paula	11/16/1998	2010
Simi Valley	7/2/2012	
Thousand Oaks	10/14/1999	

The Permittees are aware that further ordinance revisions will be needed and are working together to identify the needed amendments and draft an adoptable ordinance by the July 8, 2012 due date.

Performance Standard 8-14

Legal authority to prevent and remove illicit connections and illicit discharges			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme	<input checked="" type="checkbox"/>		
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

8.4.2 Response to Illicit Connections

Investigation

Each Permittee detects and eliminates illicit connections within its municipal storm drain system. Any illicit connection identified by the Permittees during routine inspections or reported by a third party is investigated. Appropriate actions are then taken to approve undocumented connections by permit procedure or pursue removal of those connections determined to be illicit connections and therefore not permissible.

Performance Standard 8-15

Maintain a list of all connections under investigation for possible illicit connection and their status			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

If the discharge from an identified connection is determined to consist only of stormwater or exempted non-stormwater, the connection will be allowed to remain and will no longer be considered an illicit connection. Permittees may elect to issue a permit for the connection or allow the connection to remain if information on the connection is documented; or the discharge will be permitted through a separate NPDES permit; if not the connection will be terminated through voluntary action or enforcement proceedings.

Screening has been implemented by the Permittees and has proven to be a very labor intensive effort resulting in very few suspect connections turning out to be illicit connections that need to be terminated. Of the 139 possible illicit

connections only 26 were identified as actual unpermitted illicit connections, and as of this report 4 were terminated. Termination or formal enforcement of illicit connections must occur within 180 days.

Each of the Permittee also maintains a record of all connections currently under investigation for possible illicit discharge and tracks their status.

Performance Standard 8-16

Complete investigation of reports of illicit connections to determine the source, nature, and volume of the discharge as well as the responsible party within 21 days			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

The response time to an illicit connection is included in the Permittees' IC/ID database and does not exceed 21 days. The source, nature, and type of discharges from these connections as well as the responsible party are also documented in the Permittees' IC/ID database. Summary statistics of the source of the illicit discharge from these connections is grouped with all other illicit discharges.

Performance Standard 8-17

Terminate the connection using formal enforcement within 180 days of completion of the investigation			
	Yes	No	In Progress
Camarillo	<input checked="" type="checkbox"/>		
Ventura County			<input checked="" type="checkbox"/>
Fillmore		<input checked="" type="checkbox"/>	
Moorpark	<input checked="" type="checkbox"/>		
Ojai		<input checked="" type="checkbox"/>	
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula		<input checked="" type="checkbox"/>	
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Termination

The Permit requires the connection be terminated within 180 days of completion of the investigation. Upon confirmation of an illicit connection, the Permittees terminate the connection using formal enforcement within 180 days of completion of the investigation.

Performance Standard 8-18

Documentation

The Permittees' IC/ID database documents the time by which the illicit connection is terminated. Owners of existing drains without appropriate permits (including encroachment permits) are notified to comply. For those drains where the owner is unresponsive or cannot be identified, each Permittee is responsible for deciding whether to formally accept the connection as part of their public drainage system or cap it off.

Keep records of all illicit connection investigations and formal actions taken to eliminate all illicit connections			
	Yes	No	N/A
Camarillo	<input checked="" type="checkbox"/>		
Ventura County	<input checked="" type="checkbox"/>		
Fillmore	<input checked="" type="checkbox"/>		
Moorpark	<input checked="" type="checkbox"/>		
Ojai	<input checked="" type="checkbox"/>		
Oxnard	<input checked="" type="checkbox"/>		
Port Hueneme			<input checked="" type="checkbox"/>
Ventura	<input checked="" type="checkbox"/>		
Santa Paula	<input checked="" type="checkbox"/>		
Simi Valley	<input checked="" type="checkbox"/>		
Thousand Oaks	<input checked="" type="checkbox"/>		
Watershed Protection	<input checked="" type="checkbox"/>		

Upon receipt of a complaint, the Permittees investigate the source and nature of the IC/ID with the goals of:

- Eliminating the IC/ID through voluntary termination or enforcement action (when possible)
- Educating identified responsible parties and initiating enforcement actions as necessary

Investigation and Cleanup

Timely responses to reports of illicit discharges are necessary to have the opportunity to determine the source, identify the responsible party and initiate any necessary cleanup to reduce pollutants from such discharge to the MEP. The baseline objectives include:

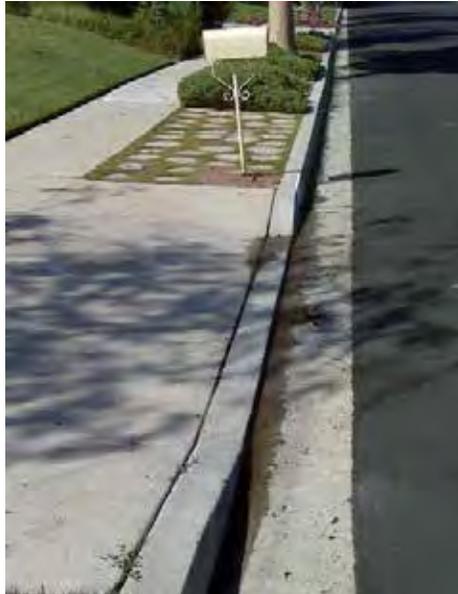
- Initiate response within 24 hours of receiving a report of discharge from the public, other agencies or observed by a Permittee field staff during the course of their normal daily activities;
- Investigate to determine the nature and source of discharge and eliminate through voluntary termination (when possible) or enforcement action; and

- Educate identified responsible parties and initiate enforcement actions as necessary.

While the goal is to respond within 24 hours, most reports of illicit discharge are responded to within a



Evidence of an illicit discharge



Pollutants removed after cleanup

few hours. Some Permittees have prioritized problem areas (geographical and/or activity-related) for inspection, cleanup and enforcement using the methods defined in the program. In the normal course of an investigation the responsible party will be directed to perform any possible clean-up. 100% of illicit discharges were investigated and 100% of confirmed illicit discharges were resolved.

The discovery of potential or likely illicit discharges through business inspections has worked to reduce the number of overall illicit discharges. Inspections of infrastructure can also detect and eliminate illicit connections to the MS4 and reduce pollutants discharged through such connections to the MEP. The baseline objectives include:

- Inspect the storm drain system to identify illicit connections during scheduled infrastructure maintenance by personnel
- Connections to the storm drain system that are suspected or observed to be a source of an illicit discharge will be investigated to determine the origin and nature of the discharge
- Use business inspections to identify and resolve potential illicit discharges and illicit connections; and
- Educate the business community on the environmental and legal consequences of illicit discharges.

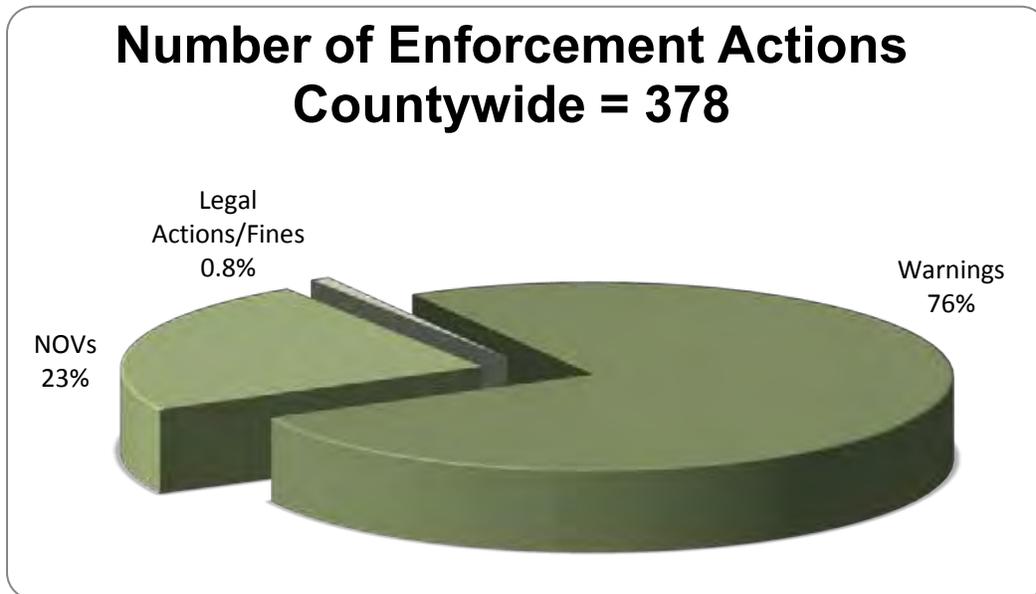
While the goal is to respond to illicit discharges reports within 24 hours, most reports are responded to within a few hours.

Enforcement

Permittees continue to implement enforcement procedures to eliminate illicit discharges and illicit connections available through their legal authority of their respective ordinances. Most enforcement processes follow a common sequence. These typically include:

- Verbal or written warnings for minor violation
- Formal notice of violation or non-compliance with compliance actions and time frames
- Cease and desist or similar order to comply
- Specific remedies such as civil penalties (e.g., infraction), non-voluntary termination with cost recovery, referral for criminal penalties, or further legal action
- Authority to issue civil citations of \$100 on site

Figure 8-5 Enforcement Actions Countywide



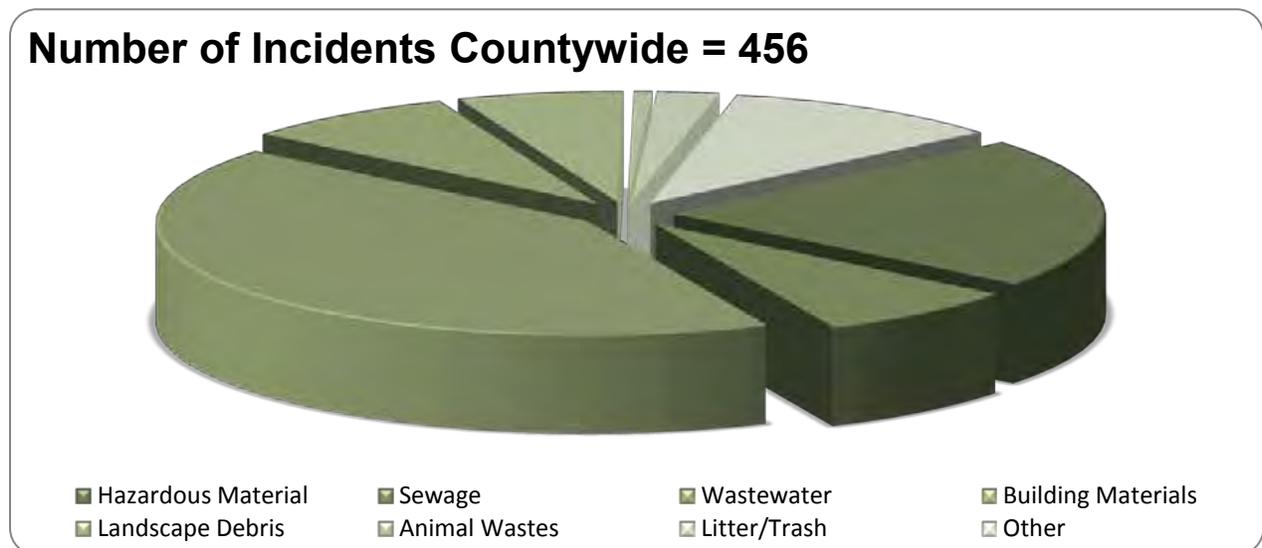
Every time a responsible party is identified for an illicit discharge there is an opportunity for education and enforcement. Enforcement activity begins at the appropriate level as determined by the Permittees' authorized representative. For incidents more severe or threatening at the onset, enforcement starts at an increased level. Often times a verbal warning and requiring cleanup of the discharge is effective, if necessary the Permittee will charge the responsible party for cleanup services provided. Enforcement steps are accelerated if there is evidence of a clear failure to act or an increase in the severity of the discharge. Enforcement actions for violating any of the provisions of the Permittees' ordinances may include any of the following or a combination thereof:

- Criminal Penalties
- Monetary punishment
- Imprisonment
- Civil Penalties

Education of targeted audiences occurs through inspections of illicit discharges, businesses, and construction activities. The importance of eliminating or mitigating non-stormwater discharges to local streams and channels is emphasized.

The capacity to issue civil citations has been added to the City of Oxnard’s enforcement plan to ensure that repeat violators of local, state, and federal stormwater quality regulations are assessed a fine for their illicit (illegal) activities. The integration of this enforcement action allows the municipality to assess a \$100.00 fee for those individuals or entities that receive a notice of violation (NOV) and thereafter again engage in the same illicit discharge activity. An additional \$100.00 fine is assessed, per day and per violation, if a repeat violation is committed within a thirty (30) day period. If, after thirty (30) days, the same party is once again engaging in similar illicit activities then a \$200.00 citation is given. A \$500.00 fine is issued to third time participants of an illicit discharge committed within sixty (60) days after the initial citation. Since current City policy allows the Mayor to delegate the authority to issue civil citations to designated employees, no changes to the City’s stormwater ordinance were necessary. The only prerequisite imposed on these employees was that they receive training on civil citation writing from the City of Oxnard Code Enforcement Unit. Simply having the ability, and threat, to issue a civil citation has proven to be enough of a deterrent to discourage/eliminate future occurrences of the same type of illicit activities from the local residents and the construction/building communities.

Figure 8-6 Illicit Discharges Incidents



Documentation

Permittees keep records of all illicit discharge discoveries, reports, responses, and enforcement and track the efforts during the permit term in the Permittees' IC/ID database and summarized in the figures below.

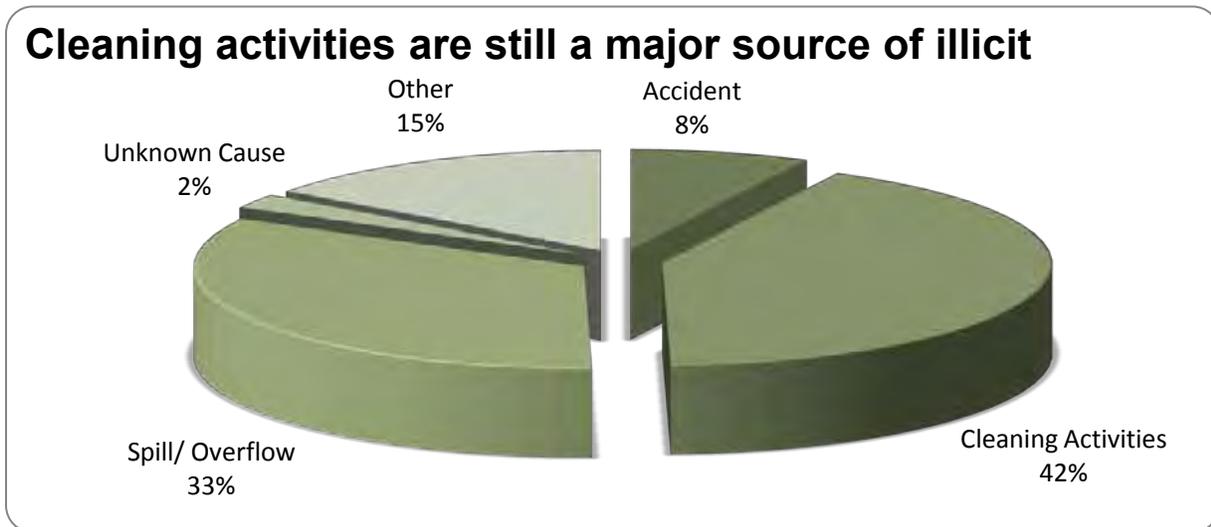
As part of their field investigation of reported illicit discharges/dumping incidents, the Permittees attempt to determine the material's source. This investigation begins at the surface drainage system in the vicinity of suspected illicit discharges. This may include accessible areas in the public right-of-way adjacent to residences and businesses, catch basins, open channels near known points of discharge, and upstream manholes. If the source and responsible party can be determined, Permittees take one, or all, of the following actions when appropriate:

- Voluntary cleanup/termination;
- Initiate enforcement procedures;
- Take steps to prevent similar discharges from reoccurring.

When the source cannot be determined, the appropriate municipal department, or a contractor, will be notified to contain and clean up the material. Because these situations and materials can vary, procedures vary as well. In general, the following are steps that are taken by Permittees to determine sources:

- Verify location of the spill/discharge;
- Containment and cleanup;
- Investigate the cause (look for origin);
- Determine the nature and estimate the amount of illicit discharge/dumped material;
- When appropriate, refer documented non-stormwater discharges/dumping or illegal connections to the proper agency for investigation; and
- If appropriate, notify the RWQCB and/other proper agencies.

Figure 8-7 Sources of Illicit Discharges



8.5 TRAINING – ID3

The Training Control Measure is important for the implementation of the IC/ID Program Element. An effective training program is one of the best pollution prevention BMPs that can be implemented because it prompts behavioral changes that are fundamentally necessary to protect water quality. The Permittees evaluate the efficacy of the training modules they offer by conducting pre- and post-training surveys used to assess a trainee’s command of a topic before and after receiving training on the subject.

8.5.1 Conduct Training

Each Permittee targets staff based on the type of stormwater quality and pollution issues they may encounter. Targeted staff included illicit discharge inspectors, drainage, roadway, landscape and facilities staff, industrial pretreatment inspectors and code enforcement officers. Training is incorporated with existing business inspection, construction site, and public agency activity programs.

Staff is trained in a manner that provides adequate knowledge for effective illicit discharge identification, investigation, reporting and/or clean up. Training was achieved in a variety of ways, including informal “tailgate” meetings, formal classroom training and/or self-guided training methods. During this reporting period, Permittees trained 310 municipal staff on illicit discharge response and non-stormwater discharges. The staff trained by the Permittees is presented in figure 8-8 and training program is outlined in Table 8-4

Figure 8-8 Illicit Discharge and Illicit Connection Training



Table 8-4 Training Areas of Focus for the ID/IC Program Element

Target Audience	Format	Subject Material	Comments
<ul style="list-style-type: none"> • Illicit discharge inspectors • Drainage, roadway, landscape, and facilities staff • Industrial pretreatment inspectors • Code enforcement officers 	<ul style="list-style-type: none"> • Classroom • On-site 	<ul style="list-style-type: none"> • Identification • Investigation • Termination • Cleanup • Reporting of incidents • Documentation of incidents 	<ul style="list-style-type: none"> • Training seminars or workshops related to the program may be made available by other organizations

8.6 EFFECTIVENESS ASSESSMENT – ID4

Effectiveness assessment is a fundamental component required for the development and implementation of a successful stormwater program. In order to determine the effectiveness of the IC/ID Program Element, a comprehensive assessment of the program data is conducted as part of the Annual Report. The results of this assessment are used to identify modifications that need to be made to the Program Element. Each year the effectiveness assessment is reviewed and revised as necessary.

By conducting these assessments and modifying the Program Element as needed, the Permittees ensure the iterative process is used as an effective management tool. Due to the types of data collected for the IC/ID Program, current and future assessments will primarily focus on Outcome Levels 1 through 4.

- Outcome Level 1 (L1) answers the question: Did the Permittees implement the components of the Permit?
- Outcome Level 2 (L2) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly increased the awareness of its target audience?
- Outcome Level 3 (L3) answers the question: Can the Permittees demonstrate that the control measure/performance standard significantly modified the behavior of a target audience?
- Outcome Level 4 (L4) answers the question: Can the Permittees demonstrate that the control measure/performance standard reduced the pollutant load?

The Permittees have effectively implemented an IC/ID program as described in the following sections. Past Annual Reports have documented the program and are available for public review at the Program's website.³ (L1)

8.6.1 Detection of Illicit Connections and Illicit Discharges Public Outreach Implementation

Public Reporting

Each Permittee has identified staff serving as the contact person(s) for public reporting of IC/ID. The majority of the Permittees maintain a phone hotline to receive IC/ID complaints. (L1) Due to the need for timely response to illicit discharges Permittee web sites direct people to report by telephone to a "live person" instead of through email which, while quickly delivered, may not be read within the short time frame that a discharge is occurring. The Program maintains a website that contains the phone numbers for all the Permittees. (L1)

- For the first few years, as the Stormwater Program evolved and the public became more aware of what was not allowed down storm drains, reports of IC/ID increased; however, for the last five years reports of IC/ID have demonstrated a decreasing trend as shown in Figure 8-1. Since the public is more aware of IC/ID this decrease likely represents a change in behavior and fewer pollutants reaching the storm drains. (L3)

IC/ID Tracking

The Permit requires the mapping of all incidents of illicit connections to their storm drain system since January 2009 by May 7, 2012 at a scale and in a format specified by the Principal Permittee. The Permittees have mapped channels within their permitted area and the storm drain system. These maps

³ <http://www.vcstormwater.org>

were transmitted to the Principal Permittee and were incorporated into the Watershed Protection District's GIS system. (L1)

Screening for Illicit Connections

Screening has been implemented by the Permittees and has proven to be a very labor intensive effort resulting in very few suspect connections turning out to be illicit connections that need to be terminated. Of the 139 possible illicit connections only 26 were identified as actual illicit connections, and as of this report 4 were terminated. As illicit connections are terminated it immediately reduces the discharge of pollutants. (L4)

8.6.1 Illicit Connection and Illicit Discharge Response and Elimination

Legal Authority

Legal authority for most potential pollutant discharges has existed since 1994. More recently Permittees recently adopted a stormwater quality ordinance which more effectively and consistently ensured adequate legal authority across permittees. (L1)

Response to Illicit Discharges and Illicit Connections

Each IC/ID complaint and the actions undertaken in response were documented. (L1) The Permittees responded to all reports of illicit discharge within 24 hours and often within a few hours. (L1) Where possible, the Permittees identified the source, nature, and volume of the discharge. Data shows that the source was identified 95% of the time. The Permittees eliminated all known illicit discharges during this fiscal year. (L1) The Permittees took enforcement action as shown in figure 8-5. (L1)

The Permittees have developed an IC/ID Field Screening Protocol using the guidance from the "Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments"⁴ In order to identify high priority areas for inspection, the Permittees have begun to map the storm drain system. (L1) The Permittees investigated all illicit connections identified during inspections or reported by a third party within 21 days. (L1) Where possible, the Permittees determined the source, nature, and volume of the discharge.

8.6.2 Enforcement

Appropriate actions were then taken to approve undocumented connections or pursue removal of illicit connections. Upon confirmation of an illicit connection, the Permittees terminated the connection using formal enforcement within 180 days. (L1) (L4) Some of the Permittees maintained a list containing all connections under investigation for possible illicit connection and their status. (L1) The Permittees eliminated all known illicit connections during this reporting year. (L1)

⁴*Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments*. The Center for Watershed Protection, Pitt R., October 2004. Chapter 13, 13.1,13.2, 13.3, 13.4

8.6.3 Training

Conduct Training

During this reporting year, the Permittees trained a total of 310 municipal staff members. Each Permittee targets staff based on the type of stormwater quality and pollution issues they may encounter. Targeted staff included illicit discharge inspectors, drainage, roadway, landscape and facilities staff, industrial pretreatment inspectors, and code enforcement officers. This permitting year 100% of targeted staff members were trained. (L1)

8.6.4 Illicit Discharges and Illicit Connections Program Element Modifications

On an annual basis, the Permittees evaluate the results of the Annual Report, as well as the experience that staff has had in implementing the program, to determine if any additional program modifications are necessary to comply with the Clean Water Act requirement to reduce the discharge of pollutants to the maximum extent practicable.

9 Water Quality Monitoring

9.1 OVERVIEW

As required by Order R4-2010-0108 (issued July 8, 2010), the Ventura Countywide Stormwater Quality Management Program successfully monitored water chemistry, toxicity and biological communities of creeks, rivers, and channels within Ventura County during the 2011/12 monitoring season.

Monitoring locations for water chemistry and toxicity included Mass Emission stations and Major Outfall stations. Mass Emission stations are located in the lower reaches of the three major watersheds in Ventura County (Ventura River, Santa Clara River, and Calleguas Creek). Major Outfall stations, a component of the Stormwater Monitoring Program since 2009, are located in subwatersheds representative of each particular Permittee's contribution to downstream waters.

Water chemistry samples were collected at Mass Emission and Major Outfall stations during three rainfall events, with each site sampled once per event. The rain events occurred on October 5, 2011 (all sites), January 21, 2012 (all sites), and March 17, 2012 (all sites). Samples were collected at Mass Emission and Major Outfall stations during one dry event which was split into three days: April 23, 2012 (MO-MEI, MO-OJA, and MO-MEI), May 21, 2012 (ME-SCR, MO-FIL, MO-OXN, and MO-VEN) and May 23, 2012 (ME-CC, MO-CAM, MO-SIM, MO-THO, and MO-HUE). Note: dry event samples were not collected at MO-SPA or MO-MPK due to lack of flow. Toxicity samples were collected during the first wet event of the season for all fourteen sites. A smaller subset of water chemistry samples was collected at each of the Major Outfall stations (or similar alternate location if no flow was observed) on August 15, 2012, and August 16, 2012, as part of the dry -season, dry-weather monitoring prescribed in the NPDES permit.

Through rigorous adherence to the Stormwater Monitoring Program's sampling protocols and through selection of a high-quality analytical laboratory, the Stormwater Monitoring Program was able to achieve a 91.8% success rate in meeting program data quality objectives.

This year the Ventura Countywide Stormwater Quality Management Program re-evaluated and modified its application of the California Toxics Rule (CTR) Numeric Criteria for Priority Toxic Pollutants to determine water quality exceedances in receiving waters. The driver for this change was the inconsistent application of acute and chronic criteria in the past. The new approach provides more consistent protection of beneficial uses and is more consistent with how other stormwater agencies in southern California determine. The details and benefits of the new approach, and the implications for historical exceedances are discussed in this report.

Aluminum, E. coli and fecal coliforms were commonly found at elevated levels at most sites during wet-weather events, but with the exception of E. coli, rarely during dry-weather events. Other constituents that were found at elevated levels during the 2011/12 monitoring season include chloride and total dissolved solids (predominantly during the dry-weather event); dissolved oxygen; dissolved copper; and pH (dry weather). Constituents that were seen at elevated levels at Major Outfalls only once during the season include total chromium, bis(2-ethylhexyl)phthalate, benzo(a)pyrene, and pentachlorophenol. Constituents that were seen at elevated levels at Mass Emission stations only once during the season include the metals (total) barium, cadmium, chromium, and nickel. The Program is using this information to identify pollutants of concern and direct efforts to reduce their discharge from the storm drain system.

Bioassessment sampling was performed at fifteen random [probabilistic (P)] and three targeted [trend (T)] sites throughout Ventura County, divided among each of the three major watersheds (six P and one T in the Ventura

River Watershed, six P and one T in the Calleguas Creek Watershed, and three P and one T in the Santa Clara River Watershed). Sampling was conducted over eight days between June 4, 2012 and July 19, 2012.

The Ventura Countywide Stormwater Quality Management Program started a comprehensive data analysis effort, aiming to identify historical trends in water quality, priority pollutants and their sources to receiving waters. As part of this year's report, the trend analysis results are presented.

9.2 INTRODUCTION

This report summarizes the effort undertaken by the Ventura Countywide Stormwater Quality Management Program (Program) and the Stormwater Monitoring Program during the 2011/12 monitoring season. Pursuant to NPDES Permit No. CAS0040002, the Program must submit a Stormwater Monitoring Report annually by December 15th, and include the following:

- Results of the Stormwater Monitoring Program
- General interpretation of the results
- Tabular and graphical summaries of the monitoring data obtained during the previous year

Analysis of samples collected at various stations throughout the watershed gives an overall representation of the quality of stormwater discharges. The monitoring also aids in the identification of pollutant sources, as well as the assessment of Program effectiveness. Feedback provided by the monitoring program allows for changes to be made in the implementation of other Program aspects in order to resolve any problems and reduce pollutants that may exist. This adaptive management strategy should eventually show improved water quality through the stormwater monitoring program. The Stormwater Monitoring Program includes the following components.

9.2.1 Mass Emission Monitoring

Mass Emission stations are located in the lower reaches of the three major watersheds in Ventura County (Ventura River, Santa Clara River, and Calleguas Creek). As such, the Mass Emission drainage areas are much larger than the drainage areas associated with Major Outfall stations (described in Section 9.2.2), and include large contributions from other sources of discharge, such as wastewater treatment plants, agricultural runoff, non-point sources, and groundwater discharges.

The purpose of mass emission monitoring is to identify pollutant loads to the ocean and identify long-term trends in pollutant concentrations. This type of monitoring, in conjunction with the Major Outfall monitoring, is also useful in helping to determine if the Municipal Separate Storm Sewer System (MS4) is contributing to exceedances of water quality objectives by comparing results to applicable water quality objectives in the Los Angeles Region Water Quality Control Plan (Basin Plan) and the California Toxics Rule (CTR), as described in Section 9.5.1.

During the 2011/2012 monitoring season, water quality samples from three wet-weather events and one dry-weather event were collected for water chemistry analysis at each Mass Emission station, as required by the NPDES permit. Also, aquatic toxicity samples were collected at each Mass Emission station during Event 1 (October 5, 2011) and tested with the species that was determined to be the most sensitive to contaminants for each station, based on the results from the 2009/10 monitoring year. In addition, trend analysis was performed for all constituents using historical data from Mass Emission stations, in order to identify potential improvements or deterioration in chemical water quality since 2001.

9.2.2 Major Outfall Monitoring

The Permit requires sampling at one representative station (major outfall) for each Permittee's municipal separate storm sewer system (MS4). Many of the monitoring requirements for Major Outfall stations are similar to those for the Mass Emission stations, as are the reasons for undertaking this monitoring. Four of the stations were monitored beginning with the 2009/10 monitoring season and seven of the stations were new to the 2010/11 monitoring season. Station selection for these new sampling locations is described in Section 9.3.2.

During the 2011/12 monitoring season, water quality samples from three wet-weather events and one dry-weather event were collected for water chemistry analysis at each of the eleven Major Outfall stations⁵, as required by the NPDES permit. Aquatic toxicity samples were collected at each of the Major Outfall stations during Event 1 (October 5, 2011) and tested with the species that was determined to be the most sensitive to contaminants for that station, based on the results from the 2009/10 or 2010/11 monitoring year, as applicable.

Using the data from the Major Outfall monitoring in conjunction with the Mass Emission monitoring, the Stormwater Monitoring Program will help the Program determine if an MS4 is potentially contributing to exceedances of water quality objectives by comparing results to applicable water quality objectives in the Basin Plan and the CTR. And, over the course of many years, the data will be able to describe trends in waters from the Major Outfall stations over time. This information will be useful in evaluating the effectiveness of the Program implementation and provide Permittees with real data on which to base future management decisions.

9.2.3 Dry-Season, Dry-Weather Analytical Monitoring

The Permit requires the analysis of pollutant discharges from representative MS4 outfalls in each municipality and in the unincorporated County area during dry-weather between May 1 and Sept 30. The Stormwater Monitoring Program met this requirement by sampling once during the summer at or near Major Outfall stations, or at another representative site if flow was insufficient at the Major Outfall station.

9.2.4 Bioassessment Monitoring

Prior to the adoption of the new Orders (No. 09-0057 in 2009 and its replacement, R4-2010-0108 in 2010), the Stormwater Monitoring Program performed bioassessment monitoring in the Ventura River watershed at fixed locations. That sampling effort was terminated in favor of a new program working to standardize bioassessment monitoring throughout Southern California undertaken by the Stormwater Monitoring Coalition of Southern California (SMC) and led by the Southern California Coastal Water Research Project (SCCWRP). The Stormwater Monitoring Program was instructed to participate in this new program by performing sampling at 15 random sites and three targeted sites throughout the County annually, for the duration of the five year study. The sampling for this report year was performed in early summer of 2012.

⁵ With the exception of MO-SPA and MO-MPK which were not sampled during the dry weather event due to a lack of consistent flow.

9.3 MONITORING STATION LOCATIONS AND DESCRIPTIONS

9.3.1 Mass Emission Stations

Mass Emission stations are located in the three major Ventura County watersheds: Ventura River (ME-VR2), Santa Clara River (ME-SCR), and Calleguas Creek (ME-CC). In locating these stations, every effort was made to position the station as low as possible in the watershed to capture as much of the runoff as possible, while still remaining above tidal influence. See Figure 9-1 for the location of Mass Emission stations.

The ME-VR2 station is located at the Ojai Valley Sanitary District's wastewater treatment plant (WWTP) near Canada Larga Road and captures runoff from the city of Ojai, several unincorporated communities (e.g., Meiners Oaks, Casitas Springs), and a large portion of undeveloped landscape, the latter of which comprises the bulk of the watershed. Monitoring at the ME-VR2 station was initiated during the 2004/05 monitoring season after landslide activity at the original Ventura River Mass Emission station, ME-VR, precluded further sampling at that location.

The ME-CC station is located along University Drive near California State University at Channel Islands and captures runoff from the cities of Camarillo, Thousand Oaks, Moorpark and Simi Valley. This watershed has the largest urban influence (roughly 30% urbanized), but also includes significant contributions from agricultural runoff found predominantly in the lower two-thirds of the watershed. Monitoring at the ME-CC station was initiated during the 2000/01 monitoring season.

The ME-SCR station is located at the United Water Conservation District's (UWCD) Freeman Diversion Dam east of Saticoy and captures runoff from the cities of Santa Paula and Fillmore, communities upstream in Los Angeles County, agricultural fields, and a large amount of undeveloped landscape. Monitoring at the ME-SCR station was initiated during the 2001/02 monitoring season. Unlike at the other two Mass Emission stations, accurate measurement of flow at this location is not possible due to the configuration and operation of the diversion structure. In dry conditions, the river is usually diverted to groundwater infiltration ponds. In wet-weather conditions, the Santa Clara River can also flow past the diversion dam through two other routes. One route is through the river diversion gate structure where the majority of wet-weather flow passes. The other route is over the diversion dam, a situation which occurs only during high flows generated by large storm events. Wet-weather flow can only be measured at the diversion dam because there is no flow meter installed at the river diversion gate. There are technical challenges involved with measuring flow at the river diversion gate since floating debris and sediment can interfere with flow measurement and the large fluctuation in water level due to gate operation makes non-contact stage measurement difficult.

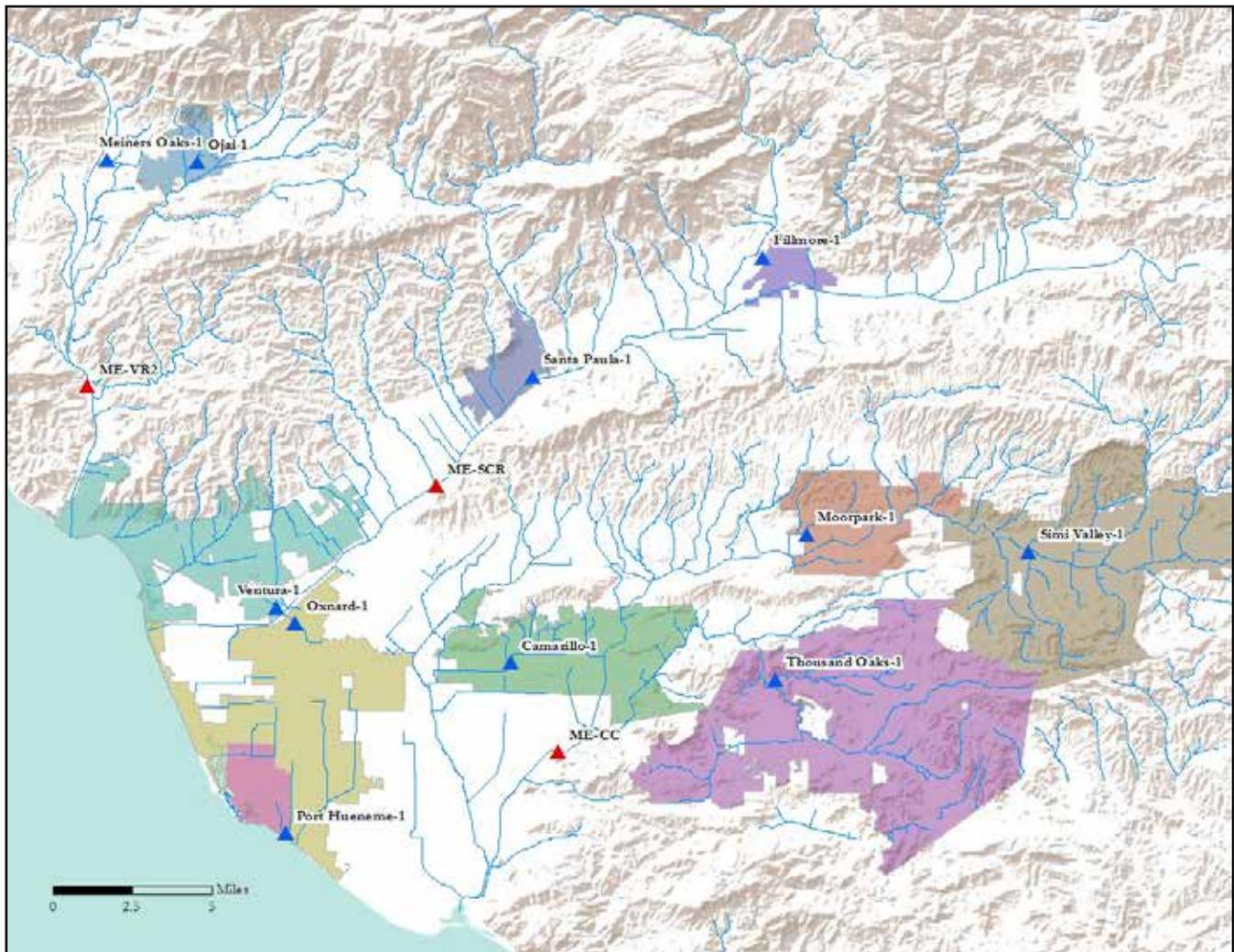
9.3.2 Major Outfall Stations

Of the eleven Major Outfall stations, four were added to the Stormwater Monitoring Program in 2009 and seven were added in 2010. As directed by the NPDES permit, these stations represent the runoff from each city/unincorporated county (Permittee) in which they are located. Municipalities selected for inclusion in the 2009/10 Stormwater Monitoring Program include Camarillo (MO-CAM), Ojai (MO-OJA), unincorporated Meiners Oaks (MO-MEI) and Ventura (MO-VEN).⁶ The stations in the seven remaining municipalities brought

⁶ Site names shown on the map reflect the names given to each site in the NPDES permit; site names throughout this report are shortened to those shown on chains-of-custody (COCs) for brevity. Under this naming convention, MO-CAM is synonymous with Camarillo-1, MO-FIL with Fillmore-1, MO-HUE with Port Hueneme-1, MO-OJA with Ojai-1, MO-OXN with Oxnard-1, MO-MEI with Meiners Oaks-1 (VCUunincorporated-1), MO-MPK with Moorpark-1, MO-SPA with Santa Paula-1, MO-SIM with Simi Valley-1, MO-THO with Thousand Oaks-1, and MO-VEN with Ventura-1.

online for the 2010/11 Stormwater Monitoring Program include Fillmore (MO-FIL), Moorpark (MO-MPK), Oxnard (MO-OXN), Port Hueneme (MO-HUE), Santa Paula (MO-SPA), Simi Valley (MO-SIM), and Thousand Oaks (MO-THO). Details of the land use of each city and the representative watershed can be found in Appendix A in Attachment E.

Figure 9-1 Mass Emission and Major Outfall Sampling Locations



The MO-CAM station is located on Camarillo Hills Drain (a tributary of Revolon Slough) just north of Daily Drive in Camarillo. The predominant land use in the watershed is residential. Less than 8% of the watershed is commercial and less than 1% is agricultural.

The MO-OJA station is located on Fox Canyon Barranca (a tributary of San Antonio Creek) near the Ojai Valley Athletic Club in Ojai. Almost half of the watershed is classified as vacant, with residential land use comprising about 40%. About 3% of the watershed is commercial and about 5% is agricultural.

The MO-MEI station is located on Happy Valley Drain (a tributary of the Ventura River) near Rice Road in Meiners Oaks. Almost half of the watershed is classified as residential. Another quarter of the watershed is classified as vacant. About 3% of the watershed is commercial and about 15% is agricultural.

The MO-VEN station is located on Moon Ditch (a tributary to the Santa Clara River) near the US101-Johnson Drive interchange in Ventura. Over half of the watershed is residential and a quarter is commercial. Industrial land uses account for almost 7% of the watershed, while agriculture comprises less than 1% of the watershed.

The MO-FIL station is located on the North Fillmore Drain (a tributary of Sespe Creek) near Shiells Park in Fillmore. Almost half the watershed is residential and just over a third is classified as vacant. Agriculture land uses account for almost 7% of the watershed, while commercial comprises less than 1% of the watershed.

The MO-MPK station is located on the Gabbert Canyon Drain (a tributary to Arroyo Las Posas) near the intersection of Los Angeles Avenue and Mira Sol Drive. Over half the watershed is classified as vacant, less than 10% of the land is residential, and almost 13% of the watershed is used for agriculture.

The MO-OXN station is located on El Rio Drain (a tributary to the Santa Clara River) near the corner of Buckaroo Avenue and Winchester Drive. Most of the watershed is classified as residential, however almost 20% is commercial and less than 2% is agricultural.

The MO-HUE station is located on Hueneme Drain (a tributary of the J Street Drain at the Pacific Ocean) southeast of Bubbling Springs Park. The land use is predominantly residential, with commercial and vacant land uses accounting for only 3% each.

The MO-SPA station is located on the 11th Street Drain where it enters the Santa Clara River, east of the Santa Paula airport. About half of the watershed is classified as residential, less than 15% as commercial, and schools and transportation account for about 10% each.

The MO-SIM station is located on Bus Canyon Drain (a tributary of the Arroyo Simi) near the intersection of 5th Street and Los Angeles Avenue. Over half (57%) of the watershed is classified as vacant and about one third is residential. All other land uses account for less than 1% of the watershed each.

The MO-THO station is located on the North Fork Arroyo Conejo (a tributary to Conejo Creek) in the Hill Canyon WWTP. The main land uses in the watershed are residential (56%) and vacant land (31%).

Figure 9-1 shows the location of the eleven Major Outfall and three Mass Emission stations.

9.4 METHODS

The NPDES permit requires flow-paced sampling at monitoring stations where technically feasible. The reason for this type of sampling is two-fold. First, by collecting sub-samples (aliquots) based on flow, a more accurate representation of the Event Mean Concentration (EMC) of each constituent in the runoff can be achieved. Second, by multiplying the EMC by the total flow during sample collection, a mass of each constituent discharged during each sampling event can be determined. Ideally, sampling events represent the entire hydrograph, however difficulties inherent in predicting precipitation quantity, intensity, and resulting runoff may result in partial representation of the complete storm event. Therefore, EMC are only representative of the sampling event duration and not the entire storm and mass emission quantities are calculated accordingly. These benefits are discussed further below.

Flow-paced sampling is not technically feasible at three sites, ME-SCR, MO-FIL, and MO-HUE. Since its installation in 2001, the monitoring station at ME-SCR has been monitored on a time-paced basis, as allowed by the RWQCB. This site is located at the UWCD's Freeman Diversion Dam, where irregular operation of the gates associated with the diversion dam makes it impossible to calculate flow. During most of the year, water is sent through a canal in which it is easy to calculate flow. However, during rainfall events and periodically throughout the year, the UWCD will close the gates to the diversion canal, allowing water to go through a high-velocity bypass or spill over the dam itself. Computing flow over the latter is difficult, given the breadth of the dam, which spans the entire river bottom. Computing flow through the bypass is impossible due to the wide ranges in water surface elevation and velocity. The MO-FIL station is located at an outfall into Sespe Creek and is subject to backwater due to plant growth and sediment deposition, which makes accurate flow determination impossible. The MO-HUE station is located in a canal which is drained via pumps that are triggered based on water surface elevation. The pumps are operated intermittently which makes flow-paced sampling inappropriate.

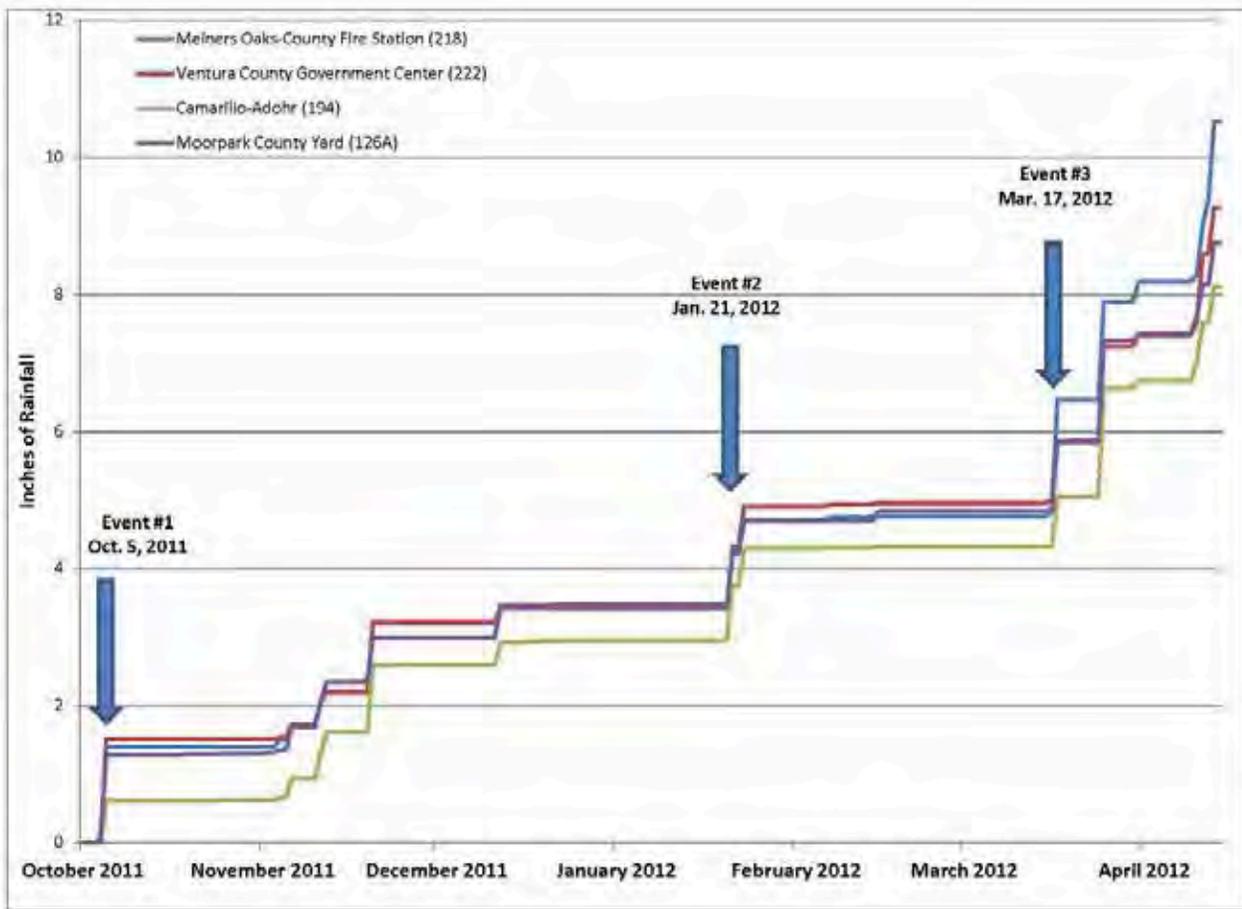
9.4.1 Precipitation

Precipitation amounts, both historical and predicted, are integral to performing flow-weighted sampling. Historical precipitation data is necessary to determine the relationship between rainfall and runoff. In the major watersheds with long-term Mass Emission stations, the rainfall-to-runoff (RTR) ratio is based on over 65 years of data and takes into account antecedent soil moisture conditions. These RTR tables have been used and refined by the Stormwater Monitoring Program for over 10 years.

At the time the Major Outfall stations were installed, the Stormwater Monitoring Program had access to real time precipitation data from the VCWPD's Hydrology section [part of the Automated Local Evaluation in Real Time (ALERT) network]; however it was not in a form that was usable by the Program. Changes to the processing of the ALERT data allowed the Program to capitalize on the already installed and maintained ALERT rainfall gauges. Most of the monitoring stations were able to use data from nearby ALERT gauges. Those monitoring stations that do not have nearby ALERT gauges (ME-SCR, ME-VR2, MO-CAM, MO-MEI, MO-VEN, and MO-HUE) have tipping bucket rainfall gauges (0.01" per tip) installed instead.

While the rainfall gauges purchased and maintained by the Stormwater Monitoring Program are of high quality, the data generated by these gauges are subjected to less stringent quality control measures than the "official" gauges maintained by the Hydrology section. Therefore, the Stormwater Monitoring Program has opted to show cumulative totals from representative ALERT gauges when indicating dates that actual sampling events occurred, as shown in Figure 9-2 Precipitation at Selected Sites. Gauge 218 is located in the Ojai Valley near the MO-MEI station. Gauge 222 is located at the County Government Center near the MO-VEN station. Gauge 194 is located at the base of the Conejo Grade, somewhat equidistant from the ME-CC and MO-CAM stations. Gauge 126A is located at the Moorpark County Yard near the MO-MPK station. Rainfall data gathered at specific monitoring stations can be found in Appendix B in Attachment E.

Figure 9-2 Precipitation at Selected Sites



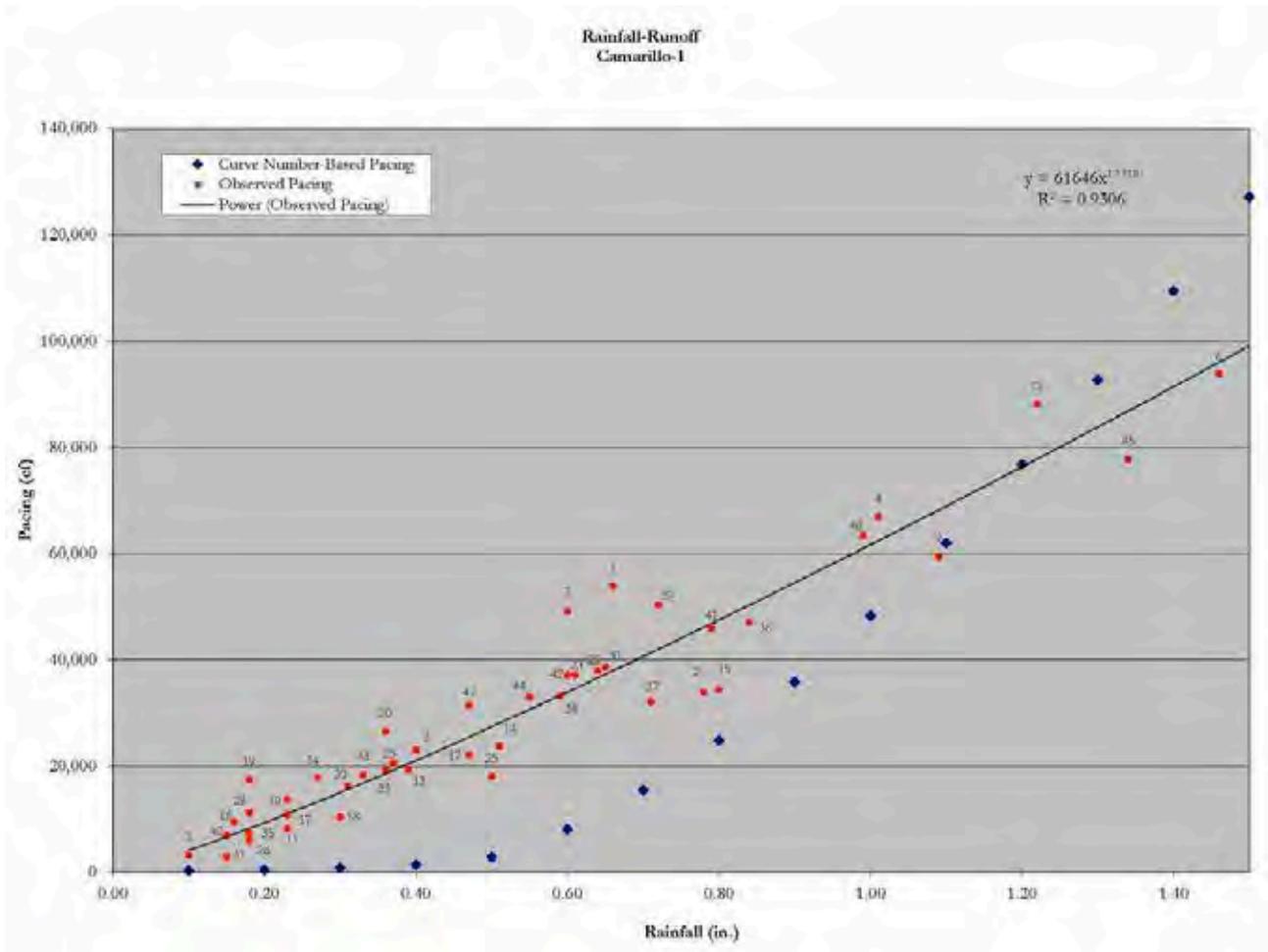
9.4.2 Rainfall-to-Runoff Ratios

Prior to starting monitoring under the new permit (before monitoring season 2009/10), the Stormwater Monitoring Program enlisted the VCWPD's Hydrology section to assist in modeling the expected rainfall-to-runoff (RTR) ratio for each new Major Outfall station. The Hydrology section used the NRCS Curve Number approach that is commonly used in hydrologic modeling. This model takes into account land use and soil types within each watershed, but relies on using a wetter soil moisture condition than actually exists for all but the largest of rainfall events. Despite these known limitations, these RTR ratios represented a good beginning point for flow-weighted sampler pacing. A further description of the methods and limitations of this approach, as described by the Hydrology section, can be found in Appendix C in Attachment E.

Over the course of the 2009/10, 2010/11, and 2011/12 monitoring years, the Stormwater Monitoring Program refined these model results by comparing the runoff generated at each site with the corresponding rainfall, where runoff was sufficient to be detected by the equipment and rainfall was greater than 0.1 inch. Figure 9-3 shows an example of these two pieces of information, as a function of the proper pacing of the automated sampler (see Section 9.4.3 for a further description of sampler pacing).

Figure 9-3 shows all rainfall events together, regardless of antecedent soil moisture conditions. However, as more data becomes available, the RTR ratios will be divided into dry, moderate and wet antecedent soil moisture conditions as has been done for the Mass Emission stations. This will allow the Stormwater Monitoring Program to more accurately pace automated samplers based on the predicted size of each storm.

Figure 9-3. Example of Rainfall-to-Runoff Modeling Versus Actual Rainfall Events



9.4.3 Flow-Paced Sampling

To compute flow, ISCO flow meters were installed at all locations (except at the aforementioned ME-SCR, and at MO-HUE, where the pump station prevents flow from being able to be measured accurately). ISCO 4230 bubblers were installed at all other stations except MO-FIL and MO-SPA, which received ISCO 4250 area-velocity meters instead. By measuring pressure head and relating it to a rating table, ISCO 4230s are capable of calculating instantaneous discharge. Measurement accuracy of the 4230 is not affected by wind, steam, foam, turbulence, suspended solids, or rapidly changing head heights. These types of flow meters are extremely low maintenance and highly reliable and were, therefore, chosen over other contact (ISCO 4250 area-velocity) and non-contact (ISCO 4210 ultrasonic) types of flow measuring devices when possible. ISCO 4250 area-velocity meters use Doppler technology to directly measure average velocity in the flow stream, while the integral pressure

transducer measures liquid depth to determine flow area. The 4250 then calculates flow rate by multiplying the area of the flow stream by its average velocity. The 4250 is best for applications where weirs or flumes are not practical, or where submerged, full pipe, surcharged, and reverse flow conditions may occur, such as at the MO-FIL and MO-SPA monitoring sites.

Flow-paced sampling involves collecting sub-samples (aliquots) on a volumetric flow interval basis, with a set aliquot volume collected at passage of each equal, pre-set flow volume, and then compositing these aliquots into one sample for analysis. In its simplest terms, flow-paced sampling can be achieved by estimating the total flow that will pass a sampling location (which, itself, is dependent on predicted rainfall amounts and intensities) and dividing that by the number of aliquots to be taken. Using Figure 9-3 above as an example, an approximate 1.0” rainfall event would generate about 2.3 million cubic feet of runoff, which when divided by 35 (the number of aliquots the Stormwater Monitoring Program attempts to take per event at each site) provides the proper pacing of around 67,000 cubic feet per aliquot (see data point #4). As mentioned above, this pacing volume is highly dependent on other variables such as intensity and antecedent soil moisture conditions.

Although composite samplers are automated, Stormwater Monitoring Program staff actively monitored storm and flow conditions during each event in order to adaptively adjust the sampler to capture the best representation of storm flow. This was made possible by the new telemetry capabilities of the Stormwater Monitoring Program. Previously, Stormwater Monitoring Program staff members were required to visit each site as the timing and amounts of predicted rainfall changed. Each site is now equipped with a cellular modem that makes communication and changes to sampler pacing and timing possible. Furthermore, the data from each of these sites is pushed via a static IP address to a centrally located SQL server and is accessible in near real-time format. Due to this set-up, site visits were only necessary to set up the site initially, take grab samples, collect composite sample bottles, and correct physical problems with the site. A schematic of this set-up is shown in Figure 9-4. An example of the data available to Stormwater Monitoring Program staff in the Storm Control Center is shown in Figure 9-5.

Figure 9-4. Schematic of Remote Data Delivery and Access

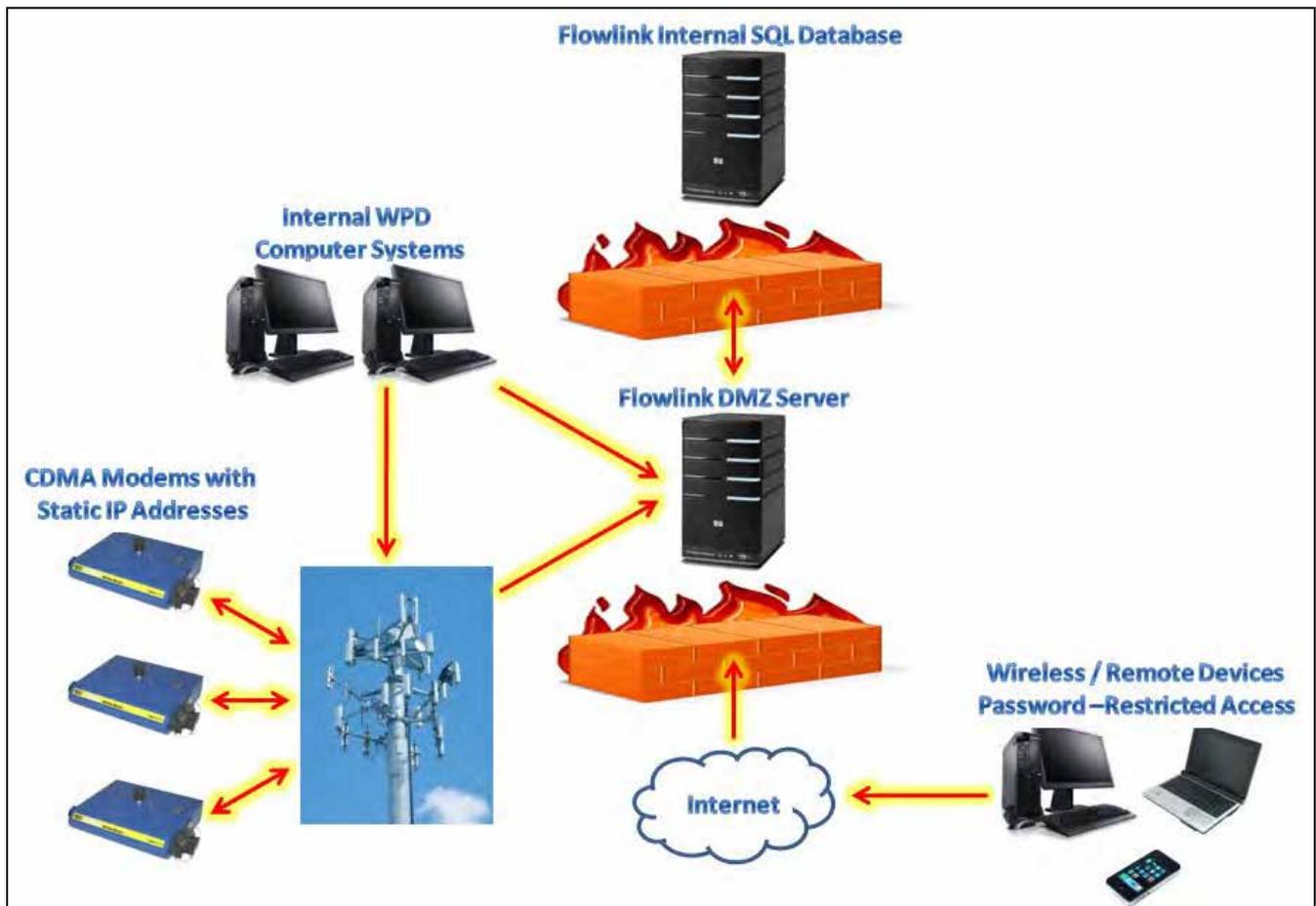
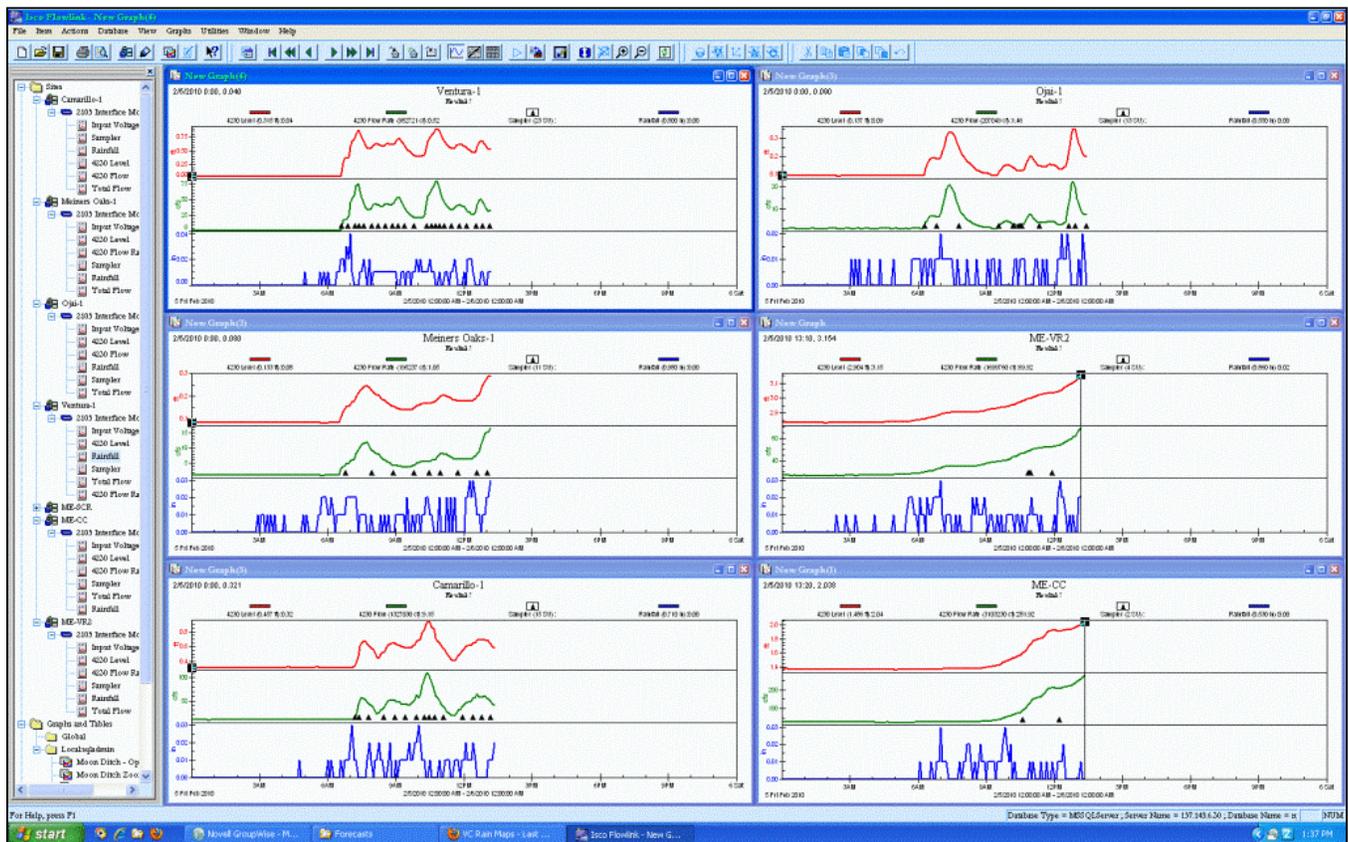


Figure 9-5. Real-Time Data Available in Storm Control Center



9.4.4 Sample Collection

As detailed in the NPDES permit, the Stormwater Monitoring Program was to sample three wet-weather events, described as a greater than 20% increase in base flow preceded by at least 7 days of dry weather (<0.10” each day), and one dry-weather event during each Permit year. Emphasis was placed on capturing the first event of the year, as well as the first part of each storm, both of which can be described as the first flush. The Stormwater Monitoring Program was able to successfully sample the necessary quantity and type of events as dictated by the NPDES permit, with the exception of ME-SCR in Event 1 (reduced sample volume due to UWCD turnout) and MO-SPA and MO-MPK in Event 4 (which had insufficient flow for sample collection). See Table 9-1 for site flow and event durations.

In Table 9-1, Start Date/Time and End Date/Time describe the length of time the automated sampler was actually taking samples. The true time of the rainfall and related runoff event was always longer; since the samplers were programmed to begin taking samples after flow had risen to greater than 20% of base flow, which took 0.10” to 0.25” of rainfall, depending on the antecedent conditions and sampling location.⁷ Furthermore, flow often

⁷ This range represents the amount of rainfall needed to generate measurable flow at the monitoring station. Smaller amounts of rainfall generated positive flow in watersheds with proportionally more impervious area. All automated sampling programs were designed to begin

continued after the automated sampler had completed its sampling program, because of the Stormwater Monitoring Program’s goal to ensure that enough aliquots were taken to perform the required analyses. Because of this goal, the Stormwater Monitoring Program erred on the conservative side, pacing the samplers a bit quicker than the RTR tables dictated. As the RTR tables are refined, this error will become smaller, but will never completely disappear due to the inherent error in rainfall predictive abilities by both commercial and public weather forecasters. The relative timing of the onset of rainfall, commencement of the sampling program and duration of the flow for each site can be found in the event hydrographs located in Appendix B in Attachment E and is described further in the event descriptions, below.

The sampling methods and sample handling procedures used during the 2011/12 monitoring year are described in *Ventura Countywide Stormwater Monitoring Program: Water Quality Monitoring Standard Operating Procedures, 2009-2014*.

Table 9-1: Site Flow Data and Event Durations

Site ID	Event No.	Event Date ^a	Average Flow (CFS)	Start Date, Time ^b	End Date, Time ^b	Event Duration
ME-CC	1	10/5/2011	216.03	10/5/2011 8:55	10/5/2011 21:41	12:46
	2	1/21/2012	176.95	1/20/2012 23:11	1/21/2012 11:58	12:47
	3	3/17/2012	389.35	3/17/2012 7:59	3/18/2012 5:14	21:15
	4	5/23/2012	10.69	5/23/2012 10:31	5/24/2012 9:44	23:13
ME-VR2	1	10/5/2011	16.42	10/5/2011 7:31	10/6/2011 8:41	25:10
	2	1/21/2012	9.52	1/21/2012 4:57	1/21/2012 13:11	8:14
	3	3/17/2012	22.72	3/17/2012 6:08	3/18/2012 6:34	24:26
	4	4/23/2012	9.03	4/23/2012 9:34	4/24/2012 9:02	23:28
ME-SCR	1	10/5/2011	c	10/5/2011 4:16	10/6/2011 3:30	23:14
	2	1/21/2012	c	1/21/2012 1:46	1/21/2012 13:06	11:20
	3	3/17/2012	c	3/17/2012 5:46	3/18/2012 5:34	23:48
	4	5/21/2012	c	5/21/2012 8:34	5/22/2012 8:04	23:30
MO-CAM	1	10/5/2011	59.01	10/5/2011 4:32	10/5/2011 9:57	5:25
	2	1/21/2012	57.16	1/21/2012 2:01	1/21/2012 4:27	2:26
	3	3/17/2012	26.10	3/17/2012 5:48	3/17/2012 22:32	16:44
	4	5/23/2012	0.10 ^d	5/23/2012 9:59	5/24/2012 9:13	23:14
MO-MEI	1	10/5/2011	6.90	10/5/2011 6:02	10/5/2011 11:17	5:15
	2	1/21/2012	7.08	1/21/2012 3:32	1/21/2012 4:07	0:35
	3	3/17/2012	14.76	3/17/2012 3:40	3/17/2012 8:40	5:00
	4	4/23/2012	0.05 ^d	4/23/2012 9:07	4/24/2012 8:26	23:19
MO-OJA	1	10/5/2011	10.86	10/5/2011 6:51	10/5/2011 8:52	2:01

when the water in the creek or channel exceeded the elevation of the intake strainer by more than a couple hundredths of a foot, effectively capturing the “first flush.”

	2	1/21/2012	12.21	1/21/2012 3:19	1/21/2012 3:41	0:22
	3	3/17/2012	24.07	3/17/2012 3:23	3/17/2012 7:20	3:57
	4	4/23/2012	0.50 ^d	4/23/2012 8:04	4/24/2012 7:28	23:24
MO-VEN	1	10/5/2011	44.80	10/5/2011 4:22	10/5/2011 8:32	4:10
	2	1/21/2012	25.29	1/21/2012 1:31	1/21/2012 5:12	3:41
	3	3/17/2012	9.67	3/17/2012 3:52	3/17/2012 21:37	17:45
	4	5/21/2012	2.34	5/21/2012 9:47	5/22/2012 9:04	23:17
MO-OXN	1	10/5/2011	31.49	10/5/2011 4:06	10/5/2011 8:30	4:24
	2	1/21/2012	17.31	1/20/2012 0:07	1/21/2012 4:21	28:14
	3	3/17/2012	11.38	3/17/2012 4:05	3/17/2012 23:46	19:41
	4	5/21/2012	0.10 ^d	5/21/2012 10:27	5/22/2012 9:46	23:19
MO-HUE	1	10/5/2011	c	10/5/2011 3:46	10/5/2011 16:04	12:18
	2	1/21/2012	c	1/20/2012 23:53	1/21/2012 8:23	8:30
	3	3/17/2012	c	3/17/2012 2:00	3/18/2012 1:47	23:47
	4	5/23/2012	c	5/23/2012 11:00	5/24/2012 10:47	23:47
MO-SPA	1	10/5/2011	7.27	10/5/2011 3:37	10/5/2011 8:57	5:20
	2	1/21/2012	4.04	1/21/2012 1:36	1/21/2012 4:03	2:27
	3	3/17/2012	4.34	3/17/2012 4:30	3/17/2012 22:09	17:39
	4	5/21/2012	DRY ^e	DRY ^e	DRY ^e	DRY ^e
MO-FIL	1	10/5/2011	c	10/5/2011 5:44	10/6/2011 4:58	23:14
	2	1/21/2012	c	1/21/2012 1:55	1/21/2012 9:39	7:44
	3	3/17/2012	c	3/17/2012 4:55	3/17/2012 16:49	11:54
	4	5/21/2012	c	5/21/2012 7:28	5/22/2012 6:42	23:14
MO-SIM	1	10/5/2011	18.80	10/5/2011 6:59	10/5/2011 14:03	7:04
	2	1/21/2012	30.89	1/21/2012 3:38	1/21/2012 6:47	3:09
	3	3/17/2012	14.73	3/17/2012 6:11	3/17/2012 23:52	17:41
	4	5/23/2012	2.00 ^d	5/23/2012 8:30	5/24/2012 7:44	23:14
MO-MPK	1	10/5/2011	8.21	10/5/2011 6:12	10/5/2011 12:50	6:38
	2	1/21/2012	4.85	1/21/2012 2:54	1/21/2012 4:21	1:27
	3	3/17/2012	14.32	3/17/2012 7:11	3/17/2012 12:21	5:10
	4	5/23/2012	DRY ^e	DRY ^e	DRY ^e	DRY ^e
MO-THO	1	10/5/2011	44.98	10/5/2011 9:29	10/5/2011 12:33	3:04
	2	1/21/2012	64.20	1/21/2012 4:37	1/21/2012 7:34	2:57
	3	3/17/2012	46.00	3/17/2012 7:29	3/17/2012 18:51	11:22
	4	5/23/2012	0.92	5/23/2012 9:06	5/24/2012 8:20	23:14

* All times PST

^a Event Date describes the date on which composite sampling began for a particular monitoring event.

^b Start Date/Time and End Date/Time describe the duration samples were actually taken.

^c Time-paced as flows cannot be accurately measured at these sites. ME-SCR: During wet weather the Santa Clara River flows through the river diversion gate and over the diversion dam. Currently, there is no flow meter installed at the river diversion gate where a majority of the wet weather flow passes. MO-FIL: Site experiences ponding and backwater effects due to natural bottom channel. MO-HUE: Flow is dependent on the release of water at the Hueneme pump station.

^d Flow is estimated as dry weather flows are below the threshold levels for measurement.

^e Insufficient flow over 24 hours available for sample collection.

At all monitoring stations, both composite and grab samples were collected. Composite samples were collected in glass containers and then delivered to the lab, where they were split by agitating the bottle, pouring off the necessary volume into a sample bottle, and repeating as necessary. When the splitting of a composite sample was performed, the composite sample was continually agitated to provide as much "non-invasive" mixing as possible. Sample splitting allowed homogeneous aliquots of a single, large water sample to be divided into several smaller sub-samples for different analyses. The volume of sample collected depended upon the volume required by the lab to perform requested water quality and QA/QC analyses.

Grab samples were taken as close to mid-stream, mid-depth as possible by immersing the sample bottle directly in the water (see Figure 9-6). In some situations, site conditions precluded such sampling and alternative sampling techniques were used. At the larger, deeper Mass Emission stations, grab samples were often gathered near the bank, but still in positive flow, often with the help of a long, extended swing sampler (see Figure 9-7). This technique was also employed at some of the Major Outfall stations where getting into the channel would have compromised personnel safety.

Figure 9-6. Grab Sampling at Mid-Stream, Mid-Depth



For constituents analyzed from samples required to be collected as “grabs,” samples were ideally taken at the peak runoff flow to provide the best estimate for an event mean concentration (EMC). In practice, it was difficult to both predict the peak flow for each site and to allocate manpower such that all sites were grab-sampled at the storm event peak flow. It should be noted that peak flow times varied for each monitoring station due to the size and inherent characteristics of the watershed in which the site was located, as well as varying durations and intensities of rainfall. All grab and composite wet weather samples collected during the 2011/12 monitoring season are considered best available estimates of storm EMCs.

The chemical analysis of some constituents is not possible in a laboratory setting and must be performed in the field. These constituents were analyzed using pre-calibrated field meters at the time when grab samples were collected. All field meters were calibrated according to manufacturers’ directions, using vendor-supplied calibration solutions where applicable

In an effort to maintain quality control for the sampling program, the sampling crew, in cooperation with the analytical laboratories, has minimized the number of laboratories and sample bottles used for analysis. This has minimized bottle breakage, increased efficiency, and reduced the chances for contamination of the samples. Also, a dedicated monitoring team was used to provide consistent sample collection and handling.

As a means of documenting all preparatory, operational, observational, and concluding activities of a monitoring event, the Stormwater Monitoring Program produced an event summary for each monitoring event. These event summaries include, but are not limited to, information related to event duration, predicted and actual precipitation, weather conditions, the programming of sampling equipment, equipment malfunctions, sample collection and handling, and sample tracking with respect to delivery to analytical laboratories. All event summaries associated with the 2011/12 monitoring season are presented in Appendix D in Attachment E.

Figure 9-7. Grab Sampling Using Extended-Reach Swing Sampler



The Stormwater Monitoring Program also documented the actual samples it collected at each monitoring site – and the date and time of collection – during the course of an event by completing a chain of custody (COC) form for each sampling event. The COC form not only documented sample collection, but also notified an analytical laboratory that a particular sample should be analyzed for a certain constituent or group of constituents, oftentimes specifying the analytical method to be employed. Finally, the COC form acted as an evidentiary document noting how many samples were relinquished – and at what date and time – to a particular laboratory by the Stormwater Monitoring Program. All chain of custody forms associated with

the 2011/12 monitoring season are presented in Appendix E in Attachment E.

The QA/QC sampling schedule was designed to be flexible in response to changing conditions, with the analytical chemistry laboratory being instructed to utilize VCWPD samples for MS/MSD and laboratory duplicate analyses when sample volume was sufficient, rather than for specific sites for each event. This flexibility is of benefit for several reasons. First, as is often the case, rainfall duration and intensity were difficult to predict, especially in the early part of the season. Second, extremely dry antecedent conditions made forecasting flow conditions at the various monitoring locations complicated. Finally, site-specific complications can affect sample volume. An example of this is the operation of the diversion canal at ME-SCR by UWCD, which can leave the primary intake line of the sampler out of the water, thereby causing insufficient sample volume as the sampler pulls air instead of river water. While the Stormwater Monitoring Program has installed multiple intake lines to deal with this situation, the time at which UWCD opens the gates to the diversion structure must be known and since UWCD's operation of this structure depends on turbidity in the river, it is extremely difficult to predict when the primary intake line ceases to become useful and the sampler needs to be switched over to the secondary intake line. The flexibility in QA/QC sampling station selection allows the laboratory more options for using VCWPD samples for QA/QC tests than would otherwise be possible, due to the ability to select sites with surplus volume.

Event 1 (Wet)

The first rainfall event of the year began early in the morning on October 5, 2011, with the bulk of the rain falling before noon on the same day. Rainfall was estimated at 0.50" to 1.0" at the monitoring sites. The rainfall lasted approximately 10 hours and by the time the storm had moved through the area, approximately 0.6" of rain had fallen at the coast and up to 1.7" had fallen inland. Most sites received more than an inch of rain.

UWCD temporarily stopped diverting the water on 10/5/2011 due to high turbidity. This resulted in a reduced sample volume of 5 liters to be collected at ME-SCR. The laboratory initiated the priority list for analyses.

Event 2 (Wet)

The second monitoring event of the season began around midnight on the morning of January 21, 2012. Rainfall estimates of 0.25" to 0.50" were forecast for Ventura County which was less than the observed amounts which were closer to 0.5" to 1.0". The storm lasted approximately eight hours.

Event 3 (Wet)

Rain for Event 3 began early in the morning on March 17, 2012. The remote programming capabilities were not operational for Event 3 due to issues with Verizon's Circuit Switched Data program. Pacing changes could not be made remotely and had to be made manually via the 6712 sampler pulse counts. Forecasts were between 0.75" and 1.5" with potential for up to 3" in the mountains. Rain amounts were relatively accurate, with 0.5" to 1.5" seen at most sites across the county over about 7 hours. Rain amounts and durations were a little higher in the Ojai Valley.

Event 4 (Dry)

The dry-weather sampling events took place over three days, on April 23, May 21, and May 23, 2012. Sampling was organized and conducted by major watershed. The Ventura River Watershed sites (ME-VR2, MO-OJA, and MO-MEI) were sampled on April 23, approximately 10 days after the last rainfall. Since MO-MEI is known to go dry relatively quickly after the end of the rain season, this watershed was sampled soon (but greater than seven days) after the last rain in order to be able to collect sample at this site. The Santa Clara River Watershed sites (ME-SCR, MO-FIL, MO-SPA, MO-OXN, and MO-VEN) were sampled on May 21, 2012, approximately one month after the last rainfall. MO-SPA had been dry for most of the month prior to the sampling event, including the preceding four days and stayed dry during the sampling event so samples could not be collected. The Calleguas Creek Watershed (ME-CC, MO-CAM, MO-SIM, MO-MPK, MO-THO) and Coastal Watershed (MO-HUE) were sampled two days later, on May 23, 2012. There was no flow at MO-MPK so samples could not be taken. Sampling duration at all sites was about 23 hours.

2012-DRY

The dry-season, dry-weather grab samples were collected from representative MS4 outfalls on two days, August 15 and 16, 2012. Fillmore-1 (MO-FIL), Ojai-1 (MO-OJA), Oxnard-1 (MO-OXN), Santa Paula-2 (Fagan Canyon), and Ventura-1 (MO-VEN) were sampled on August 15, 2012. Camarillo-1 (MO-CAM), Moorpark-1 (MO-MPK), Port Hueneme-3 (Bubbling Springs Park), Simi Valley-1 (MO-SIM), and Thousand Oaks-1 (MO-THO), and Unincorporated-2 (Medea Creek in Oak Park) were sampled on August 16, 2012. There was at least 72 hours of dry weather preceding each sampling event.

During the dry sampling events, Stormwater Monitoring Program staff deployed sand-weighted silicone dams where necessary to allow very low flows to pool up to sampleable depths. This provided the depth needed to submerge the grab bottles and/or automated sampler intake line to facilitate successful sample collection (see Figure 9-8). This innovative technique is further discussed in *Ventura Countywide Stormwater Monitoring Program: Water Quality Monitoring Standard Operating Procedures, 2009-2014*.

Figure 9-8. Typical Wet-Season, Dry-Weather Sampling Configuration



9.4.5 Analyses Performed

Attachment G of the Permit lists the constituents to be analyzed for each event⁸. In addition to this broad suite of analytes, Attachment B specifies other site-specific analytes that have been identified as problematic pollutants in

⁸ For Permit sections A. Mass Emission and B. Major Outfalls only. The constituents for Section C. Dry Weather Analytical Monitoring are listed separately in that section and are detailed in Section 9.7 of this report.

previous years of water quality sampling. These, and any unrequested analytes for which results are obtained during method analysis, were incorporated into the sampling program and appear in the tables below. Table 9-2 shows those analytes that were gathered as discrete samples.

Table 9-3 shows those analytes that were gathered as composite samples. All laboratory chemical analyses of environmental samples and pre-season equipment blank samples were performed by Weck Laboratories, with the exception of analyses for indicator bacteria, which were performed by the Ventura County Public Health Lab.

Table 9-2. Analytes Derived from Discrete Samples

Grab Samples (Classification)	Field Meter Analytes (Classification)
Oil and grease (hydrocarbon)	pH (conventional)
Total Petroleum Hydrocarbons (hydrocarbon)	Temperature (conventional)
2-Chloroethyl vinyl ether (organic)	Dissolved oxygen (conventional)
Methyl tertiary butyl ether (MTBE) (organic)	Conductivity (conventional)
Cyanide (conventional)	Specific conductance (conventional)
<i>E. coli</i> (bacteriological)	Salinity (conventional)
Enterococcus (bacteriological)	
Fecal Coliform (bacteriological)	
Total Coliform (bacteriological)	

Table 9-3. Analytes Derived from Composite Samples

Classification	Constituent	Method
Anion	Chloride	EPA 300.0
	Fluoride	EPA 300.0
	Perchlorate	EPA 314.0
Cation	Calcium (Total)	EPA 200.7
	Magnesium (Total)	EPA 200.7
Conventional	Alkalinity as CaCO ₃	SM 2320 B
	BOD	SM 5210 B
	COD	EPA 410.4
	Hardness as CaCO ₃ (Total)	EPA 200.7
	MBAS	SM 5540 C
	Phenolics	EPA 420.4
	Specific Conductance	SM 2510 B
	Total Chlorine Residual	SM 4500-Cl G
	Total Dissolved Solids	SM 2540 C
	Total Organic Carbon	SM 5310 C
	Total Suspended Solids	SM 2540 D
	Turbidity	EPA 180.1
	Volatile Suspended Solids	EPA 160.4
Metal	Aluminum (Dissolved)	EPA 200.8
	Aluminum (Total)	EPA 200.8
	Antimony (Dissolved)	EPA 200.8
	Antimony (Total)	EPA 200.8
	Arsenic (Dissolved)	EPA 200.8
	Arsenic (Total)	EPA 200.8

Classification	Constituent	Method
	Barium (Dissolved)	EPA 200.8
	Barium (Total)	EPA 200.8
	Beryllium (Dissolved)	EPA 200.8
	Beryllium (Total)	EPA 200.8
	Cadmium (Dissolved)	EPA 200.8
	Cadmium (Total)	EPA 200.8
	Chromium (Dissolved)	EPA 200.8
	Chromium (Total)	EPA 200.8
	Chromium VI (n/a)	EPA 218.6
	Copper (Dissolved)	EPA 200.8
	Copper (Total)	EPA 200.8
	Iron (Dissolved)	EPA 200.8
	Iron (Total)	EPA 200.8
	Lead (Dissolved)	EPA 200.8
	Lead (Total)	EPA 200.8
	Mercury (Dissolved)	EPA 245.1
	Mercury (Total)	EPA 245.1
	Nickel (Dissolved)	EPA 200.8
	Nickel (Total)	EPA 200.8
	Selenium (Dissolved)	EPA 200.8
	Selenium (Total)	EPA 200.8
	Silver (Dissolved)	EPA 200.8
	Silver (Total)	EPA 200.8
	Thallium (Dissolved)	EPA 200.8
	Thallium (Total)	EPA 200.8
	Zinc (Dissolved)	EPA 200.8
	Zinc (Total)	EPA 200.8
Nutrient	Ammonia as N	EPA 350.1
	Nitrate + Nitrite as N	EPA 353.2
	Nitrate as N	EPA 353.2
	Phosphorus as P (Dissolved)	EPA 365.1
	TKN	EPA 351.2
Organic	1,2,4-Trichlorobenzene	EPA 625
	1,2-Dichlorobenzene	EPA 625
	1,2-Diphenylhydrazine	EPA 625
	1,3-Dichlorobenzene	EPA 625
	1,4-Dichlorobenzene	EPA 625
	2,4,5-Trichlorophenol	EPA 8270Cm ⁹
	2,4,6-Trichlorophenol	EPA 8270Cm ⁵
	2,4-Dichlorophenol	EPA 8270Cm ⁵
	2,4-Dimethylphenol	EPA 8270Cm ⁵
	2,4-Dinitrophenol	EPA 8270Cm ⁵
	2,4-Dinitrotoluene	EPA 625

⁹ In cases of limited sample, other methods may be used.

Classification	Constituent	Method
	2,6-Dinitrotoluene	EPA 625
	2-Chloronaphthalene	EPA 625
	2-Chlorophenol	EPA 8270Cm ⁵
	2-Methylphenol	EPA 8270Cm ⁵
	2-Nitrophenol	EPA 8270Cm ⁵
	3,3'-Dichlorobenzidine	EPA 625
	3-/4-Methylphenol	EPA 8270Cm ⁵
	4,6-Dinitro-2-methylphenol	EPA 8270Cm ⁵
	4-Bromophenyl phenyl ether	EPA 625
	4-Chloro-3-methylphenol	EPA 8270Cm ⁵
	4-Chlorophenyl phenyl ether	EPA 625
	4-Nitrophenol	EPA 8270Cm ⁵
	Acenaphthene	EPA 8270Cm ⁵
	Acenaphthylene	EPA 8270Cm ⁵
	Anthracene	EPA 8270Cm ⁵
	Benz(a)anthracene	EPA 8270Cm ⁵
	Benzidine	EPA 625
	Benzo(a)pyrene	EPA 525.2
	Benzo(b)fluoranthene	EPA 8270Cm ⁵
	Benzo(g,h,i)perylene	EPA 8270Cm ⁵
	Benzo(k)fluoranthene	EPA 8270Cm ⁵
	Bis(2-chloroethoxy)methane	EPA 625
	Bis(2-chloroethyl)ether	EPA 625
	Bis(2-chloroisopropyl)ether	EPA 625
	Bis(2-ethylhexyl)adipate	EPA 525.2
	Bis(2-ethylhexyl)phthalate	EPA 525.2
	Butyl benzyl phthalate	EPA 625
	Chrysene	EPA 8270Cm ⁵
	Dibenz(a,h)anthracene	EPA 8270Cm ⁵
	Diethyl phthalate	EPA 625
	Dimethyl phthalate	EPA 625
	Di-n-butylphthalate	EPA 625
	Di-n-octylphthalate	EPA 625
	Fluoranthene	EPA 8270Cm ⁵
	Fluorene	EPA 8270Cm ⁵
	Hexachlorobenzene	EPA 625
	Hexachlorobutadiene	EPA 625
	Hexachlorocyclopentadiene	EPA 625
	Hexachloroethane	EPA 625
	Indeno(1,2,3-cd)pyrene	EPA 8270Cm ⁵
	Isophorone	EPA 625
	Naphthalene	EPA 8270Cm ⁵
	Nitrobenzene	EPA 625
	N-Nitrosodimethylamine	EPA 625
	N-Nitrosodi-N-propylamine	EPA 625
	N-Nitrosodiphenylamine	EPA 625
	Phenanthrene	EPA 8270Cm ⁵
	Phenol	EPA 8270Cm ⁵
	Pyrene	EPA 8270Cm ⁵

Classification	Constituent	Method
PCB	PCB Aroclor 1016	EPA 608
	PCB Aroclor 1221	EPA 608
	PCB Aroclor 1232	EPA 608
	PCB Aroclor 1242	EPA 608
	PCB Aroclor 1248	EPA 608
	PCB Aroclor 1254	EPA 608
	PCB Aroclor 1260	EPA 608
Pesticide	2,4,5-T	EPA 515.3
	2,4,5-TP	EPA 515.3
	2,4-D	EPA 515.3
	2,4-DB	EPA 515.3
	2,4'-DDD	EPA 608
	2,4'-DDE	EPA 608
	2,4'-DDT	EPA 608
	3,5-Dichlorobenzoic acid	EPA 515.3
	4,4'-DDD	EPA 608
	4,4'-DDE	EPA 608
	4,4'-DDT	EPA 608
	Acifluorfen	EPA 515.3
	Alachlor	EPA 525.2
	Aldrin	EPA 608
	alpha-BHC	EPA 608
	alpha-Chlordane	EPA 608
	Atrazine	EPA 525.2
	Azinphos methyl	EPA 525.2
	Bentazon	EPA 515.3
	beta-BHC	EPA 608
	Bolstar	EPA 525.2
	Bromacil	EPA 525.2
	Butachlor	EPA 525.2
	Captan	EPA 525.2
	Chloramben	EPA 515.3
	Chlordane (technical)	EPA 608
	Chloroprotham	EPA 525.2
	Chlorpyrifos	EPA 525.2
	Coumaphos	EPA 525.2
	Cyanazine	EPA 525.2
	Dalapon	EPA 515.3
	D CPA (Dacthal)	EPA 515.3
	delta-BHC	EPA 608
	Demeton-O	EPA 525.2
Demeton-S	EPA 525.2	
Diazinon	EPA 525.2	
Dicamba	EPA 515.3	
Dichlorprop	EPA 515.3	
Dichlorvos	EPA 525.2	
Dieldrin	EPA 608	
Dimethoate	EPA 525.2	
Dinoseb	EPA 515.3	

Classification	Constituent	Method
	Diphenamid	EPA 525.2
	Disulfoton	EPA 525.2
	Endosulfan I	EPA 608
	Endosulfan II	EPA 608
	Endosulfan sulfate	EPA 608
	Endrin	EPA 608
	Endrin aldehyde	EPA 608
	EPTC	EPA 525.2
	Ethoprop	EPA 525.2
	Ethyl parathion	EPA 525.2
	Fensulfothion	EPA 525.2
	Fenthion	EPA 525.2
	gamma-BHC (Lindane)	EPA 608
	gamma-Chlordane	EPA 608
	Glyphosate	EPA 547
	Heptachlor	EPA 608
	Heptachlor epoxide	EPA 608
	Malathion	EPA 525.2
	Merphos	EPA 525.2
	Methoxychlor	EPA 608
	Methyl parathion	EPA 525.2
	Metolachlor	EPA 525.2
	Metribuzin	EPA 525.2
	Mevinphos	EPA 525.2
	Mirex	EPA 608
	Molinate	EPA 525.2
	Naled	EPA 525.2
	Pentachlorophenol	EPA 515.3
	Phorate	EPA 525.2
	Picloram	EPA 515.3
	Prometon	EPA 525.2
	Prometryn	EPA 525.2
	Ronnel (Fenchlorphos)	EPA 525.2
	Simazine	EPA 525.2
	Stirophos (Tetrachlorvinphos)	EPA 525.2
	Terbacil	EPA 525.2
	Thiobencarb	EPA 525.2
	Tokuthion	EPA 525.2
	Toxaphene	EPA 608
	Trichloronate	EPA 525.2
	Trithion	EPA 525.2

9.4.6 Quality Assurance / Quality Control

The following is a discussion of the results of the quality assurance and quality control (QA/QC) analysis performed on the 2011/12 stormwater quality monitoring data. The data were evaluated for overall sample integrity, holding time exceedances, contamination, accuracy, and precision using field- and lab-initiated QA/QC sample results according to the Stormwater Monitoring Program's *Data Quality Evaluation Plan* and *Data*

Quality Evaluation Standard Operating Procedures. The *Data Quality Evaluation Plan* (DQEP) describes the process by which water chemistry data produced by the Stormwater Monitoring Program are evaluated. Data quality evaluation is a multiple step process used to identify errors, inconsistencies, or other problems potentially associated with Stormwater Monitoring Program data. The DQEP contains a detailed discussion of the technical review process, based on U.S. Environmental Protection Agency (EPA) guidance and requirements set forth by the Stormwater Monitoring Program used to evaluate water quality monitoring data. The DQEP provides a reference point from which a program-consistent quality assurance/quality control (QA/QC) evaluation can be performed by the Stormwater Monitoring Program. The *Data Quality Evaluation Standard Operating Procedures* (SOPs) document provides a set of written instructions that documents the process used by the Stormwater Monitoring Program to evaluate water quality data. The SOPs describe both technical and administrative operational elements undertaken by the Stormwater Monitoring Program in carrying out its DQEP. The SOPs act as a set of prescriptive instructions detailing in a step-by-step manner how District staff carry out the data evaluation and data quality objectives set forth in the DQEP. QA/QC sample results from the 2011/12 monitoring season are presented in Appendix F in Attachment E.

QA/QC sample collection and analysis relies upon QA/QC samples collected in the field (such as equipment blank, field duplicate, and matrix spike samples), as well as QA/QC samples prepared and analyzed by the analytical laboratory (i.e., lab-initiated samples, such as method blanks, filter blanks, and laboratory control spikes) performing the analysis. The actual chemical analysis of field-initiated and lab-initiated QA/QC samples is conducted in an identical manner as the analysis of field-collected environmental samples. After all analyses are complete, the results of the field-initiated and lab-initiated QA/QC sample results are compared to particular data quality objectives (DQOs), also commonly referred to as “QA/QC limits.” These limits are typically established by the analytical laboratory based on EPA protocols and guidance. However, in some cases, the Stormwater Monitoring Program will set a particular DQO, such as the QA/QC limit for field duplicate results.

QA/QC sample results are evaluated in order to compare them to their appropriate QA/QC limits and identify those results that fall outside of these limits. The QA/QC evaluation occurs in two separate steps as the laboratory will review those results that fall outside of its QA/QC limits and typically label these results with some type of qualification or note. If a QA/QC sample result falls grossly outside of its associated QA/QC limit, and thus indicates that there is a major problem with the lab’s instrumentation and/or analytical process, then the laboratory should re-run both the affected QA/QC and environmental samples as necessary. The second step in the QA/QC evaluation process occurs when the Stormwater Monitoring Program performs an overall sample integrity evaluation, as well as specific holding time, contamination, accuracy, and precision checks. This second evaluation step provides an opportunity to thoroughly review the Stormwater Monitoring Program’s data to identify potential errors in a laboratory’s reporting of analytical data and/or recognize any significant data quality issues that may need to be addressed. After this evaluation the Stormwater Monitoring Program is ready to qualify their environmental data as necessary based on the findings of the QA/QC assessment.

Data qualification occurs when the Stormwater Monitoring Program assigns a particular program qualification to an analytical result as a means to notify data users that the result was produced while one or more DQOs or QA/QC limitations were exceeded. Environmental sample results are qualified in order to provide the user of these data with information regarding the quality of the data. Depending on the planned use of the data, qualifications may help to determine whether or not the data are appropriate for a given analysis. In general, data that are qualified with anything other than an “R” (used to signify a rejected data point) are suitable for most analyses. However, the qualifications assigned to the data allow the user to assess the appropriateness of the data for a given use. The Stormwater Monitoring Program used its NDPES Stormwater Quality Database to conduct a semi-automated QA/QC evaluation of the current season’s data contained in the database. The use of the database allows the Stormwater Monitoring Program to expedite and standardize the QA/QC evaluation of its monitoring data in conjunction with the use of the DQEP and SOPs. After reviewing the qualifications assigned to each qualified data point in the 2011/12 monitoring year data set, the environmental data are considered to be of high

quality and sufficient for all future general uses. However, all data qualifiers should be reviewed and considered prior to the use of the data in a specific analysis or application. Environmental data from the 2011/12 monitoring season are presented in Appendix G.

Both environmental and field-initiated QA/QC samples were collected in the field using clean sampling techniques. To minimize the potential for contamination, Weck Laboratories cleaned all bottles used for composite samples. Only new containers were used for grab sample collection, with the appropriate preservative added to grab bottles by Weck. Intake lines for the automated samplers were flushed using distilled water. Designated sampling crew leaders were used to ensure that consistent sample collection and handling techniques were followed during every monitoring event.

Field-initiated QA/QC samples performed by the Stormwater Monitoring Program during the 2011/12 monitoring season included field blanks, field duplicates, and equipment blanks. Equipment blanks are typically prepared prior to the start of the monitoring season to check that tubing, strainers, and sample containers aren't sources of contamination for the Stormwater Monitoring Program's environmental samples. Tubing equipment blanks were collected from the sampling equipment by passing blank water through cleaned tubing and into brand new sample bottles. Composite bottle equipment blanks were collected by adding blank water to a composite bottle and allowing it to sit at 4°C for 24 hours before being split into brand new sample bottles for analysis. After collection, equipment blanks were submitted to the analytical laboratory and analyzed using the same methods as those employed for routine environmental sample analysis.

9.4.7 Equipment Blanks

Equipment blanks, often referred to as pre-season blanks, were collected prior to the monitoring season to test for contamination in sample containers (e.g., composite bottles) and sample equipment (e.g., intake lines, tubing, and strainers). This process consists of running laboratory-prepared blank water through sampler tubing to identify potential contamination of field-collected samples as a result of "dirty" tubing. The blank water (ultrapure deionized water) used to evaluate contamination of composite bottles and tubing can also be analyzed in order to check for contamination of this analytical sample medium. Equipment blank "hits" or measured concentrations above the laboratory's quantitation limit (RL, PQL, etc.) for a constituent are assessed and acted upon using the guidelines listed below:

1. The Stormwater Monitoring Program requests that the laboratory confirm the reported results against lab bench sheets or other original analytical instrument output. Any calculation or reporting errors should be corrected and reported by the laboratory in an amended laboratory report.
2. If the previous step does not identify improperly reported results, then the analytical laboratory should be asked to identify any possible sources of contamination in the laboratory.
3. If no laboratory contamination is identified, then a note should be made that documents that the equipment blank results indicate that the sample equipment may have introduced contamination into the blank samples.

When practical, remedial measures are initiated by the Stormwater Monitoring Program to replace or re-clean sampling equipment and re-analyze equipment blank samples in an effort to eliminate field contamination. Only the results of field-initiated and laboratory-initiated QA/QC samples associated with the environmental samples collected for any given monitoring event are used to qualify Stormwater Monitoring Program environmental samples. However, pre-season analyses provide useful information regarding possible sources of environmental sample contamination and insight into how contamination issues might be resolved.

Preseason equipment blank “Carboy Blank” (composite bottle) and “Tubing Blank (distilled)” (intake line cleaned with distilled water only) samples were collected for the 2011/12 monitoring year on August 25, 2011. The “Tubing Blank (distilled)” sample was collected through the intake line at MO-MEI after flushing the line with distilled water. The Carboy Blank samples were split off from ultrapure deionized water that had been added to a clean composite bottle and left to sit at 0 - 4 degrees Celsius for 24 hours. The blanks were analyzed by EPA 200.8 for total metals (iron by EPA 200.7), EPA 245.1 for total mercury, EPA 353.2 for nitrate + nitrite as nitrogen, and EPA 625 for semi-volatile organics.

Constituents that were either not detected or detected below the levels typically found in stormwater and therefore not a cause for concern in both the carboy and tubing blanks were: aluminum, chromium, iron, lead, zinc, and nitrate+nitrite. The amount of mercury detected in each of the equipment blanks (0.023 ug/L) was below the reporting limit and similar to the amount frequently seen in the laboratory’s method blanks, including the method blank for this batch (0.022 ug/L), so the levels could be due to laboratory contamination. Copper was detected in the tubing blank and carboy (DNQ) but below the levels typically found in stormwater, including levels detected in Event 1. Diethyl phthalate was not detected in the composite bottle but was detected in the tubing blank above the reporting limit and at the higher end of the spectrum of environmental results seen in stormwater analysis. However, the detected amount is well below the limit of 120,000 ug/L in the CTR.

Preseason 2 investigated three possible sources of the diethyl phthalate contamination. Samples of the distilled water used for flushing the lines (from each of the two different styles of plastic 5-gallon carboys, “Arrowhead (handle)” and “Arrowhead (old)”), and ultrapure water left for 24 hours in the 2 liter high density polyethylene container used for flushing the lines (“Rinse 2L (plastic)”) were tested by EPA 625. Bis(2-ethylhexyl) phthalate was detected in the Arrowhead (handle) sample above the reporting limit and above the amounts typically seen in stormwater, however almost double the amount seen in this sample was measured in the method blank, so the contamination is likely a laboratory issue. Two contaminants were seen in the Rinse 2L (plastic) sample: diethyl phthalate and di-n-butylphthalate, however both were below the reporting limit and well below the limits in the CTR. To ensure that the risk of contamination is reduced for future events, the Stormwater Monitoring Program purchased fluorinated HDPE 2L containers to replace the 2L HPDE rinse containers previously used by the Program.

Based on these results, the Stormwater Monitoring Program determined that cleaning procedures were adequate and no follow-up was necessary. Furthermore, no environmental samples were qualified by the Stormwater Monitoring Program based on the results of pre-season equipment blank analyses. The cleaning procedures will be reexamined during the preseason tests prior to the 2012/13 monitoring season.

Table 9-4. Constituents Detected in Equipment Blanks Before Event 1

Constituent	Tubing Blank (distilled) Concentration (µg/L)	Carboy Blank Concentration (µg/L)	Reporting Limit (µg/L)	Stormwater Range (when detected) Concentration (µg/L)
Preseason 1				Event 1
Aluminum	7.1	20	5	210 – 18,000
Chromium	0.089*	-	0.2	0.66 – 56
Copper	0.65	0.39*	0.5	1.8 – 120
Iron	4.2*	3.1*	10	910 – 30,000
Lead	0.02*	0.037*	0.2	0.26 – 34
Mercury	0.023*	0.023*	0.050	0.028* - 0.086
Zinc	1.7*	2*	1.1	3.5* – 370
Nitrate+Nitrite as N	-	23*	100	410 – 4,000
Diethyl phthalate	5.7	-	1	0.37* -3.1, 6.1**

Constituent	Arrowhead (handle)	Arrowhead (old)	Rinse 2L (plastic)	Reporting Limit	Stormwater Range (when detected)
	Concentration (µg/L)	Concentration (µg/L)	Concentration (µg/L)	(µg/L)	Concentration (µg/L)
Preseason 2					Event 2
Diethyl phthalate	-	-	0.42*	1	100 – 15,000
Di-n-butylphthalate	-	-	0.25*	1	<0.24 – 0.27*, <2.4
Bis(2-ethylhexyl) phthalate	6.9	-	-	5	<1.1 – 2.6*, <11

* DNQ

** Sample diluted so result is DNQ but reporting limit is higher than undiluted samples

9.4.8 Field and Laboratory Duplicates

Duplicate samples – both field duplicates and lab duplicates – are collected in the field using the same techniques as used for all environmental sample collection. For composite samples, a larger volume of water is collected during the monitoring event and then the duplicates are split in the field (when generating a field duplicate) or in the lab (when generating a lab duplicate) while constantly mixing the contents of the composite containers to ensure the production of homogeneous duplicate samples. The Stormwater Monitoring Program does not collect field duplicates for composite samples as samples are not split in the field due to the risk of sample contamination and breakage. In the case of grab samples, two samples are collected side-by-side or in immediate succession into separate sample bottles when collecting an environmental sample and its field duplicate. Depending on the volume of water required to perform a particular analysis, a lab duplicate analysis of a grab sample may require the collection of additional sample, or may be run on a single environmental sample.

Field duplicate grab samples were collected during Event 1 (MO-VEN) and Event 2 (bacteriologicals at MO-MEI, all others at MO-VEN). Laboratory-initiated laboratory duplicate samples were analyzed on non-project samples for Event 1 – 4. Results are shown in Table 9-5 and Table 9-6. Of the 73 laboratory duplicates, only one was outside the DQO so the overall success rate was 98.6%. Of the 16 field duplicate samples, only one was outside of the DQO and that was fecal coliform at MO-VEN in Event 1 so the field duplicate success rate was 93.8%.

Table 9-5. Field Duplicate Success Rates

Classification	Constituent	Method	Total Samples	Samples Outside DQO	Success Rate
Bacteriological	Total coliform / <i>E. coli</i>	MMO-MUG	4	0	100
Bacteriological	Fecal coliform	SM 9221 E	2	1	50
Conventional	Cyanide	EPA 335.4	2	0	100
Hydrocarbon	Oil and grease/TPH	EPA 1664A	4	0	100
Organic	Various	EPA 524.2	4	0	100

Table 9-6. Laboratory Duplicate Success Rates

Classification	Constituent	Method	Total Samples	Samples Outside DQO	Success Rate
Conventional	Volatile Solids	Suspended EPA 160.4	9	0	100

Conventional	Turbidity	EPA 180.1	9	0	100
Conventional	Alkalinity as CaCO ₃	SM 2320 B	7	0	100
Conventional	Chemical Oxygen Demand	EPA 410.4	7	0	100
Conventional	Specific Conductance	SM 2510 B	8	0	100
Conventional	Total Chlorine Residual	SM 4500-Cl G	2	1	50
Conventional	Total Dissolved Solids	SM 2540 C	13	0	100
Conventional	Total Suspended Solids	SM 2540 D	16	0	100
Conventional	pH	SM 4500-H+ B	1	0	100
Pesticide	Glyphosate	EPA 547	1	0	100

9.4.9 Holding Time Exceedances

The large majority of analytical methods used to analyze water quality samples specify a certain time period in which an analysis must be performed in order to ensure confidence in the result provided from the analysis.¹⁰ A holding time can be either the time between sample collection and sample preparation (the preparation holding time limit) or between the sample preparation and sample analysis (the analysis holding time limit). If a particular sample doesn't require any pre-analysis preparation, then the analysis holding time is the time between sample collection and sample analysis.

These elapsed times are compared to holding time values (typically provided in EPA guidance for analytical methods) to determine if a holding time exceedance has occurred. Elapsed times greater than specified holding time limits are considered to exceed the Stormwater Monitoring Program's DQO for this QA/QC sample type. All holding times were met by laboratories during the 2010/11 monitoring season, with the exceptions as shown in Table 9-7.

Table 9-7. Holding Time Success Rate

Classification	Total Samples	Samples Outside DQO	Success Rate
Anion	162	0	100
Bacteriological	144	0	100
Cation	130	0	100
Conventional	729	18 ^a	97.5
Hydrocarbon	18	0	100
Metal	1779	0	100
Nutrient	438	0	100
Organic	4945	45 ^b	99.1
PCB	378	0	100
Pesticide	5460	0	100

¹⁰ A sample that remains unanalyzed for too long a period of time sometimes shows analytical results different from those that would have been observed had the sample been analyzed earlier in time. This difference is due to the breakdown, transformation, and/or dissipation of substances in the sample over time.

^a Total chlorine residual is a Pollutant of Concern for ME-CC due to the contributions of wastewater treatment plants. The method requires that this constituent be analyzed “immediately” and the permit requires that it be sampled as a composite sample, which combined to result in an exceedance of the hold time for each event. The laboratory analyzed a composite sample from each site for pH although it was not requested on the COC. The holding time for pH is 15 minutes so the samples were analyzed outside of this limit.

^b Two samples were extracted outside of the holding time, affecting 16 constituents. One site was extracted and analyzed within the holding time but required a dilution and re-analysis for 29 constituents which was performed outside of the holding time.

9.4.10 Dilutions

Due to the nature of stormwater matrices, some samples required dilutions prior to analysis. Of the 888 samples that were only qualified due to a dilution, 253 were at or above the reporting level and so were not adversely affected by the raised method detection and reporting limits associated with sample dilution. These samples are considered by the Program to have met all DQOs.

9.4.11 Other QA/QC Methods and Analyses

A variety of other QA/QC methods are used by the Stormwater Monitoring Program and associated laboratories to determine the quality of the data. These include method blanks, matrix spikes and matrix spike duplicates (MS/MSD), surrogate spikes, and laboratory control samples. For many of these, the relative percent difference between two separate samples is computed to determine whether or not the laboratory has achieved the necessary DQO, as described in Section 9.4.6. Results of QA/QC analyses performed on individual samples can be found in Appendix F and Appendix G in Attachment E.

9.4.12 QA/QC Summary

In summary, a total of 11,812 environmental samples were analyzed during the 2011/12 monitoring season. Of these, 10,851 met all DQOs for that particular sample. The Stormwater Monitoring Program’s QA/QC evaluation process identified 961 environmental samples in need of qualification, which translates into the Stormwater Monitoring Program achieving a 91.8% success rate in meeting program data quality objectives. No samples were rejected from the dataset. Received

Overall, the three wet-weather and two dry-weather events monitored per site during the 2011/12 monitoring season produced a high quality data set in terms of the low percentage of qualified data, as well as the low reporting levels achieved by the laboratories analyzing the Stormwater Monitoring Program’s water quality samples.

9.5 WATER QUALITY RESULTS

The NDPES permit requires the Stormwater Monitoring Program to report the results of stormwater monitoring to the Regional Board in two ways. First, within 90 days of a monitoring event, analytical results must be submitted electronically and must highlight elevated constituent levels relative to Basin Plan and CTR acute criteria. The Stormwater Monitoring Program met this requirement for all monitoring events during the 2011/12 season. Second, an Annual Storm Water Report must be submitted by December 15th, and must highlight those same elevated levels relative to applicable water quality objectives. The contents of this report fulfill that requirement.

For the analysis of wet-weather data (Events 1-3), the Basin Plan objectives and the acute, freshwater objectives in the CTR were used. For some constituents, the California Toxics Rule does not contain acute objectives. Previously, and in this monitoring year’s 90 day event reports, the Stormwater Monitoring Program used the

California Toxics Rule Human Health (Organisms Only) objectives for these cases because these constituents had no other objectives for comparison. However, since these objectives are based on long-term exposure and stormwater discharges are of short duration, it was decided that comparing short term stormwater discharges to the long-term chronic criteria was not an accurate representation of the risk of stormwater discharges to Human Health. CTR chronic criteria were not used for wet-weather analyses because acute criteria better reflect the short-term storm event exposure experienced by organisms, as compared to the long-term exposure considered by chronic criteria.

For the analysis of dry-weather data (Event 4), the Basin Plan objectives and the most stringent of the CTR chronic freshwater objectives (Criterion Continuous Concentration), CTR Human Health (Organisms Only), or CTR Human Health (Water & Organisms) were used. Previously, if the CTR did not contain chronic freshwater objectives for a constituent, the CTR Human Health (Organisms Only) was used. In evaluating the criteria, the Stormwater Monitoring Program determined that the MUN designation in the Basin Plan indicates that Human Health Criteria should be considered in evaluating dry-weather exceedances due to their potential for long-term exposure.

The rationale and consequences of this year's changes related to the application of CTR numerical objectives to wet- and dry-weather data are discussed in Section 6.2.

For all events, objectives in the CTR for metals were calculated based on the hardness of the water. This analysis used the hardness value measured at a particular site during a particular monitoring event for calculating a certain metals objective, except when the measured hardness was greater than 400 mg/L. The CTR sets a hardness cap of 400 mg/L for calculating the objectives, so any measured hardness value above 400 mg/L was set equal to 400 mg/L for the purposes of the calculation.

This section presents an evaluation of the data with these water quality objectives (WQOs) and serves, together with the entirety of this Annual Report, as the Receiving Water Limitations report required in Section 3a of Part 2 of the Permit.

9.5.1 Re-evaluation of application of CTR numeric criteria to receiving waters

In previous years, the CTR Numeric Criteria were applied as described on page 30 of the 2010-2011 Water Quality Monitoring Report (Ventura Countywide Stormwater Quality Management Program Annual Report, Attachment F):

“For the analysis of wet-weather data ..., the Basin Plan objectives and the acute, freshwater objectives in the CTR were used. For some constituents, the California Toxics Rule does not contain acute objectives. In these cases, the California Toxics Rule Human Health (Organisms Only) objectives were used in the wet-weather comparison because these constituents have no other objectives for comparison. These objectives were used even though they are based on long-term risks to human health that cannot be directly correlated to stormwater discharges. CTR chronic criteria were not used for wet-weather analyses because acute criteria better reflect the short-term storm event exposure experienced by organisms, as compared to the long-term exposure considered by chronic criteria.

For the analysis of dry-weather data ..., the Basin Plan objectives and the chronic, freshwater objectives in the CTR were used. For some constituents, the CTR does not contain chronic objectives. In these cases, the CTR Human Health (Organisms Only) objectives were used in the dry-weather comparisons because these constituents have no other objectives for comparison.”

However, application of the CTR criteria as detailed above, resulted in inconsistent application of acute and chronic criteria, and inconsistent protection of beneficial uses. For instance, during wet weather the Criterion

Maximum Concentration (CMC) of 1.1 µg/l is applied for 4,4'-DDT, while the Human Health criterion of 0.00059 µg/l is applied for 4,4'-DDE, because a CMC is not listed for the latter. In addition, the selection of the CTR Human Health (Organisms Only) criterion appears inappropriate given that the Ventura County mass emission stations have MUN designated beneficial uses. Therefore, the CTR Human Health (Water + Organisms) criteria are more appropriate.

The new approach to identify water quality exceedances continues to compare the EMC (which for this purpose is the concentration measured in the composite or grab sample collected during the event, as applicable) to water quality standards and can be summarized as follows:

- 1) Wet weather: CTR CMC and Basin Plan criteria apply. The most stringent criterion is used for each constituent in order to identify water quality exceedances. If CMC criteria are not available, no other CTR criteria are substituted.
- 2) Dry weather: all CTR and Basin Plan criteria apply. The most stringent criterion is used for each constituent in order to identify water quality exceedances.

This approach constitutes an improvement over the approach used prior to this year, because:

- Numerical criteria are now consistently applied for all constituents.
- Chronic criteria are not applicable to short-lived storm events. CTR Criterion Continuous Concentrations (CCCs) and Human Health criteria are expressed as 4-day maxima and 30-day averages, and therefore their application to storm events of less than 24 hours is questionable.
- Based on a poll among the Southern California Stormwater Monitoring Coalition (SMC) members, the new approach is in line with the approach taken by most other stormwater agencies in southern California.

Historical data between 2007 and 2012 were analyzed to determine the potential practical impact of the new approach in identifying water quality exceedances at mass emission stations, compared to how exceedances have been reported in the past. In summary, the new approach led to:

- Elimination of wet weather exceedances for total mercury, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, chrysene, 4,4'-DDD and 4,4'-DDE, since CTR human health criteria no longer apply and no other numerical criteria are available.
- Elimination of wet weather exceedances for benzo(a)pyrene due to increase of numerical criterion from 0.049 µg/l (CTR human health, organisms only) to 0.2 µg/l (Basin Plan MCL).
- Increase in dry weather exceedances for bis(2-ethylhexyl)phthalate due to decrease of numerical criterion from 4 µg/l (Basin Plan) to 1.8 µg/l (CTR human health, water + organisms).
- Increase in dry weather exceedances for chrysene and benzo(b)fluoranthene due to decrease of numerical criteria from 0.049 µg/l (CTR human health, organisms only) to 0.0044 µg/l (CTR human health (water + organisms)).

The above analysis retrospectively identified the constituents that were affected by our new approach to determining water quality exceedances. It is reasonable to assume that the implications for the future will be similar. However, this has changed numerical criteria for many other constituents as well, but there were no practical implications for the number of exceedances seen in the 2007 – 2012 data.

9.5.2 Water Quality Objective Exceedances and Elevated Levels

Table 9-8 presents water quality objective exceedances at Mass Emission stations based on an analysis of the 2011/12 wet-season stormwater monitoring data. Constituents that were found at elevated levels¹¹ at sites upstream (i.e., related Major Outfall stations) are shown in bold and highlighted (see Section 9.5.7 through Section 9.5.9 for a discussion of the relationship between the Mass Emission and Major Outfall stations). Table 9-9 presents the elevated levels of constituents at Major Outfall stations based on an analysis of the 2011/12 wet-season stormwater monitoring data. Constituents that exceeded the water quality objective at sites downstream (i.e., related Mass Emission stations) are shown in bold and highlighted (again, see Section 9.5.7 through Section 9.5.9 for a discussion of the relationship between the Mass Emission and Major Outfall stations).

9.5.3 Ventura River Mass Emission Station (ME-VR2) Water Quality Objective Exceedances and Elevated Levels Corrections

The Ventura River Mass Emission station (ME-VR2) was installed during the 2004/05 monitoring year when the original station, ME-VR was decommissioned due to safety concerns as a result of landslide activity. The station was moved approximately one mile downstream to a safe location, while still representative of the runoff of the Ventura River watershed. The new location for the station put it into a different reach of the river according to the Basin Plan (between the confluence with Weldon Canyon and Main Street rather than between Casitas Vista Road and the confluence with Weldon Canyon), with higher limits for total dissolved solids (TDS), sulfate, chloride, boron, and nitrogen. Of these constituents, TDS, chloride, and nitrogen are monitored as part of the NPDES permit by the Stormwater Monitoring Program. The limits in the Program's database were not updated for the new location until the 2011 annual report, and they are now correct for the current location. These changes and revised exceedances were explained in the 2011 annual report.

9.5.4 Salinity Results Correction for Units

While salinity is not a constituent that is required by the permit, it is measured in the field by field crews and has been reported since Event 1 in the 2009/10 monitoring year. The YSI 85 field meter provides the salinity results in units of ppt but the database stores the data in mg/L, the equivalent of ppm (parts per million). The abbreviation ppt was incorrectly translated as parts per trillion instead of parts per thousand. The error was noticed in December 2012 and all data has been updated. Event data submitted in the 2009/10, 2010/11, and 2011/12 monitoring years and the 2009/10 and 2010/11 Annual reports contained the incorrectly translated values. The salinity data in the database and the 2011/12 Annual Report now contain the correct values. This correction does not affect past results reported for the Permit required constituents traditionally categorized as salts: boron, chloride, sulfate, and total dissolved solids.

9.5.5 Urban Runoff Impacts on Receiving Waters

Pursuant to Part 2 of the Permit, the Permittees are required to determine whether discharges from their municipal separate storm sewer systems are causing or contributing to a violation of water quality standards (WQS). Additionally, Permittees are responsible for preventing discharges from the MS4 of stormwater or non-

¹¹ "Elevated levels" is used to describe those concentrations that are above a particular water quality standard. These amounts are not referred to as "exceedances," as has been done for the Mass Emission stations, since, technically, those standards are only applicable to receiving waters, not to the outfalls that were monitored.

stormwater from causing or contributing to a condition of nuisance. Specifically, the Order contains following Receiving Water Limitations Language:

1. Discharges from the MS4 that cause or contribute to a violation of water quality standards are prohibited.
2. Discharges from the MS4 of stormwater, or non-stormwater, for which a Permittee is responsible, shall not cause or contribute to a condition of nuisance.

Compliance with the above Receiving Water Limitations is achieved by the Permittees through implementation of control measures and other actions to reduce pollutants in stormwater and non-stormwater discharges in accordance with the requirements of the Permit. The following section presents a discussion of WQS exceedances that occurred during the three wet-weather and one dry-weather monitoring events during the 2011/12 monitoring year.

9.5.6 “Cause or Contribute” Evaluation Methodology

The evaluation used to determine if a pollutant is persistently causing or contributing to the exceedance of a WQS in receiving waters consists of three steps:

1. The water quality data collected at a mass emission site in the same watershed is used as the receiving water to compare to relevant WQS contained in the CTR and Basin Plan (Section 9.5.1).
2. When a receiving water concentration exceeded a WQS for a particular constituent, the urban runoff concentration of said constituent measured at a Major Outfall in that watershed was compared to the WQS. If an elevated level relative to the associated WQS for said constituent was observed in both urban runoff and the receiving water, then the WQS exceedance in the receiving water was determined “likely caused or contributed to by urban runoff.” However, this comparison does not consider the frequency or persistence of WQS exceedances for a given constituent.
3. The persistence of a WQS exceedance was determined by evaluating the number of times (frequency) that a constituent was observed at an elevated level in urban runoff and in excess of the WQS for the receiving water for a particular type of monitoring event (wet or dry) over the course of the monitoring season. If two or more elevated levels in urban runoff and WQS exceedances in the receiving water were observed for a particular constituent over the course of the monitoring season, then the WQS exceedances of said constituent were determined to be persistent. Ideally, an assessment of persistency would be based on a larger data set (e.g., 10 events or more) and an assumed percentage of exceedances (e.g., 50%), but given the need for an annual assessment two or more exceedances from the existing, limited data set were used as the criterion to determine persistence.

Table 9-8. Water Quality Objective Exceedances at Mass Emission Stations

Site	2011/12-1 (Wet)		2011/12-2 (Wet)		2011/12-3 (Wet)		2011/12-4 (Dry)		Applicable Standard
	Constituent	Value	Constituent	Value	Constituent	Value	Constituent	Value	
ME-CC							Chloride	190	150 mg/L (Basin Plan)
	<i>E. Coli</i>	2063	<i>E. Coli</i>	4352					235 MPN/100 mL (Basin Plan)
	Fecal Coliform	9000	Fecal Coliform	5000					400 MPN/100 mL (Basin Plan)
	Aluminum	7900	Aluminum	9000	Aluminum	13000			1,000 µg/L (Basin Plan)
ME-SCR	<i>E. Coli</i>	2014			<i>E. Coli</i>	292			235 MPN/100 mL (Basin Plan)
	Fecal Coliform	2400							400 MPN/100 mL (Basin Plan)
	Aluminum	10000	Aluminum	5500	Aluminum	75000			1,000 µg/L (Basin Plan)
					Barium	1100			1,000 µg/L (Basin Plan)
					Cadmium	9.9			5 µg/L (Basin Plan)
					Chromium	160			50 µg/L (Basin Plan)
					Nickel	290			100 µg/L (Basin Plan)
ME-VR2			DO	4.95					5 mg/L (Basin Plan)
	<i>E. Coli</i>	2755			<i>E. Coli</i>	5475			235 MPN/100 mL (Basin Plan)
	Fecal Coliform	2400	Fecal Coliform	500	Fecal Coliform	5000			400 MPN/100 mL (Basin Plan)
Note: All metals are total unless otherwise stated									
Highlighted: Elevated level of same constituent in one or more related major outfalls									

Table 9-9. Elevated Levels at Major Outfall Stations

Site	2011/12-1 (Wet)		2011/12-2 (Wet)		2011/12-3 (Wet)		2011/12-4 (Dry)		Standard for Comparison
	Constituent	Value	Constituent	Value	Constituent	Value	Constituent	Value	
MO-CAM							pH	9.85	8.5 pH units (Basin Plan)
	<i>E. Coli</i>	24192	<i>E. Coli</i>	12997	<i>E. Coli</i>	64880			235 MPN/100 mL (Basin Plan)
	Fecal Coliform	24000	Fecal Coliform	16000	Fecal Coliform	90000			400 MPN/100 mL (Basin Plan)
	Aluminum	3400			Aluminum	1200			1,000 µg/L (Basin Plan)
	Copper, dissolved	8.8	Copper, dissolved	8.5	Copper, dissolved	6.2			7.26 µg/L, 4.05 µg/L, 4.73 µg/L, 26.77 µg/L (CTR)*
MO-FIL							Chloride	110	80 mg/L (Basin Plan)
					DO	4.5	DO		5 mg/L (Basin Plan)
	<i>E. Coli</i>	4611			<i>E. Coli</i>	2755	<i>E. Coli</i>	529	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	17000			Fecal Coliform	5000	Fecal Coliform	500	400 MPN/100 mL (Basin Plan)
MO-HUE			DO	4.47	DO	4.86			5 mg/L (Basin Plan)
	<i>E. Coli</i>	12033	<i>E. Coli</i>	5172	<i>E. Coli</i>	8664	<i>E. Coli</i>	1071	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	5200	Fecal Coliform	9000	Fecal Coliform	16000	Fecal Coliform	3000	400 MPN/100 mL (Basin Plan)
					Benzo(a)pyrene	0.23			0.2 µg/L (Basin Plan)
MO-MEI							Chloride	180	60 mg/L (Basin Plan)
							pH	9.86	8.5 pH units (Basin Plan)
							Total Dissolved Solids	820	800 mg/L (Basin Plan)
	<i>E. Coli</i>	198630	<i>E. Coli</i>	72700	<i>E. Coli</i>	18500	<i>E. Coli</i>	1669	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	500000	Fecal Coliform	90000	Fecal Coliform	50000	Fecal Coliform	1400	400 MPN/100 mL (Basin Plan)
	Aluminum	3600	Aluminum	2700	Aluminum	3800			1,000 µg/L (Basin Plan)
			Copper, dissolved	12					10.76 µg/L (CTR)
MO-MPK	<i>E. Coli</i>	155310	<i>E. Coli</i>	23820	<i>E. Coli</i>	98040		Dry	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	900000	Fecal Coliform	50000	Fecal Coliform	90000		Dry	400 MPN/100 mL (Basin Plan)
	Aluminum	11000	Aluminum	2300	Aluminum	4800		Dry	1,000 µg/L (Basin Plan)
			Copper, dissolved	17				Dry	9.99 µg/L (CTR)
	Pentachlorophenol	1.2						Dry	1 µg/L (Basin Plan)

Site	2011/12-1 (Wet)		2011/12-2 (Wet)		2011/12-3 (Wet)		2011/12-4 (Dry)		Standard for Comparison
	Constituent	Value	Constituent	Value	Constituent	Value	Constituent	Value	
MO-OJA			Chloride	74			Chloride	180	60 mg/L (Basin Plan)
							Total Dissolved Solids	940	800 mg/L (Basin Plan)
	<i>E. Coli</i>	14136	<i>E. Coli</i>	17329	<i>E. Coli</i>	24192	<i>E. Coli</i>	43520	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	160000	Fecal Coliform	24000	Fecal Coliform	30000	Fecal Coliform	30000	400 MPN/100 mL (Basin Plan)
	Aluminum	2400	Aluminum	1600	Aluminum	1500			1,000 µg/L (Basin Plan)
MO-OXN							pH	8.87	8.5 pH units (Basin Plan)
	<i>E. Coli</i>	19863	<i>E. Coli</i>	3448	<i>E. Coli</i>	860			235 MPN/100 mL (Basin Plan)
	Fecal Coliform	22000	Fecal Coliform	1700	Fecal Coliform	3000			400 MPN/100 mL (Basin Plan)
	Aluminum	2600			Aluminum	1900			1,000 µg/L (Basin Plan)
	Copper, dissolved	16	Copper, dissolved	13	Copper, dissolved	13			9.35 µg/L , 6.07 µg/L , 8.05 µg/L (CTR)
MO-SIM							Chloride	180	150 mg/L (Basin Plan)
	DO	4.93							5 mg/L (Basin Plan)
							Total Dissolved Solids	1500	850 mg/L (Basin Plan)
	<i>E. Coli</i>	9804	<i>E. Coli</i>	24192	<i>E. Coli</i>	24192	<i>E. Coli</i>	1664	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	50000	Fecal Coliform	60000	Fecal Coliform	50000	Fecal Coliform	3000	400 MPN/100 mL (Basin Plan)
	Aluminum	3700			Aluminum	1200			1,000 µg/L (Basin Plan)
MO-SPA	<i>E. Coli</i>	20460	<i>E. Coli</i>	959	<i>E. Coli</i>	4106		Dry	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	50000	Fecal Coliform	1600	Fecal Coliform	9000		Dry	400 MPN/100 mL (Basin Plan)
	Aluminum	3700	Aluminum	2100	Aluminum	2000		Dry	1,000 µg/L (Basin Plan)
	Copper, dissolved	18	Copper, dissolved	18	Copper, dissolved	13		Dry	11.53 µg/L, 10.12 µg/L, 8.95 µg/L (CTR)
			Bis(2-ethylhexyl)phthalate	5.4				Dry	4 µg/L (Basin Plan)

Site	2011/12-1 (Wet)		2011/12-2 (Wet)		2011/12-3 (Wet)		2011/12-4 (Dry)		Standard for Comparison
	Constituent	Value	Constituent	Value	Constituent	Value	Constituent	Value	
MO-THO							Chloride	250	150 mg/L (Basin Plan)
							Total Dissolved Solids	910	850 mg/L (Basin Plan)
	<i>E. Coli</i>	1793	<i>E. Coli</i>	14136	<i>E. Coli</i>	11199	<i>E. Coli</i>	2481	235 MPN/100 mL (Basin Plan)
	Fecal Coliform	16000	Fecal Coliform	16000	Fecal Coliform	9000	Fecal Coliform	2400	400 MPN/100 mL (Basin Plan)
	Aluminum	18000	Aluminum	1900	Aluminum	4100			1,000 µg/L (Basin Plan)
	Chromium, total	56							50 µg/L (Basin Plan)
MO-VEN							pH	8.69	8.5 pH units (Basin Plan)
	<i>E. Coli</i>	24192	<i>E. Coli</i>	17329	<i>E. Coli</i>	4352			235 MPN/100 mL (Basin Plan)
	Fecal Coliform	2400	Fecal Coliform	16000	Fecal Coliform	14000			400 MPN/100 mL (Basin Plan)
	Aluminum	3900	Aluminum	1300	Aluminum	2300			1,000 µg/L (Basin Plan)
			Copper, dissolved	11			Copper, dissolved	79	7.26 µg/L, 29.29 µg/L, 29.29 µg/L (CTR)
<p>Note: All metals are total unless otherwise stated</p> <p>* CTR objectives for dissolved metals are based on hardness and are, therefore, different for each storm</p> <p>Highlighted: Exceedance of same constituent in related receiving water (mass emission)</p>									

9.5.7 Ventura River Watershed Receiving Water Limit Evaluation

Urban stormwater runoff and urban non-stormwater flows were evaluated at two Major Outfall locations in the Ventura River Watershed during the 2011/12 season: Meiners Oaks-1 (MO-MEI) and Ojai-1 (MO-OJA). Both of these Major Outfalls are located upstream of the ME-VR2 Mass Emission station (see Figure 9.1), and therefore water quality data collected at ME-VR2 were used to represent receiving water quality in the “cause or contribute” evaluation conducted for both Major Outfalls. Table 9-10 and Table 9-11 show the constituents that exceeded WQS in the downstream receiving water and compares them to the levels measured at the Major Outfalls, MO-MEI and MO-OJA, respectively. Receiving water exceedances with corresponding WQS Major Outfall here the urban runoff from both the Major Outfalls were also outside of the WQS are in bold. Receiving water exceedances where the urban runoff from the applicable Major Outfalls was outside of WQS are shown in bold.

Table 9-10: Comparison of MO-MEI and ME-VR2 Relative to Water Quality Standards

Constituent (Unit)	Meiners Oaks-1 Major Outfall (MO-MEI)	Receiving Water (ME-VR2)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	198,630	2,755	235	BP
Fecal Coliform (MPN/100 mL)	500,000	2,400	400	BP
2011/12-2 (Wet) – Jan 21, 2012				
Dissolved Oxygen (mg/L)	9.77	4.95	5	BP
Fecal Coliform (MPN/100 mL)	90,000	500	400	BP
2011/12-3 (Wet) – Mar 17, 2012				
E. coli (MPN/100 mL)	18,500	5,475	235	BP
Fecal Coliform (MPN/100 mL)	50,000	5,000	400	BP

Table 9-11: Comparison of MO-OJA and ME-VR2 Relative to Water Quality Standards

Constituent (Unit)	Ojai-1 Major Outfall (MO-OJA)	Receiving Water (ME-VR2)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	14,136	2,755	235	BP
Fecal Coliform (MPN/100 mL)	160,000	2,400	400	BP
2011/12-2 (Wet) – Jan 21, 2012				
Dissolved Oxygen (mg/L)	10.19	4.95	5	BP
Fecal Coliform (MPN/100 mL)	24,000	500	400	BP
2011/12-3 (Wet) – Mar 17, 2012				
E. coli (MPN/100 mL)	24,192	5,475	235	BP
Fecal Coliform (MPN/100 mL)	30,000	5,000	400	BP

9.5.8 Santa Clara River Watershed Receiving Water Limit Evaluation

Urban stormwater runoff and urban non-stormwater flows were evaluated at four Major Outfalls in the Santa Clara River Watershed during the 2011/12 season: Fillmore-1 (MO-FIL), Santa Paula-1 (MO-SPA), Oxnard-1 (MO-OXN), and Ventura-1 (MO-VEN). Two of these stations, MO-FIL and MO-SPA, are located upstream of the ME-SCR Mass Emission station (see Figure 9.1), and therefore water quality data collected at ME-SCR were used to represent receiving water quality in the “cause or contribute” evaluation conducted for both Major Outfalls. The other two stations, MO-OXN and MO-VEN, are located downstream of the ME-SCR Mass Emission station (see Figure 9.1). Because the ME-SCR station is located upstream of MO-OXN and MO-VEN, an assumption was required so that water quality data collected at ME-SCR could be considered to adequately represent Santa Clara River water quality downstream of the confluence of both MO-OXN and MO-VEN with the river. For comparison purposes it was assumed that pollutant concentrations in the Santa Clara River downstream of ME-SCR remain the same as those measured at ME-SCR to a hypothetical compliance point below the confluence of MO-OXN and MO-VEN and the Santa Clara River. With this assumption in effect, water quality data collected at ME-SCR were used to represent receiving water quality in the “cause or contribute” evaluation conducted for the MO-OXN and MO-VEN stations. Constituents exceeding WQS at the receiving water were compared to the urban runoff levels at the MO-FIL, MO-SPA, MO-OXN, and MO-VEN stations and are shown in Table 9-12 through Table 9-15 below. Receiving water exceedances where the urban runoff from the applicable Major Outfalls was outside of WQS are shown in bold.

Table 9-12: Comparison of MO-FIL and ME-SCR Relative to Water Quality Standards

Constituent (Unit)	Fillmore-1 Major Outfall (MO-FIL)	Receiving Water (ME-SCR)	Water Quality Standard (Basin Plan or CTR)
2011/12-1 (Wet) – Oct. 5, 2011			
E. coli (MPN/100 mL)	4,611	2,014	235 BP
Fecal Coliform (MPN/100 mL)	17,000	2,400	400 BP
Aluminum, Total (µg/L)	620	10,000	1,000 BP
2011/12-2 (Wet) – Jan. 21, 2012			
Aluminum, Total (µg/L)	650	5,500	1,000 BP
2011/12-3 (Wet) – Mar. 17, 2012			
E. coli (MPN/100 mL)	2,755	292	235 BP
Aluminum, Total (µg/L)	590	75,000	1,000 BP
Barium, Total (µg/L)	NS	1,100	1,000 BP
Cadmium, Total (µg/L)	0.4	9.9	5 BP
Chromium, Total (µg/L)	2.7	160	50 BP
Nickel, Total (µg/L)	3.6	290	100 BP

Table 9-13: Comparison of MO-SPA and ME-SCR Relative to Water Quality Standards

Constituent (Unit)	Santa Paula-1 Major Outfall (MO-SPA)	Downstream Receiving Water (ME-SCR)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	20,460	2,014	235	BP
Fecal Coliform (MPN/100 mL)	50,000	2,400	400	BP
Aluminum, Total (µg/L)	3,700	10,000	1,000	BP
2011/12-2 (Wet) – Jan. 21, 2012				
Aluminum, Total (µg/L)	2,100	5,500	1,000	BP
2011/12-3 (Wet) – Mar. 17, 2012				
E. coli (MPN/100 mL)	4,106	292	235	BP
Aluminum, Total (µg/L)	2,000	75,000	1,000	BP
Barium, Total (µg/L)	NS	1,100	1,000	BP
Cadmium, Total (µg/L)	0.52	9.9	5	BP
Chromium, Total (µg/L)	5	160	50	BP
Nickel, Total (µg/L)	8	290	100	BP

Table 9-14: Comparison of MO-OXN and ME-SCR Relative to Water Quality Standards

Constituent (Unit)	Receiving Water (ME-SCR) ^a	Oxnard-1 Major Outfall (MO-OXN)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	2,014	19,863	235	BP
Fecal Coliform (MPN/100 mL)	2,400	22,000	400	BP
Aluminum, Total (µg/L)	10,000	2,600	1,000	BP
2011/12-2 (Wet) – Jan. 21, 2012				
Aluminum, Total (µg/L)	5,500	970	1,000	BP
2011/12-3 (Wet) – Mar. 17, 2012				
E. coli (MPN/100 mL)	292	860	235	BP
Aluminum, Total (µg/L)	75,000	1,900	1,000	BP
Barium, Total (µg/L)	1,100	NS	1,000	BP
Cadmium, Total (µg/L)	9.9	0.44	5	BP
Chromium, Total (µg/L)	160	5.8	50	BP
Nickel, Total (µg/L)	290	8.6	100	BP

^a Water quality monitoring data collected at ME-SCR were used in the receiving water “cause or contribute” evaluation as downstream surrogate data to represent the water quality in the Santa Clara River at a compliance point below the confluence of MO-OXN and the Santa Clara River.

^b Site-specific Basin Plan objective for reach of Santa Clara River where ME-SCR is located.

^c Recommended objective (MUN drinking water objective, USEPA secondary MCL) for sites without a site-specific Basin Plan objective.

Table 9-15: Comparison of MO-VEN and ME-SCR Relative to Water Quality Standards

Constituent (Unit)	Receiving Water (ME-SCR) ^a	Ventura-1 Major Outfall (MO-VEN)	Water Quality Standard (Basin Plan or CTR)
2011/12-1 (Wet) – Oct. 5, 2011			
E. coli (MPN/100 mL)	2,014	24,192	235 BP
Fecal Coliform (MPN/100 mL)	2,400	2,400	400 BP
Aluminum, Total (µg/L)	10,000	3,900	1,000 BP
2011/12-2 (Wet) – Jan. 21, 2012			
Aluminum, Total (µg/L)	5,500	1,300	1,000 BP
2011/12-3 (Wet) – Mar. 17, 2012			
E. coli (MPN/100 mL)	292	4,352	235 BP
Aluminum, Total (µg/L)	75,000	2,300	1,000 BP
Barium, Total (µg/L)	1,100	NS	1,000 BP
Cadmium, Total (µg/L)	9.9	0.39	5 BP
Chromium, Total (µg/L)	160	5.7	50 BP
Nickel, Total (µg/L)	290	9.1	100 BP

^a Water quality monitoring data collected at ME-SCR were used in the receiving water “cause or contribute” evaluation as downstream surrogate data to represent the water quality in the Santa Clara River at a compliance point below the confluence of MO-VEN and the Santa Clara River.

9.5.9 Calleguas Creek Watershed Receiving Water Limit Evaluation

Urban stormwater runoff and urban non-stormwater flows were evaluated at four Major Outfalls in the Calleguas Creek Watershed during the 2011/12 season: Camarillo-1 (MO-CAM), Moorpark-1 (MO-MPK), Simi Valley-1 (MO-SIM), and Thousand Oaks-1 (MO-THO). Three of these Major Outfalls (MO-MPK, MO-SIM, and MO-THO) are located upstream of the ME-CC Mass Emission station (see Figure 9.1), and therefore water quality data collected at ME-CC were used to represent receiving water quality in the “cause or contribute” evaluation conducted for these Major Outfalls. As stated earlier, MO-CAM is located in a different subwatershed than the closest receiving water location, the ME-CC station, monitored by the Program (see Figure 9.1). MO-CAM is tributary to Revolon Slough, which is tributary to Calleguas Creek several miles downstream of ME-CC. Similar to the ME-SCR station in the Santa Clara River watershed, an assumption was made so that water quality data collected at ME-CC could be considered to adequately represent Calleguas Creek water quality downstream of the confluence of Revolon Slough and the creek. It was assumed that pollutant concentrations in Calleguas Creek downstream of ME-CC remain the same as those measured at ME-CC to a hypothetical compliance point below the confluence of Revolon Slough and Calleguas Creek. With this assumption in effect, water quality data collected at ME-CC were used to represent receiving water quality in the “cause or contribute” evaluation conducted for the MO-CAM Major Outfall. Constituents exceeding WQS at the receiving water were compared to the urban runoff levels at the MO-MPK, MO-SIM, MO-THO, and MO-CAM stations and are shown in

Table 9-16,

Table 9-17, Table 9-18, and Table 9-19 below. Receiving water exceedances where the urban runoff from the applicable Major Outfalls was outside of WQS are shown in bold.

Table 9-16: Comparison of MO-MPK and ME-CC Relative to Water Quality Standards

Constituent (Unit)	Moorpark-1 Major Outfall (MO-MPK)	Receiving Water (ME-CC)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	155,310	2,063	235	BP
Fecal Coliform (MPN/100 mL)	900,000	9,000	400	BP
Aluminum, Total (µg/L)	11,000	7,900	1,000	BP
2011/12-2 (Wet) – Jan. 21, 2012				
E. coli (MPN/100 mL)	23,820	4,352	235	BP
Fecal Coliform (MPN/100 mL)	50,000	5,000	400	BP
Aluminum, Total (µg/L)	2,300	9,000	1,000	BP
2011/12-3 (Wet) – Mar. 17, 2012				
Aluminum, Total (µg/L)	4,800	13,000	1,000	BP
2011/12-4 (Dry) – Apr. 24, 2012				
Chloride (mg/L)	DRY	190	150	BP

Table 9-17: Comparison of MO-SIM and ME-CC Relative to Water Quality Standards

Constituent (Unit)	Simi Valley-1 Major Outfall (MO-SIM)	Receiving Water (ME-CC)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	9,804	2,063	235	BP
Fecal Coliform (MPN/100 mL)	50,000	9,000	400	BP
Aluminum, Total (µg/L)	3,700	7,900	1,000	BP
2011/12-2 (Wet) – Jan. 21, 2012				
E. coli (MPN/100 mL)	24,192	4,352	235	BP
Fecal Coliform (MPN/100 mL)	60,000	5,000	400	BP
Aluminum, Total (µg/L)	970	9,000	1,000	BP
2011/12-3 (Wet) – Mar. 17, 2012				
Aluminum, Total (µg/L)	1,200	13,000	1,000	BP
2011/12-4 (Dry) – Apr. 24, 2012				
Chloride (mg/L)	180	190	150	BP

Table 9-18: Comparison of MO-THO and ME-CC Relative to Water Quality Standards

Constituent (Unit)	Thousand Oaks-1 Major Outfall (MO-THO)	Receiving Water (ME-CC)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	1,793	2,063	235	BP
Fecal Coliform (MPN/100 mL)	16,000	9,000	400	BP
Aluminum, Total (µg/L)	18,000	7,900	1,000	BP
2011/12-2 (Wet) – Jan. 21, 2012				
E. coli (MPN/100 mL)	14,136	4,352	235	BP
Fecal Coliform (MPN/100 mL)	16,000	5,000	400	BP
Aluminum, Total (µg/L)	1,900	9,000	1,000	BP
2011/12-3 (Wet) – Mar. 17, 2012				
Aluminum, Total (µg/L)	4,100	13,000	1,000	BP
2011/12-4 (Dry) – Apr. 24, 2012				
Chloride (mg/L)	250	190	150	BP

Table 9-19: Comparison of MO-CAM and ME-CC Relative to Water Quality Standards

Constituent (Unit)	Receiving Water (ME-CC) ^a	Camarillo-1 Major Outfall (MO-CAM)	Water Quality Standard (Basin Plan or CTR)	
2011/12-1 (Wet) – Oct. 5, 2011				
E. coli (MPN/100 mL)	2,063	24,192	235	BP
Fecal Coliform (MPN/100 mL)	9,000	24,000	400	BP
Aluminum, Total (µg/L)	7,900	3,400	1,000	BP
2011/12-2 (Wet) – Jan. 21, 2012				
E. coli (MPN/100 mL)	4,352	12,997	235	BP
Fecal Coliform (MPN/100 mL)	5,000	16,000	400	BP
Aluminum, Total (µg/L)	9,000	820	1,000	BP
2011/12-3 (Wet) – Mar. 17, 2012				
Aluminum, Total (µg/L)	13,000	1,200	1,000	BP
2011/12-4 (Dry) – Apr. 24, 2012				
Chloride (mg/L)	190	140	150	BP

^a Water quality monitoring data collected at ME-CC were used in the receiving water “cause or contribute” evaluation as downstream surrogate data to represent the water quality in Calleguas Creek at a compliance point below the confluence of Revolon Slough and Calleguas Creek. The MO-Cam station is tributary to Revolon Slough.

^b Site-specific Basin Plan objective for reach of Calleguas Creek where ME-CC is located.

^c Site-specific Basin Plan objective for Revolon Slough.

9.5.1 Coastal Watershed

Urban stormwater runoff and urban non-stormwater flows were evaluated at one Major Outfall station that does not have an associated Mass Emissions station located within the watershed. The MO-HUE station is located in Port Hueneme and discharges to the J Street Drain just upstream of where the drain enters the Ormond Beach lagoon. The elevated levels seen at MO-HUE are listed in Table 9-9 and not in a separate table as there is not a Mass Emission station nearby to which comparisons would be relevant.

9.5.2 Discussion of Results above Water Quality Standards

Aluminum, *E. coli* and fecal coliforms were commonly found at elevated levels at most sites during wet-weather events, but with the exception of *E. coli*, rarely during dry-weather events. Other constituents that were found at elevated levels during the 2011/12 monitoring season include chloride and total dissolved solids (predominantly during the dry-weather event); dissolved oxygen; dissolved copper; and pH (dry weather). Constituents that were seen at elevated levels at Major Outfalls only once during the season include total chromium, bis(2-ethylhexyl)phthalate, benzo(a)pyrene, and pentachlorophenol. Constituents that were seen at elevated levels at Mass Emission stations only once during the season include the metals (total) barium, cadmium, chromium, and nickel. The Program is using this information to identify pollutants of concern and direct efforts to reduce their discharge from the storm drain system.

Pathogen Indicators

Urban runoff concentrations of *E. coli* and fecal coliform bacteria were detected above their respective Basin Plan objectives during all three wet weather events at all but one Major Outfall station during the 2011/12 season, with the exception being MO-FIL during Event 2, where *E. coli* and fecal coliform bacteria were both below the objectives. Wet weather receiving water exceedances were less consistent, with all three sites above the objectives for both *E. coli* and fecal coliform bacteria during Event 1, two sites (ME-CC and ME-VR2) exceeding the fecal coliform bacteria objectives for Event 2 and one site (ME-VR2) for Event 3. The *E. coli* objectives were exceeded during Event 2 at ME-CC and Event 3 at ME-SCR and ME-VR2. These indicator bacteria are routinely measured at concentrations in excess of WQS during wet weather events. The story improves, however, with regard to dry weather monitoring during the 2011/12 season. No dry weather bacteria exceedances were observed at any of the receiving water stations. The majority of Major Outfall stations exhibited concentrations of fecal indicator bacteria above Basin Plan objectives during dry weather monitoring. The exceptions include no elevated levels observed for MO-CAM, MO-OXN, and MO-VEN during Event 4. A lack of flow at MO-MPK and MO-SPA precluded dry event sample collection at these sites.

However, the elevated levels are not reflected in the water quality of the beaches. The results of the Beach Water Quality Monitoring Program in Ventura County has been outstanding with Heal the Bay's 2012 *End of Summer Beach Report Card* stating "Overall water quality at beaches throughout Ventura County remains among the best in the state. All monitored beaches received A grades in this report."

Table 9-20 Pathogen indicators detected above Basin Plan Objective

Pathogen indicators detected above Basin Plan Objective				
Site	Event 1 (Wet)	Event 2 (Wet)	Event 3 (Wet)	Event 4 (Dry)
Calleguas Creek Watershed				
Outfalls not causing or contributing to exceedance – Event 3 (Wet) and Event 4 (Dry)				
ME-CC	X	X		
MO-CAM	X	X	X	
MO-MPK	X	X	X	Dry
MO-SIM	X	X	X	X
MO-THO	X	X	X	X
Santa Clara River Watershed				
Outfalls not causing or contributing to exceedance – Event 2 (Wet) and Event 4 (Dry)				
ME-SCR	X		<i>E. coli</i> only	
MO-FIL	X		X	X
MO-OXN	X	X	X	
MO-SPA	X	X	X	Dry
MO-VEN	X	X	X	
Ventura River Watershed				
Outfalls not causing or contributing to exceedance – Event 4 (Dry)				
ME-VR2	X	Fecal only	X	
MO-OJA	X	X	X	X
MO-MEI	X	X	X	X
Coastal Watershed				
Unknown if outfall causing or contributing to exceedance				
MO-HUE	X	X	X	X
Dry – Not sampled during this event due to insufficient flow at site				

The stormwater program has in place control strategies that directly address indicator bacteria concentrations in urban runoff. The existing Program includes a comprehensive residential public outreach program that uses radio, newspaper, online banners, outdoor bulletins, and transit shelters to educate the public about preventing animal waste from entering storm drains. The pollutant outreach campaign was expanded in 2009 to include the mailing of a brochure to horse owners, equestrians and horse property owners. The brochure identified BMPs that horse owners should take to reduce bacteria in stormwater runoff. In 2012, County of Ventura and Ventura County Resources Conservation District initiated an outreach effort to horse and livestock owners in Ventura River Watershed to educate about water quality issues and encourage implementation of best management practices to reduce nutrient and bacteria loads from their discharge. Finally, the Program also conducts outreach to reduce bacteria and nutrients in runoff from pet waste. Section 3 - Public Outreach describes in detail the outreach conducted during the 2011/12 year. The Permittees install dispensers for pet waste pickup bags at beaches, parks and trail heads. It is estimated that over 2 million pet waste bags are given out each year and there are now close to 400 pet waste bag dispensers throughout the County encouraging pet owners to pick up after their pets.

The efforts of the Illicit Discharges/Illicit Connections Program also help to reduce bacteria in stormwater runoff by identifying and stopping illicit wastewater discharges. Eliminating illicit discharges not only protects water quality by eliminating the bacteria in the discharge, but also eliminates the ability for the discharge to pick up and transport bacteria on its way to the storm drain system. The indicator bacteria are also found to thrive in natural environments and sediments. The prevention of the transport of sediments includes steps to remove sediment

from the storm drain system through street sweeping, catch basin cleaning, debris basin maintenance and publicly owned BMPs. Industrial and commercial inspections, construction inspection, and illicit discharge response and elimination represent significant efforts towards eliminating the discharge metals. These are covered respectively in Section 7 - Public Agency Activities, Section 4 Industrial/Commercial Facilities Programs, Section 6 - Development Construction, and Section 8 - Illicit Connections and Illicit Discharges Elimination. Some Permittees conducted field efforts to track bacteriological contamination detected at the Major Outfalls. General conclusions were that the data evaluation did not indicate specific sources as elevated concentrations were determined throughout the tested subwatershed areas.

In addition to the municipal stormwater program, bacteria are being addressed through the TMDL programs in Malibu Creek, Miscellaneous Ventura Coastal Watersheds (Hobie and Kiddie Beaches), and Santa Clara River. Various reaches of Calleguas Creek and Ventura River are listed on the Section 303(d) list due to indicator bacteria impairment. The Malibu Creek and Ventura Coastal beaches Bacteria TMDLs have been in effect since January 24, 2006 and December 18, 2008, respectively. Implementation Plans for both dry-weather and wet-weather were prepared and submitted for both TMDLs and compliance monitoring has been conducted at Malibu Creek and Ventura Coastal beaches since 2007 and 2009, respectively. The Santa Clara River Bacteria TMDL went into effect on March 21, 2012 and a compliance monitoring plan and TMDL implementation plan are under development by the responsible parties according to the TMDL schedule. Addressing bacteriological impairments in the watershed is a challenging task. A number of BMPs implemented in Calleguas Creek and Ventura River watersheds to meet compliance with other TMDLs also address bacteriological impairment such as prohibition of illicit discharge or implementation of LID/Green Street retrofits. Calleguas Creek TMDL MOA group developed a draft Bacteria Work Plan to address this problematic pollutant in the Calleguas Creek Watershed.

Bacteriological contamination is a common occurrence throughout California and the United States. However, it is a challenging task to determine the actual impact to beneficial uses and levels causing human health risk during recreational activities in a watershed. The water quality monitoring standards are based on indicator organisms, not the actual pathogenic bacteria. As a result, it is difficult to ascertain whether a particular water concentration of mostly non-pathogenic indicator bacteria will cause human illness. Adding to the complexity is the fact that wildlife and other naturally occurring sources contribute to bacterial sources. Naturally occurring sources of bacteria have the potential to impact human health, but are extremely difficult to control.

Developing control measures to reduce observed bacteria concentrations to meet water quality standards is challenging. Treatment measures to address bacteria are likely to be costly and difficult to implement (especially with respect to infrequent and short-term, but high volume events that compose stormwater runoff). As a result, implementing measures that will result in compliance with the existing water quality objectives at all times will be extremely difficult. Consequently, the tasks in the Calleguas Creek Draft Bacteria Work Plan are designed to address these complexities to the greatest extent possible and provide mechanisms for protecting the identified beneficial uses in the watershed as is feasible. The strategy outlined in this draft work plan will assess the beneficial uses and risks to human health from bacteria and use that information to develop a TMDL to address bacteriological impairments. In the near-term an educational program focusing on the requirements of local domestic animal waste ordinances and the effects of domestic animal waste on the watershed is being considered¹². Like the metals TMDL, it is expected that the results from the bacteria TMDL will assist the municipal stormwater program in addressing this problematic pollutant because the successful efforts in Calleguas Creek can be applied throughout the County to address indicator bacteria.

¹² <http://www.calleguascreek.org/ccwmp/4f.asp> November 3, 2011.

As a means to better refine the implementation of BMPs that might result in additional reductions of indicator bacteria, the Permittees are evaluating source identification monitoring at Major Outfalls. This may include source tracking through additional sampling for indicator species or using Bacteroidales genetic markers to identify the source(s) of fecal bacteria. Such an approach was used in the Calleguas Creek watershed as part of the draft TMDL Work Plan initial monitoring effort where a source identification study was performed and modeling to allow evaluation of BMPs. Knowing what bacteria sources – agriculture (horse and/or cow), humans, dogs, and birds – are responsible for the high levels of indicator bacteria measured during storm events will assist in the selection of BMPs better suited to control a particular bacteria source. During summer of 2012, County of Ventura and VCWPD worked with SCCWRP to conduct a comprehensive water quality monitoring to determine bacteria sources and to assess the risk to swimmers' health recreating at Hobie and Kiddie beaches. The human markers were detected and additional work is being conducted to further reduce and eliminate anthropogenic sources.

These complex issues related to bacteriological contamination and impairment of beneficial uses have been considered and still need to be discussed among the regulators, regulated communities, and environmental groups with a goal to identify cost-effective water quality protective solutions in the near future.

Trace Metals

Aluminum

Urban runoff and receiving water concentrations of aluminum were found above the 1,000 µg/L Basin Plan objective at the majority of Major Outfall stations for one or more wet weather monitoring events during the 2011/12 season. Similarly, aluminum concentrations above the Basin Plan objective were measured at the ME-CC and ME-SCR receiving water stations during one or more wet events. Receiving water stations ME-CC and ME-SCR yielded aluminum results above WQO during the three wet weather monitoring events (Events 1-3) but not during the one dry weather monitoring event (Event 4) conducted during the current monitoring season. Major Outfall stations not showing wet weather aluminum above the WQS in the Calleguas Creek Watershed include MO-CAM (Event 2) and MO-SIM (Event 2); and in the Santa Clara River Watershed include MO-FIL (Events 1-3) and MO-OXN (Event 2). The only receiving water station not showing wet weather exceedances for aluminum was ME-VR2 (all wet events). A summary of those monitoring sites where aluminum concentrations were observed above the Basin Plan objective is shown in Table 9-21.

Since the Program began monitoring for aluminum in 2004, it has frequently observed elevated levels of the Basin Plan objective for the metal at all Program monitoring sites (receiving water and land use). Aluminum is found as a ubiquitous natural element in sediments throughout Ventura County geology. These sediments are mobilized during stormwater runoff events from urban, agriculture, and natural sources resulting in concentrations of aluminum in excess of the Basin Plan objective. This is clearly shown by the highly elevated wet weather concentrations of the metal measured in all three watersheds monitored by the Program. Similar to the current season, dry weather aluminum concentrations observed above WQS during the past eight years have only been observed a limited number of times. With elevated levels of aluminum co-occurring in both urban runoff and receiving waters within the same watershed during the same monitoring event, it is likely that concentrations of aluminum in urban runoff can be considered contributing to the elevated level observed in receiving waters.

Aluminum is a natural component of silt and clay, and concentrations in Southern California soils routinely exceed 3% (30,000 µg/g).¹³ In addition, wet-weather total aluminum concentrations are significantly correlated

¹³ Shacklette, H. T. and Hansford, J. G. (1984). Elemental concentrations in soils and other surficial materials of the conterminous United

with Total Suspended Solids (TSS) concentrations. Given that a TSS concentration of 500 mg/L result in an aluminum concentration of 15,000 µg/L in the water column, assuming all TSS originate from natural soils, it is reasonable to conclude that aluminum exceedances can readily be caused by erosion of the natural landscape.

Table 9-21 Aluminum detected above Basin Plan Objective

Aluminum detected above Basin Plan Objective				
Site	Event 1 (Wet)	Event 2 (Wet)	Event 3 (Wet)	Event 4 (Dry)
Calleguas Creek Watershed				
ME-CC	X	X	X	
MO-CAM	X		X	
MO-MPK	X	X	X	Dry
MO-SIM	X		X	
MO-THO	X	X	X	
Santa Clara River Watershed				
ME-SCR	X	X	X	
MO-FIL				
MO-OXN	X		X	
MO-SPA	X	X	X	Dry
MO-VEN	X	X	X	
Ventura River Watershed				
Outfalls not causing or contributing to exceedance				
ME-VR2				
MO-OJA	X	X	X	
MO-MEI	X	X	X	
Dry – Not sampled during this event due to insufficient flow at site				

Copper

Based on the “cause or contribute” methodology, copper from urban outfalls was not determined to be a persistent cause or contribution of WQS exceedances. Elevated levels compared to the hardness-based CTR objective for dissolved copper were observed at Major Outfall stations during both wet and dry monitoring events: MO-CAM (Events 1-3), MO-MEI (Event 2), MO-MPK (Event 2), MO-OXN (Events 1-3), MO-SPA (Events 1-3), and MO-VEN (Events 2 and 4). No results above the CTR criterion for dissolved copper were observed at the receiving water stations during the 2011/12 season. Because results for copper were not observed above the CTR criterion in receiving waters (i.e., measured at the receiving water stations), there is no evidence to conclude that copper in urban runoff appreciably impacted receiving water beneficial uses during the 2011/12 monitoring season.

This conclusion does not mean these data will be ignored by the Program as it is actively addressing copper. Permittees supported the Brake Pad Partnership and Senate Bill (SB) 346 adopted September 27, 2010 – that authorized legislation to phase out the copper contained in vehicle brake pads. SB 346, authored by Senator Christine Kehoe (D-San Diego), requires brake pad manufacturers to reduce the use of copper in brake pads sold in California to no more than 5% by 2021 and no more than 0.5% by 2025. This true source control action will help significantly reduce copper in urban runoff. Several of the Major Outfall sites are next to freeways or railroad lines (MO-CAM, MO-OXN, MO-SPA, and MO-VEN)) where copper-containing dust from vehicles and trains is continually produced and deposited; the SB346 legislation will help address this issue. In the future, similar legislation to address train brake pads may help to further reduce copper in runoff.

Table 9-22 Dissolved Copper detected above CTR Objective

Copper detected above Basin Plan Objective				
Site	Event 1 (Wet)	Event 2 (Wet)	Event 3 (Wet)	Event 4 (Dry)
Calleguas Creek Watershed Outfalls not causing or contributing to exceedance				
ME-CC				
MO-CAM	X	X	X	
MO-MPK		X	X	Dry
MO-SIM				
MO-THO				
Santa Clara River Watershed Outfalls not causing or contributing to exceedance				
ME-SCR				
MO-FIL				
MO-OXN	X	X	X	
MO-SPA	X	X	X	Dry
MO-VEN		X		X
Ventura River Watershed Outfalls not causing or contributing to exceedance				
ME-VR2				
MO-OJA				
MO-MEI		X		
Dry – Not sampled during this event due to insufficient flow at site				

Mercury

This year, the Program revised the method in which data is compared to CTR criteria, including the objectives for mercury. Previously, the Program used the Basin Plan Objectives (wet and dry weather), and CTR acute freshwater criteria (wet weather) or CTR chronic freshwater criteria (dry weather) to analyze the data. For constituents without a CTR freshwater objective, the CTR Human Health (Organisms Only) objectives were used. The updated method continues to compare wet weather results to the freshwater acute criteria but if the constituent does not have an acute criterion, the chronic Human Health criteria are no longer used because they are based on long term, continuous exposure, which is inappropriate for storm water. For dry weather, chronic criteria are appropriate so the data is compared to the most stringent of the CTR chronic freshwater, Human

Health (Water & Organisms), or Human Health (Organisms Only). This revision more accurately reflects the MUN designation of the outfalls and receiving waters.

No elevated mercury levels were observed above the Basin Plan Objective (2000 ng/L) at any of the major outfalls or receiving water stations during wet and dry weather for the 2011/12 season. The CTR does not have a freshwater acute criterion for mercury, so there were no wet weather mercury exceedances of the CTR. There were also no exceedances of the most stringent CTR chronic criteria (Human Health – Water & Organisms) during dry weather. Based on the findings of this season, the Program does not consider mercury at this time to constitute a persistent pollutant in urban runoff that is causing or contributing to impairments of beneficial uses in the Ventura River Watershed, Santa Clara River Watershed, or Calleguas Creek Watershed.

Other Metals

The Basin Plan objectives were exceeded at ME-SCR during Event 3 for total barium¹⁴, cadmium, chromium, and nickel concentrations. This was the only occurrence of elevated levels of these metals at any of the Program's sites for the 2011/12 monitoring year (with the exception of chromium at MO-THO in Event 1). Barium, chromium, and nickel were last above the WQS at ME-SCR in Event 2003/04-1, Event 2004/05-4, and Event 2006/07-3, respectively. Cadmium has been detected above the WQS in 8 of 60 samples since 2001, with the detections spread out over the decade. The associated Major Outfalls do not appear to have caused or contributed to the exceedance of the WQS, since concentrations were consistently below the WQS. Moreover, the total cadmium, chromium and nickel concentrations during Event 3 were similar to those during the other events, and concentrations were not higher at MO-FIL and MO-SPA compared to other outfall stations.

The exact sources of the cadmium, nickel and chromium exceedances at ME-SCR during Event 3 are elusive. However, as these metals are strongly correlated to TSS, they may be at least in part related to the elevated TSS concentrations observed during Event 3. Potential anthropogenic sources of cadmium, chromium and nickel in urbanized watersheds include roof runoff (from roof materials, industrial emissions deposits or atmospheric deposition)^{15,16} and road/highway runoff (fuels and engine oils, exhaust emissions, tire and brake wear).¹⁷

Efforts to reduce metals in urban runoff

Because metals are associated with sediment, the Stormwater Program has a number of control measures and BMPs that address metals in general, and sediment specifically. These control measures include steps to remove sediment from the storm drain system through street sweeping, catch basin cleaning, debris basin maintenance and publicly owned BMPs. A thorough discussion of these programs is provided in Section 7 Public Agency Activities. Preventing sediments containing metals from entering the storm drain system is just as, if not more important than removing them after they enter the storm drain system. Industrial and commercial inspections, construction inspection, and illicit discharge response and elimination, are significant efforts targeted at eliminating the discharge of metals. These are covered respectively in Sections 4 Industrial/Commercial Facilities

¹⁴ Currently, barium is only analyzed at ME-SCR and ME-CC.

¹⁵ Van Metre, P. C. and Mahler, B. J. (2003). The contribution of particles washed from rooftops to contaminant loading to urban streams, *Chemosphere* 52:1727-1741.

¹⁶ http://www.sanjoseca.gov/esd/stormwater/PDFs/RoofRunoffFactSheet_4-08.pdf

¹⁷ Opher, T. and Friedler, E. (2010). Factors affecting highway runoff quality, *Urban Water Journal* 7:155-172.

Programs, Section 6 Development Construction, and Section 8 Illicit Connections and Illicit Discharges Elimination.

In addition, the construction program element is structured to address sediment from construction sites and includes review of grading plans, requirements for sediment and erosion control BMPs, and field inspections to confirm BMP implementation. More recently the State Water Resources Control Board adopted WDR Order 2009-0009 DWQ, the Construction General Permit, which covers all construction sites with greater than one acre of active land disturbance. The new Construction General Permit incorporates a risk-based approach to address pollutants from construction sites including sediments and associated metals. The Construction General Permit includes rigorous site planning, numeric effluent and action limits, and minimum BMPs as a function of the site risk for discharging sediment. It is expected that this new Construction General Permit will provide further control of sediment from construction sites within Ventura County.

Although the transport of metals is not usually through direct actions of the public, public education of stormwater pollution prevention can provide assistance the efforts of the other programs and future efforts can be tailored to address sources of metals such as promoting household hazardous waste collection events to dispose of mercury containing compact fluorescent light bulbs. Other efforts include the Brake Pad Partnership and [Senate Bill \(SB\) 346](#), legislation that authorizes the phase out of copper from vehicle brake pads discussed above.

Beyond these efforts conducted under our municipal stormwater programs, certain metals (copper, nickel, selenium, and mercury) are being addressed under the various TMDL programs. These constituents have been identified as causing impairment in Calleguas Creek, its tributaries, and Mugu Lagoon. As a result a Metals Work Plan has been developed by the Calleguas Creek TMDL MOA Parties and is currently being implemented¹⁸. This multiple year plan provides the framework to (1) determine whether or not metals impairments still exist in the watershed, (2) develop site-specific objectives for copper and nickel, and (3) if necessary, identify the control measures needed to meet the TMDLs. It is expected that the control measures identified under this effort will inform the efforts to address aluminum and mercury in the Calleguas Creek and Santa Clara River watersheds.

Organics and Pesticides

Two organic compounds were detected at elevated levels during the 2011/12 season, bis(2-ethylhexyl)phthalate at MO-SPA during Event 2 and benzo(a)pyrene at MO-HUE during Event 3. Bis(2-ethylhexyl)phthalate WQS exceedances were not observed in receiving waters which indicates that bis(2-ethylhexyl)phthalate concentrations in urban runoff did not affect beneficial uses in the receiving water. Bis(2-ethylhexyl)phthalate is ubiquitous in plastics and is therefore a common sampling and laboratory contaminant, however, the 2011/12 pre-season equipment blanks analyzed by the Program and the method blank analyzed by the laboratory for this batch were both below the method detection limit for bis (2-ethylhexyl) phthalate. Benzo(a)pyrene is a polycyclic aromatic hydrocarbon (PAH) that is produced by incomplete combustion and is found in fossil fuels. It is not commercially produced or used. PAHs are primarily released to the air and then are deposited onto land/water. Benzo(a)pyrene is also found in coal-tar based pavement sealcoat, however this type of seal coat is not commonly used on the west coast. The benzo(a)pyrene may have been deposited from a residential fire which occurred less than one mile upstream of the monitoring station. The fire was on February 6 and no significant rain fell after the fire until Event 3 on March 17. Outfall from beach fires is also a likely source, and will be investigated if the elevated levels continue to be detected. Each compound was only detected once during the 2011/12 season so they are not

¹⁸ <http://www.calleguascreek.org/ccwmp/4d.asp> November 3, 2011.

considered persistent. Neither compound was detected above the WQS in the receiving waters so they are not considered to cause or contribute to exceedances of WQS.

Pentachlorophenol was the only pesticide detected above WQS criteria, which include a Basin Plan objective of 1 µg/L (wet and dry weather) and a pH-based CTR criterion (dry weather). This occurred at one Major Outfall (MO-MPK, Event 1) during the 2011/12 season. No Pentachlorophenol exceedances were observed in receiving waters. The lack of exceedances for this pollutant at the receiving water station indicates that Pentachlorophenol concentrations in wet weather urban runoff did not affect downstream receiving water beneficial uses with regard to this chlorinated hydrocarbon. In 2011, the Watershed Protection District and the City of Moorpark worked in a joint effort to identify the source of Pentachlorophenol. A special inspection was performed on the SoCal Edison Transfer Station along with special monitoring of the runoff. SoCal Edison responded by increasing BMPs on the site and changing some of their material handling procedures. The Program continued to monitor the area for pentachlorophenol when runoff was present during monitoring events for the 2011/12 season. In addition to the original Edison outfall site (Edison RC pipe at MPK – Lower), the Program monitored a second outfall from the property (Edison RC pipe at MPK – Upper), and a location upstream of MO-MPK and both Edison outfalls (MO-MPK Upstream at RR). The results are shown in Table 9-23. Subsequent sampling events have shown mixed results for the effectiveness of the BMPs. Additional efforts, and follow up and enforcement are the responsibility of the Edison, the City and the Regional Board through their industrial stormwater permit program.

Table 9-23: Pentachlorophenol Results at MO-MPK

Constituent	SiteID	EventID	Sign	Result	Units
Pentachlorophenol	MO-MPK	2010/11-1	=	13	µg/L
Pentachlorophenol	MO-MPK	2010/11-2	=	4.6	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Lower	2010/11-4	=	17	µg/L
Pentachlorophenol	MO-MPK	2010/11-4	=	2.3	µg/L
Pentachlorophenol	MO-MPK	2010/11-5 (Dry)	<	0.04	µg/L
Pentachlorophenol	MO-MPK Upstream at RR	2011/12-1	DNQ	0.17	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Upper	2011/12-1	=	0.58	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Lower	2011/12-1	=	4.8	µg/L
Pentachlorophenol	MO-MPK	2011/12-1	=	1.2	µg/L
Pentachlorophenol	MO-MPK Upstream at RR	2011/12-2	DNQ	0.061	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Upper	2011/12-2	=	5.8	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Lower	2011/12-2	=	3.1	µg/L
Pentachlorophenol	MO-MPK	2011/12-2	=	4.6	µg/L
Pentachlorophenol	MO-MPK Upstream at RR	2011/12-3		NS ¹	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Upper	2011/12-3		NS ¹	µg/L
Pentachlorophenol	Edison RC pipe at MPK - Lower	2011/12-3		NS ¹	µg/L
Pentachlorophenol	MO-MPK	2011/12-3	=	0.95	µg/L
Pentachlorophenol	MO-MPK	2011/12-4 (Dry)		No Flow	µg/L

¹ Samples could not be collected from Edison outfalls because no flow at time of grab sampling.

Table 9-24 Organics and Pesticides detected above Basin Plan and/or CTR Objectives

Organics and Pesticides detected above Basin Plan Objective				
Site	Event 1 (Wet)	Event 2 (Wet)	Event 3 (Wet)	Event 4 (Dry)
Calleguas Creek Watershed				
Outfalls not causing or contributing to exceedance				
ME-CC				
MO-CAM				
MO-MPK	Pentachlorophenol			Dry
MO-SIM				
MO-THO				
Santa Clara River Watershed				
Outfalls not causing or contributing to exceedance				
ME-SCR				
MO-FIL				
MO-OXN				
MO-SPA		Bis(2-ethylhexyl)phthalate		Dry
MO-VEN				
Ventura River Watershed				
Outfalls not causing or contributing to exceedance				
ME-VR2				
MO-OJA				
MO-MEI				
Coastal Watershed				
Unknown if outfall causing or contributing to exceedance				
MO-HUE			Benzo(a)pyrene	
Dry – Not sampled during this event due to insufficient flow at site				

Salts

Concentrations observed above WQS for salts in the three watersheds monitored by the Program were limited to dry weather Event 4 (with the exception of MO-OJA in wet Event 2) that showed elevated levels of chloride and total dissolved solids. This is in accordance with historical data from dry weather events, when flows are comprised of a larger groundwater component. Concentrations above the Basin Plan site-specific objectives of 60 mg/L for chloride and 800 mg/L for total dissolved solids (TDS) were seen at the MO-MEI and MO-OJA Major Outfalls during dry weather Event 4, however the Ventura River at the ME-VR2 receiving water station did not have an exceedance of its corresponding site-specific objectives of 300 mg/L for chloride and 1500 mg/L TDS. Chloride was detected above the site specific objective of 80 mg/L at the MO-FIL Major Outfall during Event 4; however it was not detected above the corresponding site specific objective for the receiving water, 80 mg/L at ME-SCR.

Because urban runoff elevated levels of salts did not co-occur with such elevated levels in receiving waters in the Ventura and Santa Clara River watersheds, the Program concludes that urban runoff monitored during both wet and dry discharge events did not affect receiving water beneficial uses with regard to salts in these watersheds during the 2011/12 season. Levels of TDS above the site specific objective of 850 mg/L were seen at the Major Outfalls MO-SIM and MO-THO during dry Event 4, however ME-CC, the receiving water station, was below the same SSO so the elevated levels at the Major Outfalls did not affect the beneficial use of the receiving water. Levels above the 150 mg/L chloride SSO were also detected during Event 4 at the same two Major Outfalls, MO-SIM and MO-THO, and at the receiving water station, ME-CC, so the urban runoff is likely to have contributed to the exceedance of the Basin Plan Objective for chloride in the receiving water during dry weather Event 4. The area of Simi Valley has a known high ground water problem with natural springs, seeps and artesian conditions in the western part of the County. In addition, there is a Salt TMDL that is evaluating monitoring and implementing solutions throughout the watershed. More information on this is provided below.

The Program is unable to evaluate if concentrations above salts objectives within the watershed are a persistent issue during any given monitoring season because the Program is limited to a single wet season-dry weather monitoring event. Additionally, the other dry weather event, the dry season-dry weather monitoring event, required to be conducted by the Program represents grab sampling (as opposed to composite sampling) and does not include a requirement to evaluate chloride and TDS. The Program can only state that historic monitoring data collected during dry weather sampling events show regular elevated levels of chloride and total dissolved solids objectives in the Calleguas Creek Watershed.

Table 9-25 Salts detected above Basin Plan Site-specific Objectives

Salts detected above Basin Plan Objective				
Site	Event 1 (Wet)	Event 2 (Wet)	Event 3 (Wet)	Event 4 (Dry)
Calleguas Creek Watershed				
Outfalls not causing or contributing to exceedance – Events 1-3				
ME-CC				Chloride only
MO-CAM				
MO-MPK				Dry
MO-SIM				X
MO-THO				X
Santa Clara River Watershed				
Outfalls not causing or contributing to exceedance				
ME-SCR				
MO-FIL				Chloride only
MO-OXN				
MO-SPA				Dry
MO-VEN				
Ventura River Watershed				
Outfalls not causing or contributing to exceedance				
ME-VR2				
MO-OJA		Chloride only		X
MO-MEI				X
Dry – Not sampled during this event due to insufficient flow at site				
X – Chloride and Total Dissolved Solids				

Boron, chloride, sulfate, and total dissolved solids (“salts”) are currently being addressed in the Calleguas Creek Watershed through the implementation of the Calleguas Creek Salts Total Maximum Daily Load (TMDL), adopted by the Los Angeles Regional Water Quality Control Board in October 2007. The CCW Salts TMDL only applies during dry weather and applies to the receiving water, not at tributary outfalls. During the first three years of the TMDL implementation plan for the watershed, the primary implementation action is water conservation,

which all of the Permittees have done. The ultimate goal of the TMDL is to bring the watershed into “salt balance” where the inputs of salts are equal to or less than the amount of salts exported out of the watershed during dry weather. Water conservation on the part of municipalities reduces the input side of the equation. The salts loading calculation is performed on an annual basis and wet weather exports are not considered in the analysis. Beyond water conservation, the proposed implementation plan does not include many options for MS4 dischargers. Most of the planned actions are construction of groundwater desalters and wastewater treatment plants reverse osmosis as these are considered to be the major source of the salts. Municipal stormwater actions to control salts are limited due to the fact that most salts in runoff come from source water supplies. The primary course of action for municipalities is to reduce outdoor water use, thereby limiting the amount of runoff that may contain high salts from entering urban tributaries and receiving waters. Permittees have also taken steps to the prohibition of discharges from Salt Water pools. Camarillo has conducted outreach to pool service companies and provided articles in their local newsletter to residents alerting them that they cannot discharge salt water pools to the storm drain system. The City of Thousand Oaks and Simi Valley also banned the discharge of salt water pools to the storm drain system. Self regenerating water softeners are a source of salts in the watershed, though not commonly to the storm drain system. Permittees have prohibited their use at commercial and industrial facilities, while education is provided to discourage their use by residents. These are all efforts that should assist with reducing salts in the watershed.

Other Constituents

No other constituents were found to cause or contribute to exceedances of water quality objectives. Dissolved oxygen concentrations below the Basin Plan 5 mg/L objective were measured at the Major Outfalls MO-FIL (Events 3 and 4), MO-HUE (Events 2 and 3), and MO-SIM (Event 1), and at the Ventura River receiving water station, ME-VR2 (Event 2). Possible causes of low dissolved oxygen readings include standing water, oxygen demand by decaying organic matter or algae, and technical issues (e.g. insufficient flow across the meter membrane due to lack of flow or flow obstruction). MO-SIM was sampled early in the hydrograph, when flow may have been insufficient for an accurate reading. The low levels at MO-FIL and MO-HUE are not unexpected as the conditions at both locations create standing water where the water is not agitated or aerated to provide addition of oxygen as would be the case in a flowing storm drain or receiving water. At MO-FIL the monitoring station is at the transition of concrete channel to natural bottom channel and vegetation growth in the natural bottom portion of the outfall impedes the flow resulting in deep, slow moving water at the monitoring location. At MO-HUE the flow from the major outfall must be pumped out to the receiving water, the pumps are intermittent and the flow backs up until they are triggered. Dissolved oxygen measured at the outfall when the pumps are operating is above minimum WQS concentration. No exceedances of the Basin Plan objective for dissolved oxygen were observed at any of the corresponding receiving water stations during the 2011/12 season. Low dissolved oxygen was observed at ME-VR2 but not at either of the upstream outfalls, so the outfalls appear to not cause or contribute to the low dissolved oxygen. The lack of correlation between exceedances for dissolved oxygen at the outfalls and corresponding receiving water stations indicates that dissolved oxygen concentrations in urban runoff did not significantly affect receiving water quality with regard to this parameter. The Program also measured pH levels outside of the Basin Plan’s 6.5 – 8.5 standard unit range during dry weather at the MO-CAM (Event 4), MO-MEI (Event 4), MO-OXN (Event 4), and MO-VEN (Event 4) Major Outfall stations. Elevated pH is commonly observed during dry weather in concrete lined channels. No exceedances of the Basin Plan pH range objective were observed at any of the receiving water stations during the 2011/12 season. The lack of exceedances for pH at the receiving water stations indicates that pH levels in urban runoff did not affect receiving water beneficial uses with regard to this parameter.

Table 9-26 Other constituents detected above Basin Plan Objective

Other constituents detected above Basin Plan Objective				
Site	Event 1 (Wet)	Event 2 (Wet)	Event 3 (Wet)	Event 4 (Dry)
Calleguas Creek Watershed Outfalls not causing or contributing to exceedance				
ME-CC				
MO-CAM				pH
MO-MPK				Dry
MO-SIM	DO			
MO-THO				
Santa Clara River Watershed Outfalls not causing or contributing to exceedance				
ME-SCR				
MO-FIL			DO	DO
MO-OXN				pH
MO-SPA				Dry
MO-VEN				pH
Ventura River Watershed Outfalls not causing or contributing to exceedance				
ME-VR2		DO		
MO-OJA				
MO-MEI			pH	
Coastal Watershed Unknown if outfall causing or contributing to exceedance				
MO-HUE		DO	DO	

Dry – Not sampled during this event due to insufficient flow at site
DO – Dissolved oxygen

Mass Emission Calculations

Mass loadings were estimated for constituents detected at the ME-CC and ME-VR2 Mass Emission stations during the 2011/12 monitoring season. Mass loadings could not be calculated at the ME-SCR station because total flow could not be accurately measured, as described in Section 9.3.1.

Mass loads were calculated by using the average flow total flow volume between first and last aliquot collection in cubic feet divided by the time elapsed between the first and last aliquots in seconds] measured in cubic feet per second, (cfs) estimated over the duration of a monitoring event and the concentrations of detected constituents. For grabs, this is the concentration measured in the grab sample. For composites, this is the concentration measured in the composite bottle, which is a combination of aliquots collected during the event. Event duration was defined as the number of hours elapsed between the collection of the first and the final aliquots by the composite sampler at each site. Storm events monitored during 2011/12 at the ME-CC and ME-VR2 stations lasted from just over 8 hours (Event 2 at ME-VR2) to just over 25 hours (Event 1 at ME-VR2). Based on the average flow rate for a sampling event, loadings were calculated in lbs/event to allow for comparisons between sites as well as between events (see example in Table 9-27). These mass loading estimates are presented in Table 9-28 and Table 9-29.

Table 9-27. Example Mass Loading Calculation

Event 1 at ME-CC
Chloride concentration: 100 mg/L Event duration: 12 hours, 46 minutes = 12.77 hours
Average flow rate: 216.03 cfs $216.03 \times 7.48 \text{ gal/cf} \times 3.785 \text{ L/gal} = 6116.2 \text{ L/sec}$
Load = concentration x volume $6116.2 \text{ L/sec} \times 100 \text{ mg/L} = 611620 \text{ mg/sec}$ $611620 \text{ mg/sec} \times 60 \text{ sec/min} \times 60 \text{ min/hr} \times 12.77 \text{ hr/event} \times 1 \text{ kg}/10^6 \text{ mg} \times 2.2 \text{ lb/kg} = \mathbf{61,858 \text{ lb/event}}$

Table 9-28. Estimated Mass Loadings at ME-CC

Classification	Constituent	Event 1 (Wet) 10/05/2011 12.77 hrs. (lbs/event)	Event 2 (Wet) 1/21/2012 12.78 hrs. (lbs/event)	Event 3 (Wet) 3/17/2012 21.25 hrs. (lbs/event)	Event 4 (Dry) 5/23/2012 23.22 hrs. (lbs/event)
Anion	Chloride	61800	34000	167000	19200
Anion	Fluoride	192	137	926	56.7
Cation	Calcium	40800	28400	157000	8700
Cation	Magnesium	26000	14700	80300	4550
Conventional	BOD	6120	2390	34000	172*
Conventional	COD	105000	27400	253000	1420
Conventional	MBAS	16.7*	23.9*	ND	3.6*
Conventional	Phenolics	41.4	7.1	216	4.5
Conventional	Total Chlorine Residual	12.4*	76.2*	98.8*	5.0*
Conventional	Total Dissolved Solids	495000	208000	895000	74900
Conventional	Total Organic Carbon	10500	3710	26500	516
Conventional	Total Suspended Solids	49500	330000	3700000	2830
Conventional	Volatile Suspended Solids	8040	43200	895000	810
Conventional	Oil and Grease	ND	660*	ND	ND
Metal	Aluminum (Total)	4880	4570	40100	42.5
Metal	Antimony (Total)	0.50	0.23*	1.9	0.038*
Metal	Arsenic (Total)	3.8	3.7	20.4	0.37
Metal	Barium (Total)	68.0	71.1	556	3.4
Metal	Beryllium (Total)	0.23	0.27	2.2	ND
Metal	Cadmium (Total)	0.68	0.66	5.9	0.022
Metal	Chromium (Total)	16.1	11.7	117	0.19
Metal	Chromium VI	0.050*	0.081*	0.37*	0.009*
Metal	Copper (Total)	18.5	13.7	127	0.45
Metal	Iron (Total)	8660	8120	64800	62.7
Metal	Lead (Total)	6.1	6.6	46.3	0.036
Metal	Mercury (Total)	0.028*	0.019*	0.23	0.002*
Metal	Nickel (Total)	19.2	14.2	136	0.85
Metal	Selenium (Total)	1.4	0.56	4.9	0.14
Metal	Silver (Total)	0.11*	ND	0.77	ND
Metal	Thallium (Total)	0.093*	0.10	0.83	ND

Classification	Constituent	Event 1 (Wet) 10/05/2011 12.77 hrs. (lbs/event)	Event 2 (Wet) 1/21/2012 12.78 hrs. (lbs/event)	Event 3 (Wet) 3/17/2012 21.25 hrs. (lbs/event)	Event 4 (Dry) 5/23/2012 23.22 hrs. (lbs/event)
Metal	Zinc (Total)	56.3	47.2	401	2.1
Nutrient	Ammonia as N	396	208	1050	16.2
Nutrient	Nitrate + Nitrite as N	2290	1930	7100	789
Nutrient	Nitrate as N	2290	1880	7100	769
Nutrient	Phosphorus as P (Total)	2470	1470	8640	304
Nutrient	TKN	4580	371	2070	25.3
Organic	Bis(2-ethylhexyl)adipate	ND	ND	0.96*	ND
Organic	Butyl benzyl phthalate	0.12*	ND	ND	ND
Organic	Diethyl phthalate	0.32*	0.20*	21.0	0.28
Organic	Dimethyl phthalate	ND	ND	2.2*	ND
Pesticide	4,4'-DDE	0.006*	0.013*	ND	ND
Pesticide	4,4'-DDT	0.004*	ND	ND	ND
Pesticide	Chlorpyrifos	ND	0.13	0.077	ND
Pesticide	DCPA (Dacthal)	0.74	0.76	1.5	0.17
Pesticide	Diazinon	0.003*	0.004*	ND	ND
Pesticide	Dimethoate	ND	ND	0.090	ND
Pesticide	Glyphosate	11.1	2.4*	23.5	0.18*
Pesticide	Malathion	0.037	3.7	0.12	ND
Pesticide	Methyl parathion	ND	ND	0.083	ND
Pesticide	Prometryn	ND	ND	ND	0.021

ND – Constituent not detected, and, therefore, no estimated mass loading was calculated.
* - Calculation of mass loading derived from result flagged as DNQ - constituent detected but not quantified (MDL < result < RL).

Table 9-29. Estimated Mass Loadings at ME-VR2

Classification	Constituent	Event 1 (Wet) 10/05/2011 25.17 hrs. (lbs/event)	Event 2 (Wet) 1/21/2012 8.23 hrs. (lbs/event)	Event 3 (Wet) 3/17/2012 24.43 hrs. (lbs/event)	Event 4 (Dry) 4/23/2012 23.47 hrs. (lbs/event)
Anion	Chloride	11700	1250	12400	5590
Anion	Fluoride	78.5	5.1	102	41.9
Cation	Calcium	21900	1360	23800	9610
Cation	Magnesium	6570	430	6670	2970
Conventional	BOD	365	32.9	762	245
Conventional	COD	3470	181	5480	1220
Conventional	MBAS	6.6*	0.57	8.1*	ND
Conventional	Phenolics	11.0	0.89	6.4	4.0
Conventional	Total Dissolved Solids	135000	8950	119000	57700
Conventional	Total Organic Carbon	1000	60.0	1100	245
Conventional	Total Suspended Solids	2560	102	5240	699
Conventional	Volatile Suspended Solids	ND	45.3*	ND	437
Metal	Aluminum (Total)	38.3	0.76	61.9	3.8
Metal	Antimony (Total)	0.031*	0.001*	0.036*	0.008*
Metal	Arsenic (Total)	0.31	0.018	0.22	0.17

Classification	Constituent	Event 1 (Wet) 10/05/2011 25.17 hrs. (lbs/event)	Event 2 (Wet) 1/21/2012 8.23 hrs. (lbs/event)	Event 3 (Wet) 3/17/2012 24.43 hrs. (lbs/event)	Event 4 (Dry) 4/23/2012 23.47 hrs. (lbs/event)
Metal	Cadmium (Total)	0.024	0.0007*	0.024	0.004*
Metal	Chromium (Total)	0.12	0.002	0.15	0.012*
Metal	Chromium VI	ND	ND	0.007*	ND
Metal	Copper (Total)	0.33	0.015	0.57	0.04*
Metal	Iron (Total)	166	17.0	148	52.4
Metal	Lead (Total)	0.047	0.002*	0.095	0.007*
Metal	Mercury (Total)	0.005*	0.0001*	0.007*	0.001*
Metal	Nickel (Total)	0.95	0.057	1.0	0.24
Metal	Selenium (Total)	0.22	0.006	0.50	0.068
Metal	Silver (Total)	ND	ND	ND	0.007*
Metal	Thallium (Total)	ND	0.0002*	ND	0.003*
Metal	Zinc (Total)	0.64*	0.031*	1.3	0.16*
Nutrient	Ammonia as N	14.6*	ND	15.7*	ND
Nutrient	Nitrate + Nitrite as N	74.9	0.88*	105	1.4*
Nutrient	Phosphorus as P (Total)	27.4	1.5	23.8	4.2
Nutrient	TKN	104	7.5	105	14.0
Organic	Butyl benzyl phthalate	ND	ND	ND	0.065*
Organic	Diethyl phthalate	0.13*	0.007*	0.16*	0.073*
Pesticide	Dimethoate	ND	ND	0.005	ND
Pesticide	Methyl parathion	0.002	ND	0.013	ND

ND – Constituent not detected, and, therefore, no estimated mass loading was calculated.

* - Calculation of mass loading derived from result flagged as DNQ - constituent detected but not quantified (MDL < result < RL).

9.6 MASS EMISSION STATIONS CONCENTRATION TRENDS 2001 - 2012

9.6.1 Methods

Trend analysis was performed for Ventura County's three mass emission station, using data collected between February 2001 (ME-CC and ME-VR/VR2) or November 2001 (ME-SCR) and May 2012. The trend analysis was performed separately for wet and dry weather events, and data for ME-VR and ME-VR2 were pooled to be consistent with the other stations, and to obtain sufficient data for trend analysis.

Concentration trends in time were determined by correlating the variables concentration and sampling date. Non-parametric statistical methods were used, based on the recommendations of Helsel and Hirsh (2002)¹⁹, and therefore tests for normality or data transformations were not required. Trend analyses were performed for all constituents with more than 10% of the data above the limit of detection. Statistical procedures were based on

¹⁹ Helsel, D.R. and R. M. Hirsch, 2002. Statistical Methods in Water Resources. Techniques of Water Resources Investigations, Book 4, chapter A3. U.S. Geological Survey, 522 p.

Helsel and Hirsh (2002)¹⁹ and Helsel (2012)²⁰, and varied based on the occurrence of observations qualified as non-detectable (NDs) and detectable but not quantifiable (DNQ), as summarized in Table 9-30. The statistical procedures used were able to incorporate variable detection and reporting limits. Trends were considered to be statistically significant at $p < 0.05$. Note that the non-parametric statistics do not assume or require linear trends.

Table 9-30. Statistical procedures and software for trend analysis

Constituent concentrations	Statistic	Software
Always above reporting limit	Kendall Tau	Analyze-it for Microsoft Excel
< 90% of observations below detection limit, one detection limit, no DNQs	Kendall Tau	Analyze-it for Microsoft Excel
< 90% of observations below detection limit, multiple detection limits, no DNQs	Kendall Tau	R (package “NADA”)
< 90% of observations below reporting limit, DNQs and NDs occur	Wilcoxon score	R (package “interval”)

Whenever significant trends were found, we also determined if the trends were caused by one of the following explanatory variables: flow (instantaneous for grabs, mean event flow for composites), total suspended solids or antecedent dry period (time since last wet event with at least 0.1” of precipitation). Statistical procedures were based on Helsel and Hirsch (2002)¹⁹ and consisted of (i) determining correlation (using Kendall Tau) between concentration and explanatory variables, (ii) if a significant correlation was observed, a non-parametric Loess trendline of concentration vs. explanatory variable was constructed, (iii) the “corrected” concentration was calculated by subtracting the trendline value from the concentration value, and (iv) the trend analysis was repeated for the “corrected” concentrations versus time. The final “corrected” trends are a better representation of actual trends, and indicate if constituent concentrations *for a given flow*, or *for a given concentration of TSS*, have changed in time. Conversely, trends that are actually caused by patterns of flow, TSS or antecedent dry period would not be identified as significant trends.

Temporal **trends of water quality exceedances** were also determined. The total number of exceedances were summed and divided by the number of events for each monitoring year, for wet and dry events separately, in order to obtain an average number of exceedances per wet and dry event. For dry events, trends were determined between 2001 and 2012. For wet events, data prior to 2004 were not included, because some of the constituents that sometimes cause exceedances were not analyzed at the time. Statistical significance of trends was determined by correlating average annual number of exceedances with time (year) using Kendall Tau. All exceedances were determined by comparing to Basin Plan and CTR numerical water quality criteria, as detailed in Section 9.5.1.

9.6.2 Concentration Trends

Detailed information for all significant trends, including appropriate statistic (Kendall Tau or Wilcoxon score) and statistical significance, is shown in Table 9-31. Note that trends were not corrected for explanatory variables flow, TSS or antecedent dry period in Table 9-31. A summary of increasing and decreasing trends, including revised trends after adjusting for explanatory variables, is provided in Figure 9-9. The most significant findings are discussed below, with some graphs to illustrate trends.

²⁰ Helsel, D.R., 2012, Statistics for censored environmental data using Minitab® and R, 2nd ed., John Wiley & Sons, Inc., Hoboken, NJ, 324 p.

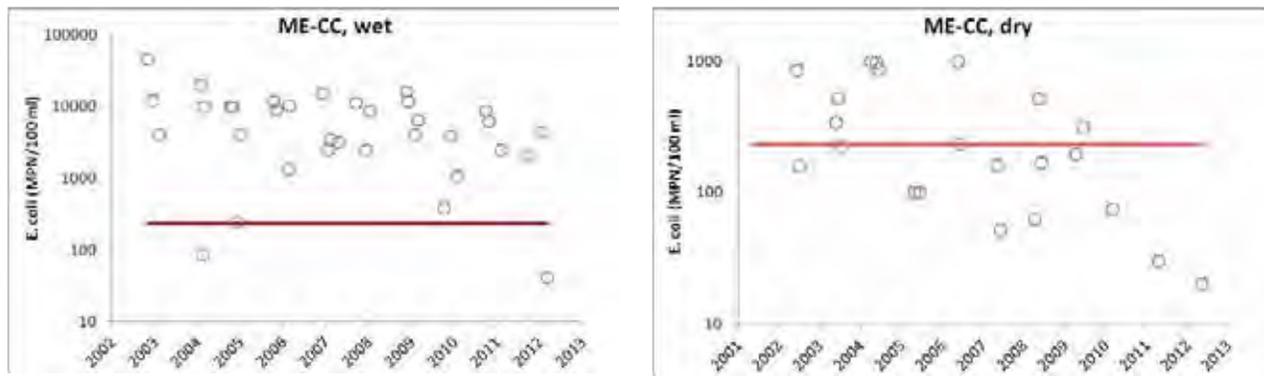
Figure 9-9. Summary of significantly increasing and decreasing trends at Mass Emission Stations. Decreasing trends are indicated by downward green arrows, increasing trends by upward red arrows. For metals, total fractions are indicated by colored arrows, dissolved fractions by open arrows. Grey arrows indicate where a significant trend was initially found, but where correction for TSS (1), flow (2) or antecedent dry period (3) yielded non-significant trends.

	DRY			WET		
	ME-CC	ME-SCR	ME-VR	ME-CC	ME-SCR	ME-VR
Coliforms, total		↓				
Coliforms, fecal		↓				
<i>E. coli</i>	↓			↓	↓	
<i>Enterococcus</i>	↓ 1			↓ 2		
BOD	↓ 1					
TKN	↓	↓	↓	↓ 1		↓
Phosphorus, dissolved	↑					
TDS		↓				
Chloride						↓ 2
Conductivity	↓ 3	↓				
Ca, Mg	↓ 3					
Hardness		↓	↓			↑
Diethyl phtalate	↑					
Diazinon	↓			↓		
Malathion				↑		
Arsenic	↑			↓	↓	
Antimony				↓		
Cadmium				↓ 1		↓ ↓
Chromium	↓ ↓	↓	↓ ↓	↓	↓	↓ ↓
Copper	↓ ↓ 1	↓ ↓	↓ ↓		↓	↓ ↓
Mercury				↓ 1		
Nickel	3 ↓ ↓	↓ ↓	↓ ↓	↓		↓ 1
Lead	↓		↓	↓		↓ ↓
Selenium	↓	↓		↓ ↓	↓ ↓	↓ ↓
Silver				↓		
Thallium				↓		
Zinc	↓ ↓	↓	↓ ↓	2 ↓ ↓		↓ ↓

Indicator bacteria

Dry and wet weather *E. coli* concentrations have significantly decreased at ME-CC since 2001. While wet weather concentrations remain high and usually exceed the basin plan objective of 235 MPN/100 ml, dry weather compliance has increased in recent years (Figure 9-10). Decreasing *Enterococcus* trends were observed as well at ME-CC, but these trends disappeared when accounting for flow and TSS concentration patterns. Concentration decreases for **total and fecal coliforms** (dry weather) and *E. coli* (wet weather) were observed at ME-SCR as well.

Figure 9-10. *E. coli* concentrations at ME-CC. Red lines indicate Water Quality Standards.

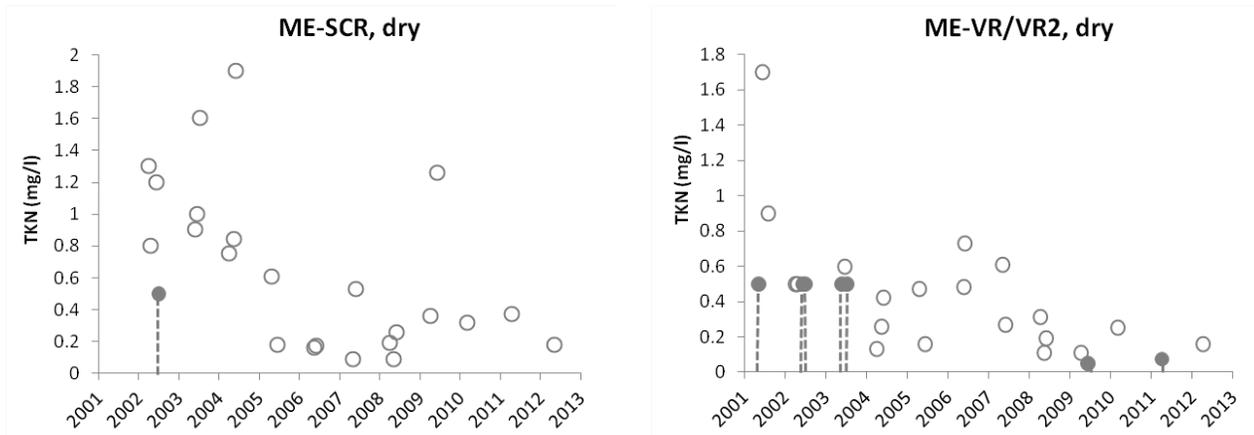


Nutrients

Dry weather **TKN** concentrations decreased at all stations (Figure 9-11), and wet weather TKN concentrations at ME-VR/VR2 only. The initially observed decreasing trend of wet weather TKN concentrations at ME-CC disappeared when accounting for flow patterns.

Dry weather **dissolved phosphorus** concentrations increased at ME-CC, but the increase was small, concentrations remain low (< 3 mg/l) and are not exceeding any water quality objective or TMDL limit.

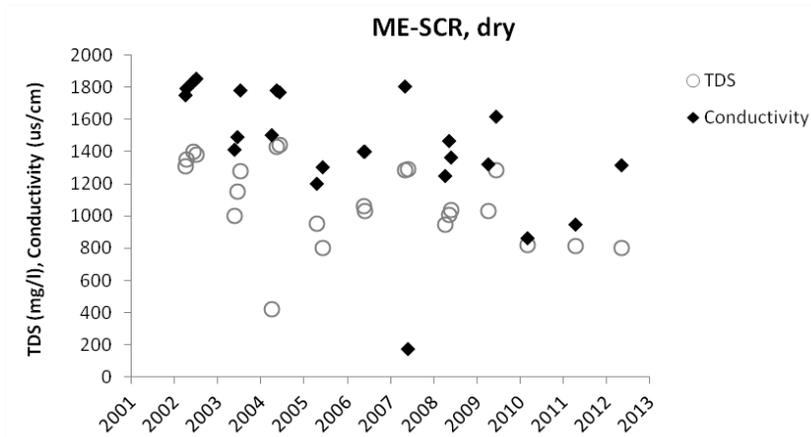
Figure 9-11. Total Kjeldahl Nitrogen (TKN) concentrations at ME-SCR and ME-VR/VR2. Concentrations below the detection limit are indicated by full grey symbols at detection limit value, connected by dotted line to zero.



Salts

Dry weather **TDS, conductivity and hardness** all decreased at ME-SCR (Figure 9-12). In addition, hardness trends at ME-VR/VR2 showed a decrease during for dry weather, but increase for wet weather.

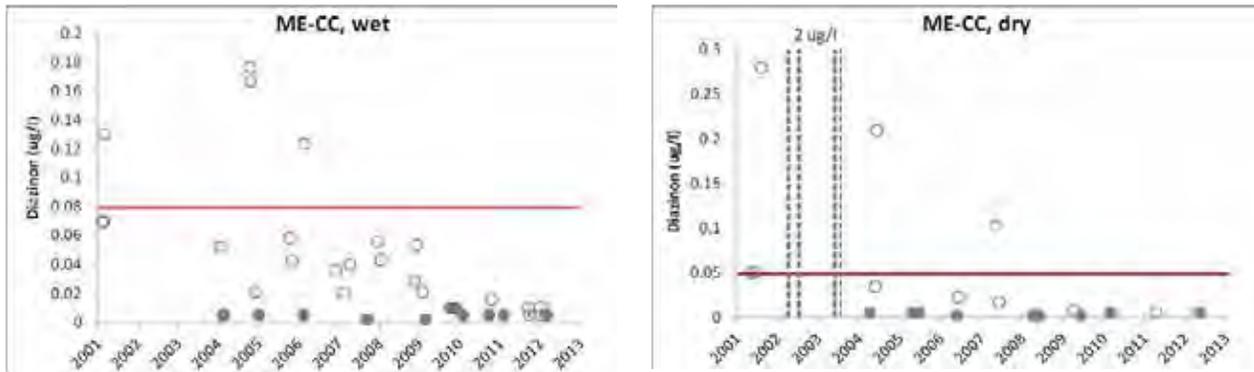
Figure 9-12. Dry weather concentrations of total dissolved solids (TDS) and conductivity at ME-SCR.



Organic compounds

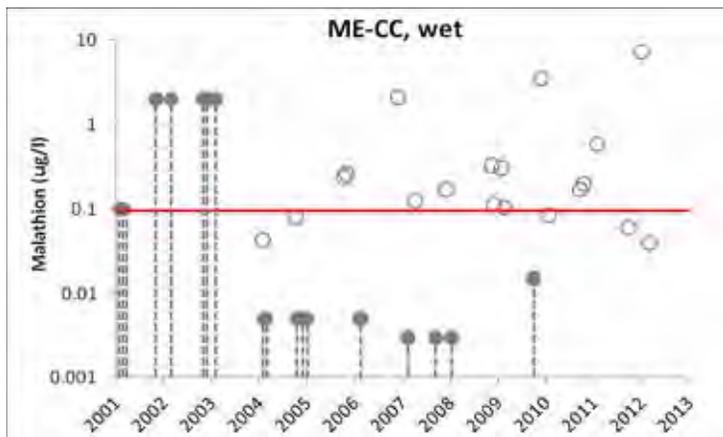
Dry and wet weather concentrations of the pesticide **diazinon** have decreased at ME-CC, to the point that exceedances of the Department of Fish and Game aquatic life criteria have not been observed since 2006 for wet weather and since 2007 for dry weather (Figure 9-13). The U.S. EPA phased out residential uses of diazinon, with a sales ban in the U.S. as of December 31, 2004, which appears to have effectively decreased concentrations at ME-CC. Remaining detections are likely due to the continued use by agriculture and commercial residential uses.

Figure 9-13. Diazinon trends at ME-CC. California Department of Fish and Game recommended criteria are shown by a red line (continuous concentrations for dry weather and maximum concentrations for wet weather). Concentrations below the detection limit are indicated by full grey symbols at detection limit value.



Wet weather concentrations of the pesticide **malathion** have increased at ME-CC, and regularly exceed the U.S. EPA national recommended water quality criterion of 0.1 $\mu\text{g/l}$ (Figure 9-14). Concentrations up to 7.2 $\mu\text{g/l}$ were observed (note the use of log-scale in Figure 9-14), which is at least tenfold higher than maximum concentrations at ME-SCR and ME-VR/VR2. However, current concentrations at ME-CC are 10- to 100-fold lower than concentrations observed in surface waters during the 1994-1995 Mediterranean Fruit Fly Eradication Program.²¹

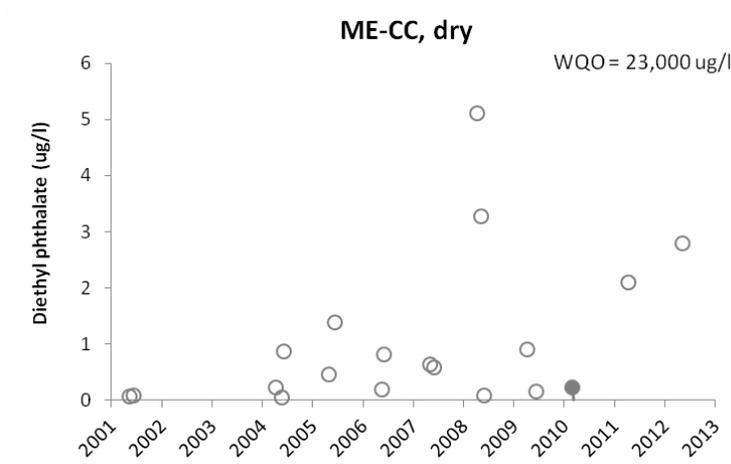
Figure 9-14. Wet weather malathion concentrations at ME-CC. U.S. EPA national recommended water quality criterion is shown by a red line. Concentrations below the detection limit are indicated by full grey symbols at detection limit value, connected by dotted line to zero.



²¹ Newhart, K., 2006. Environmental fate of malathion. California Environmental Protection Agency, Department of Pesticide Regulation.

An increase in dry weather **diethyl phthalate** concentrations was observed at ME-CC (Figure 9-15). As maximum observed concentrations were well below the water quality objective of 23,000 µg/l, the slight concentration increases are of no concern at this point.

Figure 9-15. Diethyl phthalate concentrations at ME-CC for dry weather. Concentrations below the detection limit are indicated by full grey symbols at detection limit value, connected by dotted line to zero.



Metals

Concentrations of many metals have decreased since 2001 at all mass emission stations. Decreasing trends in dry and wet weather dissolved concentrations, and to a lesser degree total concentrations, were commonly observed for **chromium, copper** (Figure 9-16), **selenium and zinc**.

Decreasing dry weather concentrations were also observed for **nickel** at ME-SCR and ME-VR/VR2, and for total **lead** at ME-CC and ME-VR/VR2. **Arsenic** concentrations have increased at ME-CC, but increases are small, and the maximum observed concentration of 4.5 µg/l is still well below the water quality objective of 50 µg/l.

Decreasing wet weather concentrations were observed at ME-CC for total **arsenic, antimony, silver and thallium**; and at ME-VR/VR2 for total and dissolved **cadmium and lead** (Figure 9-17).

Figure 9-16. Wet and dry weather dissolved copper concentrations at ME-SCR and ME-VR/VR2. Concentrations below the detection limit are indicated by full grey symbols at detection limit value.

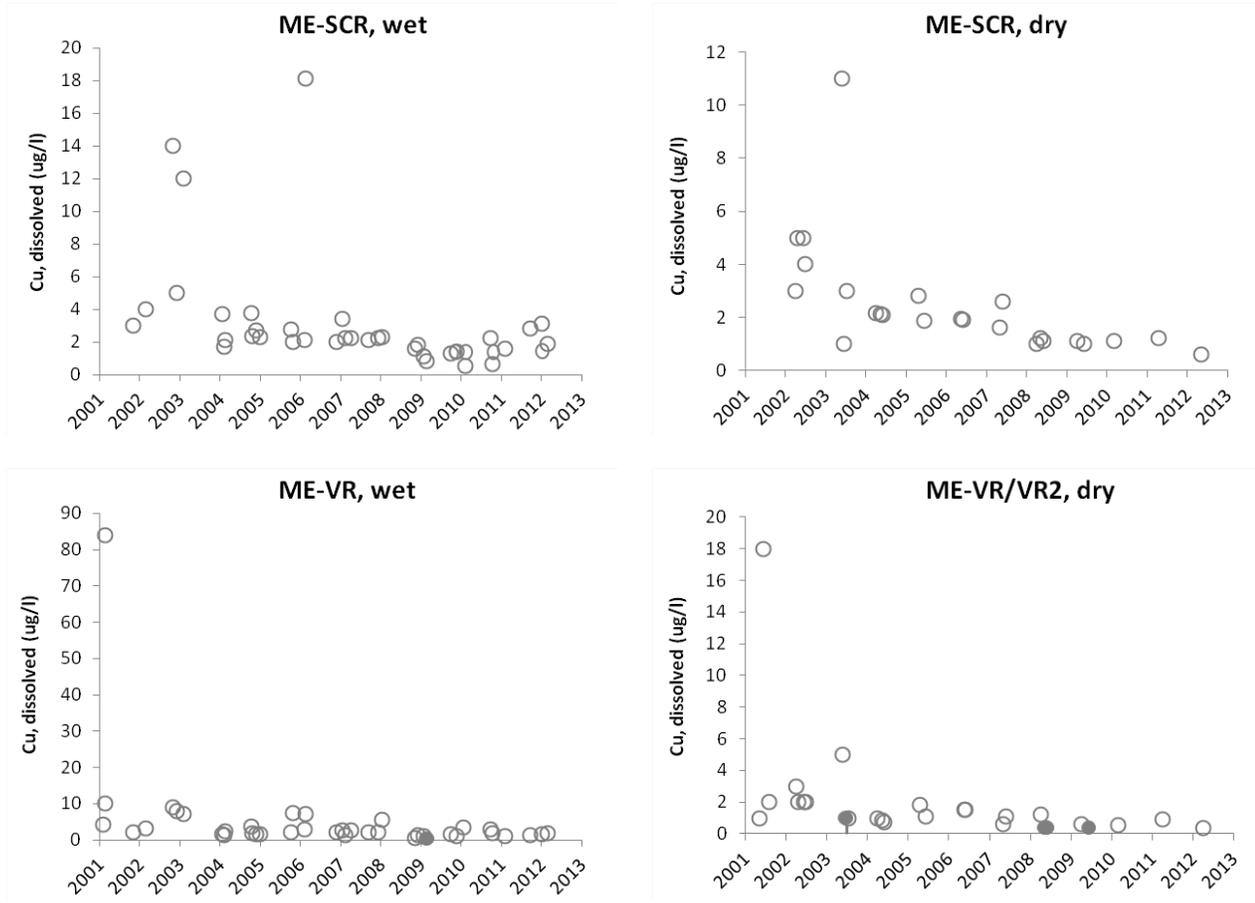
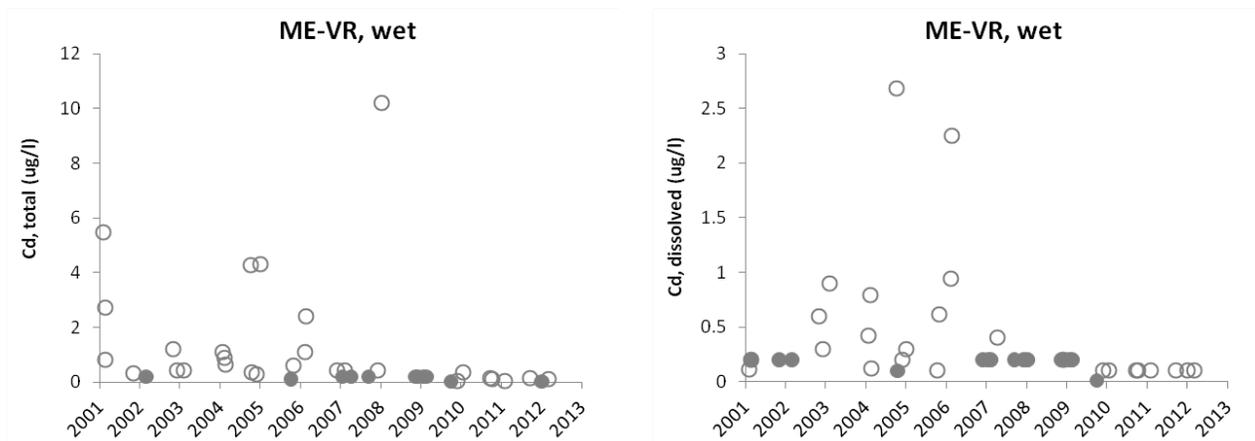
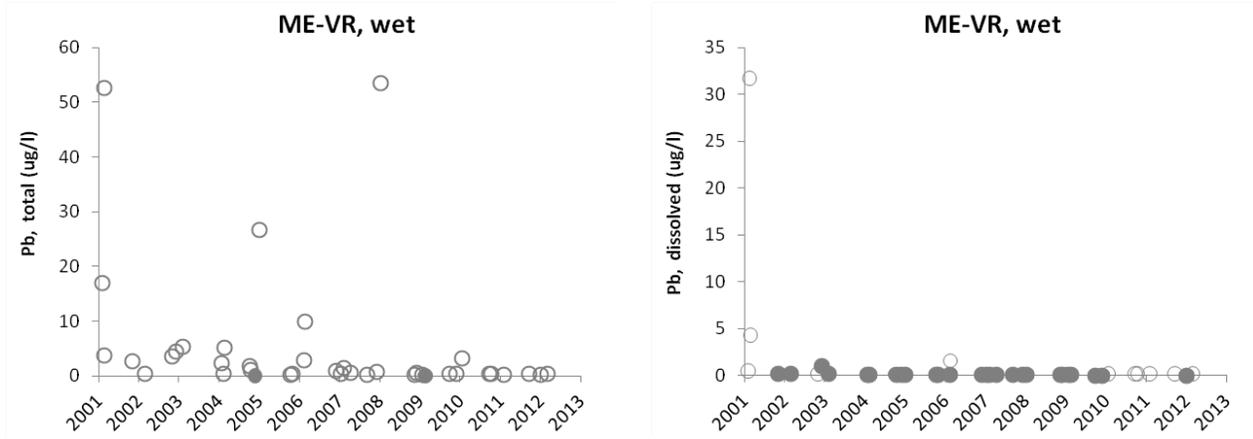


Figure 9-17. Wet weather total and dissolved lead and cadmium concentrations at ME-VR/VR2. Concentrations below the detection limit are indicated by full grey symbols at detection limit value.



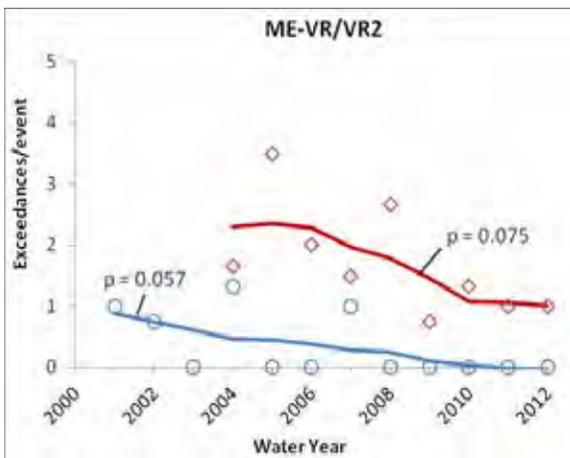
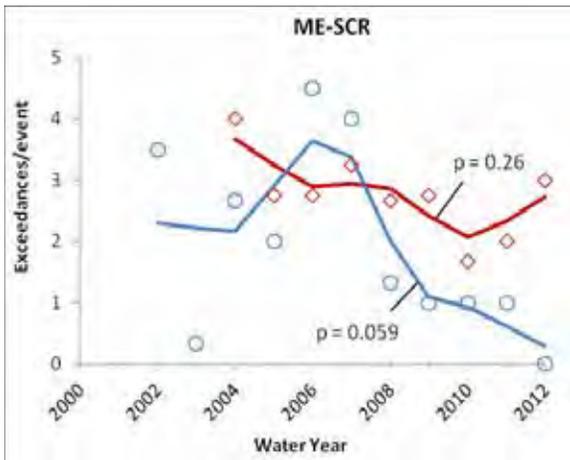
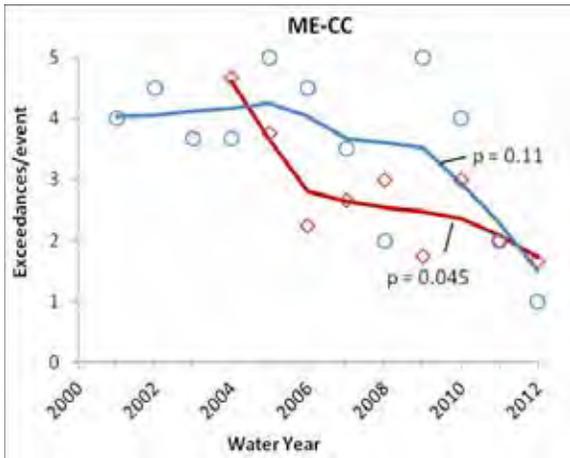


Trends in Water Quality Exceedances

The number of wet weather exceedances has decreased since 2004 at ME-CC and ME-VR/VR2, although the significance is rather low at the latter ($p = 0.075$) (Figure 9-18). A closer inspection of the data revealed that the above average number of exceedances in years 2004 and 2005 were mostly caused by a number of metals (total cadmium, chromium and nickel) for which concentrations correlate with TSS concentrations. Therefore, the decreasing trends are caused, at least partly, by the particularly high metal concentrations during the large storms observed in 2004 and 2005, and the decreasing trend is not expected to continue if high TSS concentrations are observed in the future.

The number of dry weather exceedances appears to have decreased at ME-SCR and ME-VR/VR2 since 2001, with statistical significances just above the threshold of 0.05. This conclusion is supported by the fact that the number of exceedances prior to 2004 is likely low biased, because a number of constituents that have caused dry weather exceedances were not being monitored yet (total aluminum), or had exceptionally high detection limits, resulting in nondetects only (benzo(a)pyrene, chrysene, bis(2-ethylhexyl)phthalate, 4,4'-DDD, 4,4'-DDE and toxaphene). The decrease in exceedances observed at ME-CC is not significant and was caused by the below average number of exceedances during the last two years. Therefore, more dry weather monitoring is needed to confirm if dry weather exceedances at ME-CC are decreasing.

Figure 9-18. Average annual number of exceedances per event for wet (red symbols and lines) and dry (blue symbols and lines) weather sampling. Lines represent Loess curves, obtained by local regression modeling. Kendall Tau statistical significances are included for each set of data.



Conclusions

Most of the 217 constituents currently monitored at the Mass Emission stations by the County have been monitored since 2001. Twenty-six of these 217 constituents, including metals, bacteria, nutrients, salts and one pesticide, have shown decreased concentrations at one or more stations. Only five constituents exhibited increasing trends, each time at only one of the stations, although none of these constituents were causing water quality exceedances based on Basin Plan and CTR numeric water quality criteria. However, malathion concentrations did regularly exceed the U.S. EPA national recommended water quality criterion.

The average number of dry weather exceedances has decreased since 2001 at ME-SCR and ME-VR/VR2. The number of wet event exceedances has decreased since 2004 at ME-CC and ME-VR/VR2, and could be related to the smaller storm sizes and therefore fewer exceedances for metals in recent years.

Table 9-31. Significant trends at mass emission stations. Test statistic is Kendall Tau correlation, unless indicated by asterisk, where test statistic is Wilcoxon score. Decreasing trends are indicated by negative Kendall Tau but positive Wilcoxon score statistics, and vice versa.

	DRY						WET					
	ME-CC		ME-SCR		ME-VR/VR2		ME-CC		ME-SCR		ME-VR/VR2	
	Statistic	P	Statistic	P	Statistic	P	Statistic	P	Statistic	P	Statistic	P
Coliforms, total			-0.38	0.011								
Coliforms, fecal			-0.34	0.04								
<i>E. coli</i>	-0.39	0.012					-0.28	0.022	-0.27	0.027		
<i>Enterococcus</i>	-0.40	0.010					-0.26	0.033				
BOD	9313*	0.0074										
TKN	-0.41	0.0026	-0.33	0.025	-0.34	0.011	-0.24	0.033			-0.35	0.0018
P, d	0.29	0.037										
Chloride											0.26	0.025
Calcium	0.70	0.0047										
Magnesium	0.51	0.047										
Hardness			-0.43	0.0034	-0.29	0.033					0.37	0.001
TDS			-0.34	0.021							0.27	0.017
Conductivity	0.30	0.030	-0.45	0.0019								
Diethyl phthalate	-6656*	0.025										
Diazinon	6814*	0.016					11302*	0.004				
Malathion							0.27	0.016				
Ag, t							7227	0.028				
As, d									8033*	0.024		
As, t	0.64	<0.0001					-0.23	0.047				
Sb, t							-0.52	0.020				
Cd, d											11733*	0.0019
Cd, t							9781*	0.024			15925*	0.0002
Cr, d	13334*	0.0001	9655*	0.0007	12536*	<0.0001	18282*	<0.0001	11607*	0.0005	18275*	<0.0001
Cr, t	10587*	0.0022			11296*	0.0007					14876*	0.0006
Cu, d	-0.44	0.0016	-0.66	<0.0001	12409*	0.00037			131414*	<0.0001	15209*	0.0004
Cu, t	-0.43	0.0023	-0.44	0.0026	13505*	0.00012					-0.37	0.0008
Ni, d	-0.28	0.047	-0.43	0.0036	-0.40	0.0033	-0.33	0.004				
Ni, t			-0.31	0.035	-0.42	0.002					-0.23	0.037
Pb, d							9644*	0.011			8709*	0.007
Pb, t	11303*	0.0009			10504*	0.0016					14794*	0.0006
Se, d	-0.33	0.016	-0.39	0.0084			-0.29	0.011	-0.44	0.0002	-0.29	0.0088
Se, t							-0.46	0.0003	-0.46	<0.0001	-0.32	0.0039
Th, t							10594*	0.0052				
Zn, d	-0.41	0.0032	4780*	0.014	8946*	0.004	-0.28	0.019			17425*	<0.0001
Zn, t	-0.43	0.0015			11868*	0.00051					18426*	<0.0001
Hg, d	-8558*	0.014	-7257*	0.018	-10374*	0.0028					-13027*	0.0022
Hg, t	-7721*	0.026	-7666*	0.013	-9989*	0.0042	9693*	0.023				

9.6.3 Aquatic Toxicity Results

No samples exhibited significant toxicity during the 2011/12 monitoring season, which can be seen in the IC₅₀ column of Table 9-33 and Table 9-34, where no value is < 100% (i.e. the undiluted sample did not kill half the organisms in the test).

The Stormwater Monitoring Program’s NPDES permit specifies that chronic toxicity monitoring must be conducted on all Mass Emission and Major Outfall stations. The permit requires that for the first year a station is online for the permit cycle, chronic toxicity testing is to be conducted using three species during two storm events, the first of the season plus one other. For the remainder of the permit term, toxicity testing is to be conducted for the first storm of the season for each station using the most sensitive species determined during the initial year of sampling. For Mass Emission stations, the tests included three marine and estuarine species: topsmelt, giant kelp, and purple sea urchin. For the Major Outfall stations, the tests included three freshwater species: fathead minnow, water flea, and green algae.

The Permit requires that marine/estuarine species be used for the mass emission stations and for sites that discharge into marine receiving waters. Freshwater species must be used for sites that discharge into freshwater receiving waters. This means that marine species are required to be used in freshwaters, such as at the three mass emission stations, and freshwater species are required to be used at the major outfalls, including MO-HUE which is influenced by the Pacific Ocean via J Street Drain. Although flow from all sampling sites is ultimately discharged to the ocean, Mass Emission samples are freshwater with a very low salt concentration. The use of marine species for the Mass Emission sites requires the sample to be greatly manipulated by adding a large quantity of salt. Salt addition results in oxygen uptake and requires the sample to be vigorously aerated. The results from marine organisms for freshwater toxicity tests are less applicable to the existing conditions in the receiving water than freshwater organisms..

The most sensitive species was determined for seven stations (ME-CC, ME-SCR, ME-VR2, MO-CAM, MO-MEI, MO-OJA, and MO-VEN) during the 2009/10 monitoring year. The other seven stations (MO-FIL, MO-HUE, MO-MPK, MO-OXN, MO-SIM, MO-SPA, and MO-THO) were brought online for the 2010/11 monitoring year and the most sensitive species were determined from the results from that year. The most sensitive species for each site are shown in Table 9-32, and will be used for toxicity analysis during the first rainfall event of future years, as required by the NPDES permit.

Table 9-32: Most Sensitive Species Selected for Annual Toxicity Testing

Site	Most Sensitive Species
ME-CC	Topsmelt*
ME-SCR	Purple sea urchin
ME-VR2	Topsmelt*
MO-CAM	Fathead minnow
MO-OJA	Fathead minnow
MO-MEI	Fathead minnow
MO-VEN	Water flea
MO-FIL	Water flea
MO-HUE	Water flea
MO-MPK	Green alga
MO-OXN	Fathead minnow
MO-SIM	Water flea
MO-SPA	Fathead minnow
MO-THO	Water flea

Toxicity sampling was conducted at all fourteen stations during Event 1 (October 5, 2011) of the 2011/12 monitoring year, using the most sensitive species determined for each site. The results are summarized in Table 9-33 and Table 9-34.

Table 9-33. Chronic Toxicity Results from Mass Emission Stations

			Topsmelt (<i>Atherinops affinis</i>)							
			Survival				Biomass			
Site	Event	Event Date	NOEC (%)	Tuc	IC₂₅ (%)	IC₅₀ (%)	NOEC (%)	Tuc	IC₂₅ (%)	IC₅₀ (%)
ME-CC	Event (Wet) 1	10/5/2011	100.00	1.00	>100.00	>100.00	100.00	1.00	>100.00	>100.00
ME-VR2	Event (Wet) 1	10/5/2011	100.00	1.00	>100.00	>100.00	100.00	1.00	>100.00	>100.00

			Purple sea urchin (<i>Strongylocentrotus purpuratus</i>)			
			Fertilization			
Site	Event	Event Date	NOEC (%)	Tuc	IC₂₅ (%)	IC₅₀ (%)
ME-SCR	Event (Wet) 1	10/5/2011	50.0	2.00	>100.00	>100.00

Table 9-34. Chronic Toxicity Results from Major Outfall Stations

			Fathead minnow (<i>Pimephales promelas</i>)							
			Survival				Reproduction			
Site	Event	Event Date	NOEC (%)	Tuc	IC₂₅ (%)	IC₅₀ (%)	NOEC (%)	Tuc	IC₂₅ (%)	IC₅₀ (%)
MO-CAM	Event (Wet) 1	10/5/2011	100.00	1.00	>100.00	>100.00	100.00	1.00	>100.00	>100.00
MO-OJA	Event (Wet) 1	10/5/2011	100.00	1.00	>100.00	>100.00	100.00	1.00	>100.00	>100.00
MO-MEI	Event (Wet) 1	10/5/2011	100.00	1.00	>100.00	>100.00	100.00	1.00	>100.00	>100.00
MO-OXN	Event (Wet) 1	10/5/2011	100.00	1.00	>100.00	>100.00	100.00	1.00	>100.00	>100.00
MO-SPA	Event (Wet) 1	10/5/2011	50.00	2.00	>100.00	>100.00	100.00	1.00	94.2	>100.00

			Daphnid <i>Ceriodaphnia dubia</i>							
			Survival				Reproduction			
Site	Event	Event Date	NOE C (%)	Tu c	IC₂₅ (%)	IC₅₀ (%)	NOE C (%)	Tuc	IC₂₅ (%)	IC₅₀ (%)
MO- VEN	Event 1 (Wet)	10/5/2011	100.0 0	1.0 0	>100.0 0	>100.0 0	100.0 0	1.0 0	>100.0 0	>100.0 0
MO- FIL	Event 1 (Wet)	10/5/2011	100.0 0	1.0 0	>100.0 0	>100.0 0	100.0 0	1.0 0	>100.0 0	>100.0 0
MO- HUE	Event 1 (Wet)	10/5/2011	100.0 0	1.0 0	>100.0 0	>100.0 0	100.0 0	1.0 0	>100.0 0	>100.0 0
MO- SIM	Event 1 (Wet)	10/5/2011	100.0 0	1.0 0	>100.0 0	>100.0 0	100.0 0	1.0 0	>100.0 0	>100.0 0
MO- THO	Event 1 (Wet)	10/5/2011	100.0 0	1.0 0	>100.0 0	>100.0 0	100.0 0	1.0 0	>100.0 0	>100.0 0

			Green alga <i>Selenastrum capricornutum</i>			
			Growth			
Site	Event	Event Date	NOE C (%)	Tu c	IC₂₅ (%)	IC₅₀ (%)
MO- MPK	Event 1 (Wet)	10/5/2011	100.0 0	1.0 0	>100.0 0	>100.0 0

According to the NPDES permit, a Toxicity Identification Evaluation (TIE) must be performed on samples exhibiting significant toxicity, defined in the permit as at least 50% mortality (IC₅₀ < 100%). For tests with only one endpoint where survival is not measured, such as the purple sea urchin or green alga, a TIE is triggered when the primary endpoint of the test has greater than 50% effect. For the purple sea urchin, this equates to a fertilization rate of less than 50%. For the green alga, it equates to growth that is less than half of that of the control sample.

A closer inspection of the tables reveals that there were two stations (ME-SCR using the purple sea urchin and MO-SPA using the fathead minnow) in which the TUC exceeded 1.00 and the NOEC was below 100%. TIEs were not run on these samples because the IC₅₀ for these sites was always greater than 100%, meaning the sample would have to be concentrated to kill 50% of the organisms in the sample. More detailed results are available in Appendix I in Attachment E.

9.7 DRY-SEASON, DRY-WEATHER ANALYTICAL MONITORING

As described in the NPDES permit, dry weather monitoring is required once during each dry season (May 1 – September 30) at sites selected to be representative of runoff from each of the Permittees jurisdictions (each city and the county unincorporated area) in Ventura County. For most jurisdictions, monitoring occurred at the associated Major Outfall monitoring station; however, as anticipated, inadequate flow was encountered at three of the Major Outfall stations prompting the relocation of these sampling sites. Receiving water monitoring is not part of this Permit requirement.

The eight jurisdictions with sampleable dry-season, dry-weather Major Outfall locations were: Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Simi Valley, Thousand Oaks, and Ventura. For the remaining three jurisdictions, the list of alternate sites was used to select a location with adequate flow. For Santa Paula, the site was moved from the 11th Street Drain to Fagan Canyon, for Port Hueneme, the site was moved upstream to Bubbling Springs Park, and the County Unincorporated site was moved from Happy Valley Drain in Meiners Oaks to Medea Creek in Oak Park.

Sampling took place on two days. Fillmore-1 (MO-FIL), Ojai-1 (MO-OJA), Oxnard-1 (MO-OXN), Port Hueneme-3 (Bubbling Springs Park), Santa Paula-2 (Fagan Canyon), and Ventura-1 (MO-VEN) were sampled on August 15, 2012. Camarillo-1 (MO-CAM), Moorpark-1 (MO-MPK), Simi Valley-1 (MO-SIM), and Thousand Oaks-1 (MO-THO), and Unincorporated-2 (Medea Creek in Oak Park) were sampled on August 16, 2012. There was at least 72 hours of dry weather preceding each sampling event.

As required by the NPDES permit, grab samples were collected and analyzed for total coliform, *E. coli*, total hardness, total organic carbon, and three dissolved metals: copper, lead, and zinc. Field observations and measurements were also taken. The results are presented in Appendix J and laboratory QA/QC is included in Appendix F in Attachment E. Constituents outside of water quality standards are in Table 9-35.

Uncommonly high elevated levels were seen for copper at Camarillo-1. In an effort to narrow down the potential source of the copper and bacteria follow-up samples were collected on October 17, 2012, (prior to the first rainfall of the wet season) at Camarillo-1 and three sites upstream to look for the source of the elevated levels of copper and *E. coli* detected during the DRY-2012 event. Since there are multiple connections to Camarillo Hills Drain upstream of the Camarillo-1 site and it is unknown which were flowing at time of sample collection during DRY-2012, follow-up results cannot be directly related to previously collected samples but any high results may indicate the geographic area of possible sources and create an opportunity to pinpoint and eliminate them. Results of the follow up sampling were not available at the time of this writing, and will be detailed in the next annual report.

Table 9-35. Dry Season constituents detected above water quality standards

Dry Season 2012 Elevated Levels							
Calleguas Creek Watershed							
Constituent	MO-CAM	MO-MPK	MO-SIM	MO-THO	Units	Basin Plan Objective	CTR Objective
E. coli	19863	2909	1616		MPN/100 mL	235	
pH	9.02				pH Units	8.5	
Copper, Dissolved	99 ^a				µg/L		26.77 ^a
^a Hardness = 360 mg/L							
Santa Clara River Watershed							
Constituent	DRY-SPA2	MO-OXN	MO-FIL	MO-VEN	Units	Basin Plan Objective	CTR Objective
E. coli		2142	1850		MPN/100 mL	235	
pH		8.64		8.76	pH Units	8.5	
Dissolved Oxygen			4.52		mg/L	5	
Copper, Dissolved				29.29 ^b	µg/L		26.77 ^b
^b Default Hardness = 400 mg/L							
Ventura River Watershed							
Constituent	DRY-UNI2	MO-OJA			Units	Basin Plan Objective	CTR Objective
E. coli	281	650			MPN/100 mL	235	
Pacific Ocean							
Constituent	DRY-HUE3				Units	Basin Plan Objective	CTR Objective
E. coli	9804				MPN/100 mL	235	
Dissolved Oxygen	3.89				mg/L	5	

9.8 BIOASSESSMENT MONITORING

As instructed in the current NPDES permit, the Stormwater Monitoring Program participated in the Southern California Regional Bioassessment program. This program was run by the Southern California

Coastal Water Research Project (SCCWRP) and included participation from multiple agencies and organizations. The Stormwater Monitoring Program was responsible for sampling 15 qualified probabilistic sites throughout Ventura County, divided among each of the three major watersheds (six in the Ventura River Watershed, six in the Calleguas Creek Watershed, and three in the Santa Clara River Watershed). Probabilistic site locations were randomly generated by SCCWRP and evaluated by District staff to ensure each site met the requirements of the program (e.g. accessible, perennial, permission granted etc.). Sites that did not meet the requirements of the program were rejected and evaluation of sites continued until the requisite number of sites were qualified. The Stormwater Monitoring Program was also responsible for sampling three trend sites, one in each of the three watersheds. Trend sites were selected for their location and are to be monitored each year for the duration of the study.

With help from Aquatic Bioassay & Consulting Laboratories, Inc. (ABC), sampling was conducted June 4, 2012, through July 19, 2012. The reconnaissance, chemistry, California Rapid Assessment Method (CRAM), physical habitat (P-HAB), and toxicity data was submitted electronically to SCCWRP by the appropriate due date (September 30, 2012 for reconnaissance; October 31, 2012 for chemistry, CRAM, P-HAB, and toxicity). Taxonomic identification of invertebrates and algae is being undertaken by outside laboratories is not under the jurisdiction of the Stormwater Monitoring Program. This data is currently due to SCCWRP by February 28, 2013.

A technical and non-technical report summarizing the first year's data (2009) was released in 2011 and is available at SCCWRP's website www.sccwrp.org. SCCWRP and the SMC do not currently plan to produce interim reports for the second through fourth years (2010 - 2012) of the study. Links to all reports will be included in future Annual Water Quality Monitoring Reports, as they become available.

9.9 BEACH WATER QUALITY MONITORING

The Permit requires the Program to fund beach water quality monitoring in accordance with procedures and locations used in AB411 monitoring at ten sites if funding from state and federal sources is not available. Those funds were available during the reporting period so the County of Ventura Environmental Health Department conducted ocean water quality monitoring at 40 sites along the Ventura County coast, including the ten sites listed in the Permit. The Program was not involved in the monitoring, however, the results of that monitoring is summarized in Table 9-36 below. Compliance with limits set by the State of California for each parameter was achieved in over 98.9% of samples. *Heal the Bay's 2011-2012 Annual Beach Report Card* gave Ventura County Beaches an A grade for both wet and dry weather. Grades are given on an A to F scale, with higher grades representing lower risk of illness for beachgoers.

Table 9-36 Beach Water Quality Monitoring Results July 1, 2011 through June 30, 2012

	Total Coliform (TC)	Fecal Coliform (FC)	Enterococcus (Entero)	FC:TC
Number of Samples	1,581	1,581	1,580	1,581
SS Limit (MPN/100mL)	10,000	400	104	N/A
SS Limit (Ratio)	N/A	N/A	N/A	Ratio > 0.1 and TC > 1,000
No. Samples > SS Limit	8	13	16	9
% Samples within limits	99.4	99.1	98.9	99.4

SS = Single Sample

9.10 PYRETHROID INSECTICIDES STUDY

Summary

Pyrethroid insecticide monitoring of sediments is required by Monitoring Program No. CI 7388, as part of the Ventura County Municipal Separate Storm Sewer System National Pollutant Discharge Elimination System Permit, Order No. R4-2010-0108 (Permit). The Permit specifies that the Principal Permittee shall perform a pyrethroid insecticides study to accomplish the following objectives:

- i. Establish baseline data for major watersheds;
- ii. Evaluate whether pyrethroid insecticide concentrations are at or approaching levels known to be toxic to sediment-dwelling aquatic organisms;
- iii. Determine if pyrethroids discovered are from urban sources; and
- iv. Assess any trends over the permit term.

No significant levels of pyrethroids or sediment toxicity were detected at any of the monitored sites.

In April 2012 the Ventura County Watershed Protection District (District), as the Principal Permittee, conducted sediment monitoring for the Pyrethroid Insecticides Study (Study) at two locations in both the Ventura River and Santa Clara River watersheds. In addition, Pyrethroid analysis of sediments in the Calleguas Creek Watershed (CCW) is conducted annually in August as part of the CCW Toxicity Total Maximum Daily Load (TMDL) monitoring program. Data from the TMDL was used to meet the requirements for that watershed, as allowed by the Permit.

Four pyrethroids were detected in the Study samples and varied depending on site. The four detected pyrethroids were bifenthrin (three sites), pendimethalin (two sites), permethrin (one site) and dichloran (one site). Toxicity units were calculated based on the concentration of the pyrethroid (normalized for total organic carbon) and the known *Hyaella azteca* LC50, if available. All calculated toxicity units were less than one indicating the samples were non-toxic. This is also supported by the lack of toxicity seen in the analysis of the sediment samples.

Three years of data (2008-2010) are currently available for the TMDL site (03_UNIV) that was selected as the most representative of urban land use in the Calleguas Creek Watershed. Data for 2011 and 2012 will become available after the TMDL annual reports are submitted in February 2013 and 2014, respectively. Pyrethroids were not detected in the three years of samples, which prevents the calculation of toxicity units; however using the MDL in the calculation provided an estimated upper limit of toxicity units for the sample. Eight of the eighteen calculated data points were above one, which indicates that if pyrethroids were present, but just below detectable levels, there could be a contribution to sediment toxicity. Toxicity was not observed in the corresponding sediment samples, which suggests that concentrations of pyrethroids in the samples, if present, are well below the MDL.

Due to the absence of significant toxicity in the samples, there are no recommendations to mitigate urban contributions of pyrethroids in the three sampled watersheds at this time other than to continue the Ventura Countywide Stormwater Management Program's current pesticide use education and outreach efforts. The Program plans to add Calleguas Creek Watershed sample sites to the Study for 2015 to avoid issues with different detection levels and sampling strategies for the next reporting cycle.

Methods

The Permit allows the Pyrethroid Insecticides Study (Study) requirement to be satisfied by another tributary monitoring program within the watershed if pyrethroid concentrations and sediment toxicity are being assessed. Monitoring in the Calleguas Creek watershed for the Calleguas Creek Toxicity Total Maximum Daily Load (TMDL) meets the study requirements, so this data was used for the Calleguas Creek watershed component. Monitoring for this project has been conducted annually in August since 2008. The data will be released once the TMDL annual report has been submitted, so data collected in 2011 will become available in February 2013 and data collected in 2012 will become available in February 2014. For this reason, this report summarizes the 2008-2010 data. The 2011 and 2012 data will be included in the next report. The Ventura River and Santa Clara River watersheds do not have monitoring programs that meet the Study requirements, so a Pyrethroid Insecticides Study Quality Assurance Project Plan (QAPP) was developed for monitoring these two watersheds. The Study was designed to be similar to the TMDL monitoring project in regard to sample collection method and analyte list. The two projects differ in placement of sites, sampling frequency, and time of year for analysis.

In-stream sediment samples for chemical analysis and toxicity testing were collected using stainless steel scoops according to methods developed by the USGS and outlined in *Guidelines for Collecting and Processing Samples of Stream Bed Sediment for Analysis of Trace Elements and Organic Contaminants for the National Water Quality Assessment Program (1994)*. When possible, sediment sampling stations encompassed a section of the reach approximately 100 meters in length upstream from water-column sampling stations but this varied depending on site conditions. Five to ten wadeable depositional zones (low energy areas where fine-grained particles can accumulate) within the reach were targeted to obtain a sample representative of the site.

All sediment samples were analyzed for total organic carbon (TOC) by EPA 9060 and pyrethroids, GC/MS NCI-SIM for the Study and EPA 8270C (SIM) for the TMDL. Two of five TMDL sites and all Study sites were analyzed for toxicity to 7 to 10 day old *Hyalella azteca*, as described in *Aquatic Toxicity Due to Residential use of Pyrethroid Insecticides*²². Water quality field measurements were taken with hand-held probes.

The stainless steel trowels used by the Study were cleaned prior to sample collection with Citranox laboratory detergent and tap water, rinsed with distilled water, and air dried. They were then sealed individually in Ziploc bags until arrival at the site. An equipment blank was collected by the laboratory from one clean, unused stainless steel trowel by rinsing with one liter of laboratory grade de-ionized water and analyzing the rinsate for TOC by SM 5310C and pyrethroids by GC/MS NCI-SIM. The re-analysis of the equipment blank required a second rinse of the trowel (to collect the required sample volume) with one liter of laboratory grade de-ionized water and analysis by GC/MS NCI-SIM.

The Permit specifies that monitoring is to be conducted every three years, after sediment has settled within the water body and safe access can be assured. For the Study, this translated to April 3, 2012, three days after a small storm (<0.3" precipitation) and 9 days after a larger storm (1.5" precipitation). Sampling for the TMDL is conducted annually in August.

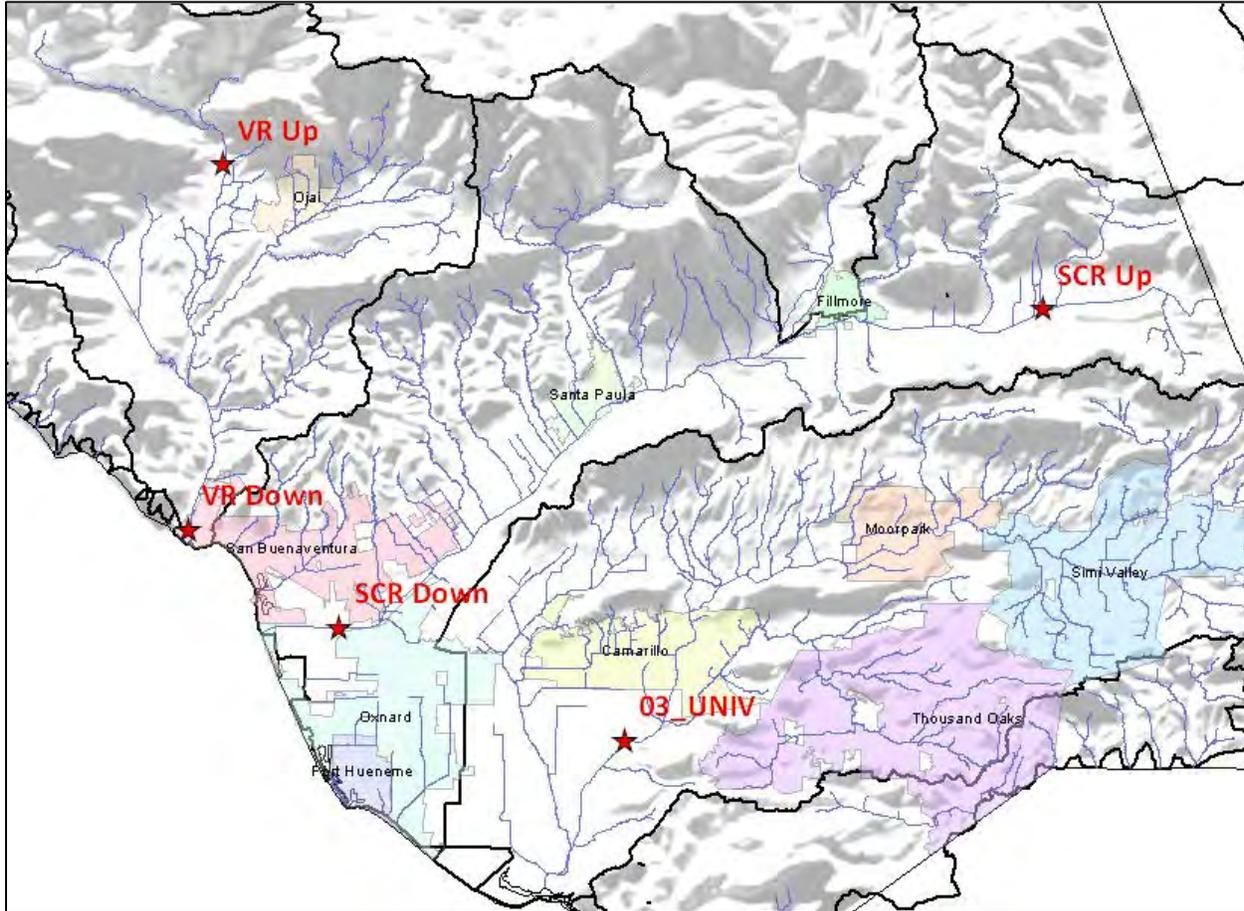
²² *Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides*; Weston, D., Holmes, R., You, J., Lydy, M.J (2005). Environ. Sci. Technol.; (Article); 2005; 39(24); 9780 pp.

Ventura and Santa Clara River Watersheds

For the Study, an upstream and a downstream site were selected on the main stems in the Ventura and Santa Clara River watersheds (Figure 9-19). The upstream site was located high in the watershed to reduce the influence of urban sources and the downstream site was located low in the watershed to include urban contributions. For the Ventura River, the upstream site is above the Casitas Municipal Water District's diversion structure near the north end of Rice Road in Meiners Oaks (VR Up, Figure 9-20). The downstream site is near the Main Street Bridge in Ventura (VR Down, Figure 9-21). For the Santa Clara River, the upstream site is east of Torrey Road in Fillmore²³ (SCR Up, Figure 9-22) and the downstream site is near the Victoria Avenue Bridge in Ventura (SCR Down, Figure 9-23). Factors such as safety, ease of entry, upstream land use, hydrology, and long term accessibility including landowner permission were considered in site selection.

²³ Note that urban and agricultural areas are present upstream of Fillmore beyond the Ventura County boundary.

Figure 9-19 Pyrethroid Sampling Locations 2012



As described in the Ventura County MS4 Pyrethroid Insecticides Monitoring Quality Assurance Project Plan (QAPP), the top layer (~1 cm) of recently deposited sediment was collected with a pre-cleaned stainless steel scoop as specified in the permit. The quantity of sediment required for the tests precluded sampling directly into glass jars, so the sediment was deposited in a 24" by 36" 2mm polyethylene bag per site. The bag was closed and the sediment was manually homogenized onsite by squeezing and rotating the bag. Homogenized sediment was placed in two 8 oz wide-mouth glass jars and placed on ice for TOC and pyrethroid analysis. The jars were placed in the freezer at the end of the sampling day so that they could be frozen for pickup by the chemistry lab courier the following day. The remaining sediment (~ 3 liters) was double-bagged and put on ice for (same day) delivery to the toxicity lab.



Figure 9-20. VR Up



Figure 9-21. VR Down



Figure 9-22. SCR Up



Figure 9-23. SCR Down

Calleguas Creek Watershed

The Calleguas Creek Watershed is unusual because most of its developed areas are in the upper portions of the watershed with the lower portions heavily influenced by agriculture. The monitoring plan for the TMDL selected sites by subwatershed and appears to have focused on agricultural areas. The TMDL site that best represents the urban contribution of the watershed is 03_UNIV, which is on Calleguas Creek at University Drive, downstream of the Cities of Thousand Oaks, Moorpark, Simi Valley, and parts of Camarillo (Figure 9-19). This site has been monitored for total organic carbon, pyrethroids in sediment, and toxicity to *Hyalella azteca* since August 2008.

As described in the Calleguas Creek Watershed Management Plan Quality Assurance Project Plan Monitoring and Reporting Program Plan for the Nitrogen, OC and PCBs, Toxicity, and Metals and Selenium Total Maximum Daily Loads (TMDL QAPP), sediment samples were collected from the top two to three centimeters (cm) of sediment using pre-cleaned stainless steel trowels. Collecting a thicker

layer of sediments is a common approach to conducting sediment sampling for the purpose of sediment toxicity testing and is the approach used in sediment toxicity studies conducted by the Southern California Coastal Water Research Project (SCCWRP) Bight Program and the State Water Resources Control Board Bay Protection and Toxic Cleanup Program (BPTCP). The sediment samples were collected directly into a clean polyethylene bag and mixed. Subsamples from the bag were placed into glass jars for pyrethroid and TOC analysis and the remaining sediment was kept in the bag for toxicity analysis. All samples were stored at 4°C until arrival at the contract laboratory.

Results

Study Equipment Blank

The initial analysis of the equipment blank detected a small amount of TOC and detectable amounts of the pyrethroids bifenthrin, cypermethrin, and pendimethalin (Table 9-37). In order to have sufficient volume to re-test the equipment blank, the laboratory rinsed the trowel a second time with one liter of deionized water and the rinsate was analyzed for pyrethroids. Pyrethroids were not detected in the second sample (please refer to discussion section, below).

Table 9-37. Equipment Blank Results

Analyte	Trowel Blank (Initial Analysis) ($\mu\text{g/L}$, MDL varies)	Trowel Blank (Initial Analysis) Total Mass (μg)	Trowel Blank (Re-analysis) ($\mu\text{g/L}$, MDL varies)
Allethrin	ND (<0.00085)	ND (<0.00085)	ND (<0.00085)
Bifenthrin	0.0041	0.0041	ND (<0.00079)
Cyfluthrin	ND (<0.00083)	ND (<0.00083)	ND (<0.00083)
Cypermethrin	0.0026	0.0026	ND (<0.00066)
Deltamethrin/Tralomethrin	ND (<0.0019)	ND (<0.0019)	ND (<0.0019)
Dichloran	ND (<0.00080)	ND (<0.00080)	ND (<0.00080)
Esfenvalerate	ND (<0.00098)	ND (<0.00098)	ND (<0.00098)
Fenvalerate	ND (<0.00098)	ND (<0.00098)	ND (<0.00098)
L-Cyhalothrin	ND (<0.0012)	ND (<0.0012)	ND (<0.0012)
Pendimethalin	0.0025	0.0025	ND (<0.00050)
Permethrin	ND (<0.0050)	ND (<0.0050)	ND (<0.0050)
Prallethrin	ND (<0.00092)	ND (<0.00092)	ND (<0.00092)
Sumithrin	ND (<0.0024)	ND (<0.0024)	ND (<0.0024)
Tefluthrin	ND (<0.00093)	ND (<0.00093)	ND (<0.00093)
TOC	0.17 mg/L (DNQ)	0.17 mg (DNQ)	N/A

Analyte listed in Permit
Detections
ND = Not Detected
N/A = Not Applicable

Santa Clara and Ventura Rivers

Toxicity (survival) was not observed in any of the four samples collected by the Study (SCR Up, SCR Down, VR Up, and VR Down). The *H. azteca* percent survival ranged from 83.75% at VR Up to 98.75% at SCR Up. TOC amounts were lower in the Santa Clara River (5.4 g/kg SCR Up and 11 g/kg SCR Down) than in the Ventura River (22 g/kg VR Up and 26 g/kg VR Down), which may be due to the sandy substrate of the Santa Clara River. TOC was higher in the downstream site for each watershed. Detectable amounts of bifenthrin, dichloran, pendimethalin, and permethrin were seen at least one of the four sites (Table 9-38). Each site had a detectable amount of at least one pyrethroid (permethrin, dichloran, bifenthrin, and/or pendimethalin).

Table 9-38. Study Results 2012 - as reported by laboratory

Analyte	VR Up	VR Down	SCR Up	SCR Down	MRL	Units
Allethrin	ND	ND	ND	ND	0.5	ng/g
Bifenthrin	ND	1.2	0.78	0.74	0.5	ng/g
Cyfluthrin	ND	ND	ND	ND	0.5	ng/g
Cypermethrin	ND	ND	ND	ND	0.5	ng/g
Deltamethrin/Tralomethrin	ND	ND	ND	ND	0.5	ng/g
Dichloran	ND	ND	ND	0.54	0.5	ng/g
Esfenvalerate	ND	ND	ND	ND	0.5	ng/g
Fenpropathrin (Danitol)	ND	ND	ND	ND	0.5	ng/g
Fenvalerate	ND	ND	ND	ND	0.5	ng/g
L-Cyhalothrin	ND	ND	ND	ND	0.5	ng/g
Pendimethalin	ND	ND	0.69	5.4	0.5	ng/g
Permethrin	5.3	ND	ND	ND	0.5	ng/g
Prallethrin	ND	ND	ND	ND	0.5	ng/g
Sumithrin	ND	ND	ND	ND	0.5	ng/g
Tefluthrin	ND	ND	ND	ND	0.5	ng/g
TOC	22	26	5.4	11	Varies	g/kg
Toxicity	83.75%	88.75%	98.75%	96.25%		% Survival

Analyte listed in Permit
Detections
ND = Not Detected
NA = Not Applicable

Calleguas Creek

Toxicity to *Hyalella azteca* (survival) was not observed in the three samples collected at 03_UNIV between 2008 and 2010. The percent survival ranged from 96.3% in 2008 to 77.5% in 2010. TOC amounts were between 0.2 g/kg (2008) and 3.8 g/kg (2009). Pyrethroids were not detected in any of the three samples. The TMDL results for 03_UNIV are shown in Table 9-39.

Table 9-39. TMDL Results 2008-2010 - as reported by laboratory

Analyte	2008		2009		2009		Units
	Results	MDL	Results	MDL	Results	MDL	
Allethrin	ND	0.5	ND	0.5	ND	0.616	µg/kg
Bifenthrin	ND	0.5	ND	0.5	ND	0.616	µg/kg
Cyfluthrin, beta	ND	10	ND	10	NS	NS	µg/kg
Cypermethrin	NS	NS	NS	NS	NS	NS	µg/kg
Danitol	ND	0.5	ND	0.5	ND	0.616	µg/kg
Deltamethrin	ND	0.5	ND	0.5	ND	0.616	µg/kg
Dichloran	NS	NS	NS	NS	NS	NS	µg/kg
Esfenvalerate/Fenvalerate, total	ND	0.5	NS	NS	NS	NS	µg/kg
Fenvalerate	ND	0.5	ND	0.5	ND	0.616	µg/kg
Fluvalinate	ND	0.5	ND	0.5	ND	0.616	µg/kg
L-Cyhalothrin	ND	0.5	ND	0.5	ND	0.616	µg/kg
Pendimethalin	NS	NS	NS	NS	NS	NS	µg/kg
Permethrin	ND	5	ND	5	ND	6.16	µg/kg
Prallethrin	ND	0.5	ND	0.5	ND	0.616	µg/kg
Resmethrin	ND	5	ND	5	NS	NS	µg/kg
Sumithrin	NS	NS	NS	NS	NS	NS	µg/kg
Tefluthrin	NS	NS	NS	NS	NS	NS	µg/kg
Total Organic Carbon (g/kg)	0.2	0.01	3.8	0.01	1.5*	0.1	g/kg
Toxicity to <i>Hyalella azteca</i>	96.3		88.8		77.5		% Survival

Analyte listed in Permit
Detections
* = DNQ
ND = Not Detected
NS = Not Sampled

Discussion of Results

The source of the detected amounts of the pyrethroids bifenthrin, cypermethrin, and pendimethalin in the original equipment blank is uncertain. Since the laboratory only collected sufficient volume of rinsate to analyze for pyrethroids once, the re-analysis required additional volume which was collected by rinsing the trowel a second time with one liter of laboratory grade deionized water. No pyrethroids were detected in the second analysis. Because the original sample was not available for re-analysis, the source of the contamination cannot be determined. The original rinse may have removed the pyrethroid contaminants from the trowel, they may have dissipated in the time between rinses, or the equipment blank may have been contaminated during rinsate collection and/or analysis at the laboratory.

Regardless of whether the pyrethroid contamination occurred at the laboratory or was present on the trowel, the amount of contamination is insignificant in comparison to the amounts detected in the environmental samples. The total mass of each pyrethroid detected in the one liter of equipment blank rinsate is equal to the concentration, since the total rinsate volume was one liter. This amount is at least two orders of magnitude below the concentrations detected in the environmental samples. The amounts of pyrethroids detected in the environmental samples could be considered to be upper limits for those constituents that were also detected in the equipment blank. The laboratory determined that the initial detection of pyrethroids in the equipment blank may have been due to laboratory contamination, however since the re-analysis involved collecting a separate volume of rinsate, this cannot be confirmed.

The amount of TOC measured in the equipment blank was at least four orders of magnitude below the environmental samples and so can be considered insignificant.

Toxicity levels vary between pyrethroids. Toxicity units (TU) can be used to compare the relative toxicity of different samples and pyrethroids. This is done by normalizing the sediment pyrethroid concentrations to TOC concentration to account for hydrophobicity and then dividing by the *Hyalella azteca* ten day median lethal concentration (LC50) for each detected pyrethroid, if available. The overall pyrethroid toxicity of a particular sample can be calculated by summing the calculated pyrethroid TU for that sample.

The calculated toxicity units from the Study samples were all less than one (Table 9-40) and so the samples can be considered non-toxic. Even though an LC50 for dichloran or pendimethalin is unavailable, the lack of toxicity in the environmental sample infers a calculated TU of less than one for these analytes. The calculated TUs were inversely correlated with the observed toxicity, possibly due to the presence of unanalyzed constituents in the sample.

Pyrethroids were not detected in the samples collected in 2008, 2009, and 2010 from the Calleguas Creek watershed site (03_UNIV). The Permit requested that pyrethroid detection limits be as close to 1 ng/g (dry weight) as reasonably achievable. Since the pyrethroid detection limits for the TMDL were above this amount and all the results were non-detects, the MDL was used in place of a measured result in order to calculate the maximum possible TU for each analyte in each sample, for pyrethroids with available LC50s. Pyrethroid concentrations at the MDL were above one for eight of the eighteen calculable data points (Table 9-40). Toxicity was not observed in any of the three 03_UNIV samples, which suggests that concentrations of pyrethroids in the samples, if present, would be at concentrations well below the MDL for each analyte. Pyrethroids were detected in sediment samples from some of the other TMDL sites in the Calleguas Creek watershed; however they were at sites where agriculture is the predominant land use.

Pesticide Reduction Efforts

Integrated Pest Management Programs

A model integrated pest management (IPM) program was drafted through the Public Agencies Activities Subcommittee and used as a template by the Permittees to



Spanish Language Pesticide Outreach

develop their own plans by November 2009. This standardized protocol is posted on Program's website at www.vcstormwater.org/documents/subcommittees_publicagency/publications/VC_Pesticide_Protocol_10-09.pdf.

The prevention of pesticides from harming non-target organisms is the primary goal of the Permittees IPM program. The intent is to focus on preventing pesticides, fertilizers, and herbicides from entering the storm drain system and discharging to receiving waters. This protocol is applicable to 1) the outdoor use of pesticides, herbicides, and fertilizers; 2) the use of pesticides and fertilizers where the materials may come into contact with precipitation; 3) the use of pesticides, herbicides, and fertilizers where these materials may come into contact with runoff (natural or induces); and 4) the use of pesticides, herbicides, or fertilizers anywhere where they may be directly or indirectly discharged to a storm drainage system.

An effective IPM program includes the following elements:

- Pesticides are used only if monitoring indicates they are needed according to established guidelines.
- Treatment is made with the goal of removing only the target organism.
- Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial, nontarget organisms, and the environment.
- Its use of pesticides, including Organophosphates and Pyrethroids do not threaten water quality.
- Partner with other agencies and organizations to encourage the use of IPM.
- Adopt and verifiably implement policies, procedures, and/or ordinances requiring the minimization of pesticide use and encouraging the use of IPM techniques (including beneficial insects) in the Permittees' overall operations and on municipal property.
- Policies, procedures, and ordinances shall include commitments and timelines to reduce the use of pesticides that cause impairment of surface waters by implementing the following procedures:
 - Quantify pesticide use by its staff and hired contractors.
 - Prepare and annually update an inventory of pesticides used by all internal departments, divisions, and other operational units.
 - Demonstrate reductions in pesticide use.

The protocol is applicable to any Permittee staff and contracted services that apply pesticides, fertilizers, or herbicides. Such staff commonly include, park, public works, purchasing, building/grounds maintenance, hazardous materials, and pesticide application staff. It is not applicable to the indoor use of pesticides, herbicides or fertilizers, but is applicable to the consequential outdoor handling, mixing, transport, or disposal of materials related to indoor use. This protocol also does not apply when another NPDES permit and/or abatement orders are in effect at the selected site. Furthermore, this protocol is not intended to replace federal or state requirements or provide complete directions for applying, handling, transporting, mixing, or storing pesticides, fertilizers, or herbicides.



Proper Pesticide Use Newspaper Advertisement

Public Outreach and Education on Pesticide Use

Timed to coincide with the spring planting season, the Program’s outreach effort (Community for a Clean Watershed) ran a five-week pesticide campaign in 2010 utilizing television and radio campaign elements from past year’s creative arsenal. The animated “More, Better” television commercial graphically demonstrated how using too much pesticide runs into the storm drains, eventually making it into the Watershed, adversely affecting plants and animals. The radio spot was a humorous adaptation of the television ad, featuring the two animated characters as they defend their house against garden pests and inadvertently poison the watershed. An animated web banner corresponded with both broadcast media while the transit shelters took a more direct approach showing a snail and telling residents “Don’t kill an ocean just to keep pests out of your garden.”

Retail Partnership Brochures: Nurseries and Gardeners,

Watershed Protection Tip pamphlets aimed at residents were created to encourage best practices in their homes. These brochures were distributed to targeted retail stores to reach the population that is likely involved in the activities. The colorful pamphlet defines the Watershed, explains the storm drain system, how polluted water is damaging and gives both overall and topic-specific tips for how to keep the Watershed clean. In this case the one aimed at gardeners talks about plant selection, irrigation, fertilizer and pesticide practices, integrated pest management and proper yard maintenance.

Recommendations

Due to the absence of significant toxicity in the samples, there are no recommendations to mitigate urban contributions of pyrethroids in the three sampled watersheds at this time other than to continue the Ventura Countywide Stormwater Management Program's current pesticide use and public education and outreach efforts. The Program plans to include Calleguas Creek Watershed sample sites in the Study for 2015 to avoid issues with different detection levels and sampling strategies for the next reporting cycle. Additionally, the Program will review its procedures and methods to ensure the highest quality data is generated from the 2015 Pyrethroid Study.

The Watershed Should Only Shed Water
The storm drain system is a vast network.

Watershed Protection Tips for Gardeners

What Is Our Watershed?
Our watershed is the total land area, including your yard, from which stormwater drains into streams, rivers or other bodies of water. In Ventura County our primary watersheds drain into the Ventura and Santa Clara Rivers, Malibu and Calleguas Creeks and the marinas and estuaries that flow into the Pacific Ocean.

Clean Gardening Practices

Plant Selection
Select pest-resistant and drought-tolerant native plants for your garden to reduce the need for pesticides. Fertilizers and water. Create landscape areas that are safe for children and pets. Collect and filter any potentially polluted runoff from paved surfaces. Go to www.waterworks.com for a California-Friendly Gardening Guide.

Irrigation
Save water and money by substituting your sprinkler system. Irrigate after dusk or early in the morning when less water is lost to wind and evaporation. Even during the hot summer months, there is no need to water every day. Restrictly fix leaks and damaged sprinkler heads to minimize runoff that carries pollutants into the storm drain system.

Fertilizers & Pesticides
Overuse of any pesticide or fertilizer is a key contributor to stormwater pollution. Apply only as needed and as directed on the label, and always wear under cover, out of the rain. Never use fertilizers or pesticides around water, drains, lawn grounds or if rain is predicted within 24 hours. Avoid using copper sulfate root killing products. Pesticides that contain diazinon or chlorpyrifos have been banned and should be disposed of at your local Household Hazardous Waste* collection center or event.

Integrated Pest Management (IPM)
IPM is an eco-friendly approach to effective pest management. Its goal is to use less toxic methods to reduce the use of pesticides, creating a system that is safe for your family and the environment. To learn more, go to the UC Davis IPM resource site at ipm.ucdavis.edu.

Maintenance
Clear, mow and recycle yard debris such as leaves and grass clippings by placing them in your yard waste bin or by composting. Even organic waste, when flushed or blown into storm drains, can create flooding and pollute the watershed. Rotting plant material can also reduce the oxygen available for aquatic wildlife and increase the presence of harmful bacteria.

*Do not dispose of any liquids and items of Household Hazardous Waste collection centers and events throughout Ventura County.

Gardening Retail Partnership Brochure

Table 9-40. Study Normalized TOC Results and Toxicity Units

Analyte	NORMALIZED TO TOC [Pyrethroid]/TOC					LC ₅₀ <i>H. azteca</i> (µg/g TOC)	TOXICITY UNITS ([Pyrethroid]/TOC)/LC ₅₀				
	VR Up	VR Down	SCR Up	SCR Down	Units	LC50* (µg/g)	VR Up	VR Down	SCR Up	SCR Down	Units
Allethrin	ND	ND	ND	ND	µg/g		ND	ND	ND	ND	TU
Bifenthrin	ND	0.046	0.144	0.067	µg/g	0.52	ND	0.088462	0.27692	0.128846	TU
Cyfluthrin	ND	ND	ND	ND	µg/g	1.08	ND	ND	ND	ND	TU
Cypermethrin	ND	ND	ND	ND	µg/g	0.38	ND	ND	ND	ND	TU
Deltamethrin/Tralomethrin	ND	ND	ND	ND	µg/g	0.79	ND	ND	ND	ND	TU
Dichloran	ND	ND	ND	0.049	µg/g		ND	ND	ND	NA	TU
Esfenvalerate	ND	ND	ND	ND	µg/g	1.54	ND	ND	ND	ND	TU
Fenpropathrin (Danitol)	ND	ND	ND	ND	µg/g	1.1**	ND	ND	ND	ND	TU
Fenvalerate	ND	ND	ND	ND	µg/g		ND	ND	ND	ND	TU
L-Cyhalothrin	ND	ND	ND	ND	µg/g	0.45	ND	ND	ND	ND	TU
Pendimethalin	ND	ND	0.128	0.491	µg/g		ND	ND	NA	NA	TU
Permethrin	0.241	ND	ND	ND	µg/g	10.83	0.022253	ND	ND	ND	TU
Prallethrin	ND	ND	ND	ND	µg/g		ND	ND	ND	ND	TU
Sumithrin	ND	ND	ND	ND	µg/g		ND	ND	ND	ND	TU
Tefluthrin	ND	ND	ND	ND	µg/g		ND	ND	ND	ND	TU
TOC	22	26	5.4	11	g/kg		22	26	5.4	11	g/kg
Toxicity, survival	83.75	88.75	98.75	96.25	%		83.75	88.75	98.75	96.25	%

Analyte listed in Permit
Detections
ND = Not Detected
NA = Not Available
* (Amweg, Weston, You, & Lydy, 2006)
** (Delgado-Moreno, Lin, Veiga-Nascimento, & Gan, 2011)

Table 9-41 MDL Normalized to TOC and corresponding Toxicity Units

Analyte	Method Detection Limit (MDL)				MDL NORMALIZED TO TOC (MDL/TOC)				LC ₅₀ <i>H. azteca</i> (µg/g TOC)	TOXICITY UNITS AT MDL (MDL/TOC)/LC50			
	2008	2009	2010	Units	2008	2009	2010	Units	LC50* (µg/g)	2008	2009	2010	Units
Allethrin	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g		NA	NA	NA	TU
Bifenthrin	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g	0.52	4.81	0.25	0.79	TU
Cyfluthrin, beta	10	10	NA	µg/kg	50	2.6316	NA	µg/g	1.08	46.30	2.44	NA	TU
Cypermethrin	NA	NA	NA	µg/kg	NA	NA	NA	µg/g	0.38	NA	NA	NA	TU
Deltamethrin	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g	0.79	3.16	0.17	0.52	TU
Dichloran	NA	NA	NA	µg/kg	NA	NA	NA	µg/g		NA	NA	NA	TU
Esfenvalerate/ Fenvalerate, total	0.5	NA	NA	µg/kg	2.5	NA	NA	µg/g	1.54	1.62	NA	NA	TU
Danitol	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g	1.1**	2.27	0.12	0.37	TU
Fenvalerate	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g		NA	NA	NA	TU
Fluvalinate	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g		NA	NA	NA	TU
L-Cyhalothrin	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g	0.45	5.56	0.29	0.91	TU
Pendimethalin	NA	NA	NA	µg/kg	NA	NA	NA	µg/g		NA	NA	NA	TU
Permethrin	5	5	6.16	µg/kg	25	1.3158	4.1067	µg/g	10.83	2.31	0.12	0.38	TU
Prallethrin	0.5	0.5	0.616	µg/kg	2.5	0.1316	0.4107	µg/g		NA	NA	NA	TU
Resmethrin	5	5	NA	µg/kg	25	1.3158	NA	µg/g		NA	NA	NA	TU
Sumithrin	NA	NA	NA	µg/kg	NA	NA	NA	µg/g		NA	NA	NA	TU
Tefluthrin	NA	NA	NA	µg/kg	NA	NA	NA	µg/g		NA	NA	NA	TU
TOC	0.2	3.8	1.5*	g/kg	0.2	3.8	1.5*	g/kg		0.2	3.8	1.5*	g/kg
Toxicity, survival	96.3	88.8	77.5	%	96.3	88.8	77.5	%		96.3	88.8	77.5	%
Analyte listed in Permit	* (Amweg, Weston, You, & Lydy, 2006)												
Detections	** (Delgado-Moreno, Lin, Veiga-Nascimento, & Gan, 2011)												
NA = Not Available													

BIBLIOGRAPHY

WORKS CITED

Amweg, E. L., Weston, D. P., You, J., & Lydy, M. J. (2006). Pyrethroid Insecticides and Sediment Toxicity in Urban Creeks from California and Tennessee. *Environmental Science & Technology* , 40, 1700-1706.

Delgado-Moreno, L., Lin, K., Veiga-Nascimento, R., & Gan, J. (2011). Occurrence and Toxicity of Three Classes of Insecticides in Water and Sediment in Two Southern California Coastal Watersheds. *Journall of Agricultural and Food Chemistry* , (59) 9448-9456.

Weston, D., Holmes, R., You, J., & Lydy, M. (2005). Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides. *Environmental Science & Technology* , 39(24); 9780 pp.

Attachments

Attachment A Commercial and Industrial Inspection Checklists

Attachment B Post Construction BMP Inspection Checklist

Attachment C Construction Inspection Checklist

Attachment D Illicit discharge Field Screening Protocol

Attachment E Water Quality Monitoring Report Appendices

Attachment A - Industrial/Commercial Inspection Checklist

Attachment A – Commercial Inspection Checklist



City of Camarillo – Public Works Dept. 805-383-5659

Work Order #: _____

STORMWATER INSPECTION CHECKLIST FOR COMMERCIAL BUSINESSES

FOOD SERVICE, AUTO-RELATED LAUNDRY NURSERY FACILITIES

INSPECTION TYPE: 1st Routine¹ 2nd Routine² Complaint Response Follow-up Visit
 INSPECTION DATE: _____ TIME: _____
 INSPECTOR NAME: _____ PHONE #: _____
 FACILITY NAME: _____ FACILITY ADDRESS: _____
 FACILITY CONTACT NAME: _____ PHONE #: _____
 FACILITY CONTACT SIGNATURE (acknowledging receipt of insp.): _____
 FACILITY SIC/NAICS # _____ CATEGORY: _____
 FACILITY IS LOCATED IN Calleguas Creek Watershed and discharges to Revolon Slough; Beardsley Wash; Conejo; Calleguas
(Circle one Water body)

Does Facility discharge to MS4 that directly discharges to an ESA? Yes No If yes, is there an approved TMDL Implementation Plan? Yes No

BMP #	Inspection Criteria	Yes	No ³	N/A
1	SC-10 Unauthorized Non-stormwater discharges. Are controls being implemented to eliminate non-stormwater discharges?			
2	SC-11 Accidental Spills/Leaks. Is the facility effectively preventing and responding to spills and leaks?			
3	SC-20 Vehicle/Equipment Fueling. Are effective fueling source control devices and practices being implemented?			
4	SC-21 Vehicle/Equipment Cleaning. Are effective equipment/vehicle cleaning practices and appropriate wash water management practices being implemented?			
5	SC-22 Vehicle/Equipment Repair. Are effective vehicle/equipment repair practices and source control devices being implemented?			
6	SC-30 Outdoor Loading/Unloading. Are effective outdoor loading/unloading practices being implemented?			
7	SC-31 Outdoor Liquid Storage. Are effective outdoor liquid storage source controls and practices being implemented?			
8	SC-32 Outdoor Equipment Operations. Are effective outdoor equipment source control devices and practices being implemented?			
9	SC-33 Outdoor Storage of Raw Materials. Are effective source control practices being implemented and appropriate structural devices being used and maintained?			
10	SC-34 Storage and Handling of Solid Waste. Are effective solid waste storage/handling practices and control measures being implemented?			
11	Grease Trap/Clarifier Info. Is Grease Trap/Clarifier being properly maintained? Size of Trap/Clarifier _____ Last Svc. Date: _____			
12	<small>By Municipality</small> Waste/Hazardous Materials Storage, Handling & Disposal. Are effective storage, handling and disposal procedures for hazardous materials being implemented?			
13	SC-41 Building and Grounds Maintenance. Are effective facility maintenance practices being implemented?			
14	SC-43 Parking/Storage Area Maintenance. Are effective parking/storage area designs and housekeeping/maintenance practices being implemented?			
15	SC-44 Storm Water Conveyance System Maintenance Practices. Are proper conveyance system operation and maintenance protocols being implemented?			
16	Post Construction Treatment Device. If facility has treatment device, is it being properly maintained? Device Type: _____			

¹ 1st Routine inspection is due by 7/8/2012; ² 2nd Routine inspection is due not earlier than 6 months after the 1st insp. and not later than 7/8/2015
³ Note Violation/Correction Needed in Comments Section

ENFORCEMENT ACTION TAKEN

Verbal Warning	Cease & Desist Order Issued
Notice of Noncompliance (1 st written notice via City Storm Water Mgr. ltr.)	Referred to LA Regional Water Board
Administrative Compliance Order Issued (2 nd written notice via City PW Dir. ltr.)	Legal Action Initiated

FOLLOW-UP INSPECTION NECESSARY? YES NO

OUTREACH MATERIAL GIVEN TO FACILITY: _____
(List type of material (Business brochure, BMP fact sheet #)

COMMENTS: (Identify # violated above, type of violation and suggested corrective action needed.)

White – Storm Water File

Yellow – Storm Water Inspector

Pink – Facility Copy

10-2010

Attachment A - Industrial Inspection Checklist



City of Ventura Environmental and Water Resources Division - Environmental Services
STORMWATER INSPECTION CHECKLIST FOR INDUSTRIAL FACILITIES

INSPECTION TYPE: 1st Routine 2nd Routine 3rd Routine-No Exp. Ins. Complaint Response Follow-up Ins.

INSPECTION DATE: _____ TIME: _____

INSPECTOR NAME: _____ PHONE #: _____

FACILITY NAME: _____

FACILITY ADDRESS: _____

FACILITY CONTACT NAME: _____ PHONE #: _____

FACILITY CONTACT SIGNATURE (acknowledging receipt of insp.): _____

FACILITY'S CNAICS # _____ CATEGORY _____

FACILITY IS LOCATED In: Ventura River, Santa Channel, Lower Santa Clara River, Watershed (Circle one: Water Study)
 Does Facility discharge to MSWRF or directly discharge to an ESB? If Yes: No: If yes, a permit approved TMDL Implementation Plan? Yes No

State Industrial NPDES Permit Information		Yes	No	N/A		
Does facility have coverage/WQID # under State Industrial Permit?						
WQID # _____						
If facility has coverage/WQID # under State Industrial Permit, does facility have SWPPP on site?						
If facility's SIC code is identified in Category 10 of Attachment I to the Industrial Permit, does facility have any industrial materials, equipment or activities that are exposed to stormwater? (Category 10 includes SIC's 26,21,22,20,263, 25,265,267,27,263,265,36,37 (except 311),373,34 (except 3441),35,36,37(except 379),39,39a or 421,422)						
If a Category 10 SIC facility and no exposure, did facility file a Notice of Non-Applicability with the LARWQCB? Date filed: _____ LARWQCB Approval Letter Received: <input type="checkbox"/> Yes, attach copy to inspection form						
BMP #		BMP Inspect on Criteria		Yes	No	N/A
1	SC 10: Unauthorized Non-stormwater discharges. Are controls being implemented to eliminate non-stormwater discharges?					
2	SC 11: Accidental Spills/Leaks. Is the facility effectively preventing and responding to spills and leaks?					
3	SC 20: Vehicle/Equipment Fueling. Are effective fueling source control devices and practices being implemented?					
4	SC 21: Vehicle/Equipment Cleaning. Are effective equipment/vehicle cleaning practices and appropriate wash water management practices being implemented?					
5	SC 22: Vehicle/Equipment Repair. Are effective vehicle/equipment repair practices and source control devices being implemented?					
6	SC 30: Outdoor Loading/Unloading. Are effective outdoor loading/unloading practices being implemented?					
7	SC 31: Outdoor Liquid Storage. Are effective outdoor liquid storage source control and practices being implemented?					
8	SC 32: Outdoor Equipment Operations. Are effective outdoor equipment source control devices and practices being implemented?					
9	SC 33: Outdoor Storage of Raw Materials. Are effective source control practices being implemented and appropriate structural devices being used and maintained?					
10	SC 34: Storage and Handling of Solid Waste. Are effective solid waste storage/handling practices and control measures being implemented?					
11	Grease Trap Info. Is Grease Trap being properly maintained? Size of Trap: _____ Last Svc. Date: _____					
12	Waste/Hazardous Materials Storage, Handling & Disposal. Are effective storage, handling and disposal procedures for hazardous materials being implemented?					
13	SU-41: Building and Grounds Maintenance. Are effective facility maintenance practices being implemented?					
14	SU-42: Parking/Storage Area Maintenance. Are effective parking/storage area design and housekeeping/maintenance practices being implemented?					
15	SU-44: Storm Water Conveyance System Maintenance Practices. Are proper conveyance system operation and maintenance protocols being implemented?					
16	Appendix D Fast Shields. If applicable, is facility applying requirements on these fast shields?					
17	Post Construction Treatment Device. If facility has treatment device, is it being properly maintained? Device Type: _____					

1st Routine Inspect. due 6/30/10; 2nd Routine Inspect. for facilities with exposure due no earlier than 6 months after the 1st inspec. and not later than 9/30/10; 3rd Routine Inspect. yearly at min. of 70% of facilities determined not to have exposure (Not Applicably Later on File)
 *New construction/renovations in compliance with:

ENFORCEMENT ACTION TAKEN

Verbal Warning/Action Notice of Correction (1st written notice via City SW Insp.)	Cease & Desist Order Issued
Notice of Violation (2nd written notice via City Storm Water Insp.)	Referred to L.A. Regional Water Board
Administrative Compliance Order Issued (3rd written notice via City SW Insp. Dir. Inv.)	Legal Action Initiated

FOUROWLP INSPECTION NECESSARY? YES _____ NO _____

OUTREACH MATERIAL GIVEN TO FACILITY: _____
 (List type of material (Business brochure, BMP fact sheet, etc.))

COMMENTS: (Identify # violations above, type of violation and suggested corrective action needed.)
 (Use additional sheet for comments)

Stormwater Quality Program (805) 267-6374

Attachment B - Post Construction BMP Inspection Checklist

Attachment B - Post Construction BMP Checklist



**CITY OF CAMARILLO – PUBLIC WORKS DEPT. (805-383-5659)
STORM WATER POST-CONSTRUCTION TREATMENT DEVICE
INSPECTION CHECKLIST**

3/12/2010

Type of Device: _____ Location of Device: _____

Date of Inspection: _____ Inspector: _____

Photos Taken: Yes No Quantity: _____

Property Manager/Designee: _____ Company: _____

Mailing Address: _____

Phone Number: _____

Service Information:

Grassy swale/biofilter/grass strip, catch basin filter, clarifiers, pervious concrete, etc.

- Needs removal of litter and debris _____
- Needs to be swept _____
- Removal of accumulated sediment _____
- Reseed and/or apply mulch to damaged grass areas _____
- Other repairs/maintenance necessary: _____
- _____
- No Maintenance is needed at this time

Detention Basins

- Needs removal of litter and debris from banks and basin _____
- Repair erosion to banks and bottom _____
- Clean/repair inlet riprap and pilot channels _____
- Clean/repair outlet to prevent clogging _____
- Sediment accumulation of 25% or more of original depth (should be cleaned) _____
- Perimeter fencing needs repair _____
- Apply Mosquito abatement procedure _____
- Other repairs/maintenance necessary: _____
- _____
- No Maintenance is needed at this time

Additional Notes: _____

Outreach Material Given to Facility: _____

Is follow-up inspection needed?

- Yes No

Inspector Signature

Date

Attachment C - Construction Inspection Checklist

Attachment C - Construction Inspection Checklist



CITY OF CAMARILLO – PUBLIC WORKS DEPT. (805-383-5659)
STORM WATER INSPECTION CHECKLIST
FOR CONSTRUCTION ACTIVITIES

10/6/09

Work Order: _____

Project Name: _____ Project #: _____

Project Location: _____ Grading Permit #: _____

Date/Time: _____ Quantity of Rainfall: _____

Contractor Information:

Contact Rep.: _____ Company Name: _____ Phone Number: _____

INSPECTION TYPE: Wet Season Dry Season Routine Follow-Up Pre-storm During-storm Post-storm Final

CONSTRUCTION PHASE: Grading & Land Dev Streets & Utilities Vertical Construction Final Landscaping

CONSTRUCTION REQUIREMENTS:

Is SWPPP/SWPCP on site: Yes No Is Notice of Intent WDID on site: Yes No N/A WDID #: _____

RISK DETERMINATION: Sediment and Receiving Water Risk Level: One Two Three

DEWATERING ACTIVITIES: Has a NPDES Permit been filed: Yes No If yes, is the Permit on site: Yes No

YES	NO	N/A	INSPECTION CRITERIA
			1. SITE PLAN: Does the site plan reflect the project site's condition(s)?
			2. SLOPE EROSION MANAGEMENT: Are slope erosion management BMP's in place per the SWPCP/SWPPP
			3. SEDIMENT TRAPPING: Are all sandbags, straw bales, and/or silt fences in place and are they functioning properly?
			4. SEDIMENT BASINS: If desilting or sediment basins are being used, are they functioning properly?
			5. SEDIMENT MANAGEMENT AT DRAINAGE DISCHARGE POINTS: Are the drainage discharge points reasonably free of any significant erosion or sediment transport?
			6. SITE SEDIMENT MANAGEMENT: Is sediment, debris, or mud contained within the site?
			7. PUBLIC ROAD SEDIMENT MANAGEMENT: Are ingress and egress locations to the construction area stabilized to prevent the tracking of construction materials offsite or onto impervious areas?
			8. MATERIALS MANAGEMENT: Are material handling and storage areas reasonably clean and free of spills, leaks, or any other harmful materials?
			9. MATERIALS MAINTENANCE: Are all materials properly covered/contained?
			10. DESIGNATED MATERIAL STORAGE AREA: Are all locations of temporary soil stockpiles or construction materials in approved areas?
			11. VEHICLE & EQUIPMENT MAINTENANCE: Are all the equipment storage, cleaning, fueling, and maintenance areas reasonably clean and free of spills, leaks, or any other harmful materials?
			12. PAINT, CONCRETE & SAW CUTTING WASTE MANAGEMENT: Are waste containment areas functioning properly?
			13. BMP IMPLEMENTATION: Has an effective combination of BMPs been selected for the project site?
			14. BMP INSTALLATION & MAINTENANCE: Are the BMPs identified on the SWPCP/SWPPP, and/or installed in the proper location according to plan specifications?
			15. POST-CONSTRUCTION BMPs: Have post-construction BMPs been inspected prior to issuing the Certificate of Occupancy?
			16. HIGH RISK SITES: Has the project proponent's qualified SWPPP personnel inspected the site's BMPs during installation and weekly during the wet season (October-April)?
			17. BMP LOG: Is a log kept on site which indicates BMPs are being evaluated, maintained and/or modified in the event that they fail or are not appropriate?
			18. ILLCIT DISCHARGE (CIP): Is non-stormwater runoff leaving the site?
			19. PUBLIC PROJECT (CIP) SWPPP/PCP: Does the SWPPP/PCP have the required training and inspection records?

Field Directive Issued: Yes No

Non-Compliance Issued: Yes No

Verbal Stop Work Order Citation
 Warning Notice of Violation

Notes/Comments: _____

Inspector _____

Phone Number _____

Contractor's Signature _____

(Acknowledging receipt of Inspection Report)

White – Storm Water File

Yellow – Storm Water Inspector

Pink – Site Copy

Attachment D - Illicit Discharge Field Screening Protocol

Attachment D Illicit discharge Field Screening Protocol

Draft 10-Mar-2010

ILLICIT CONNECTIONS AND ILLICIT DISCHARGES (IC/IDS) ELIMINATION PROGRAM

FIELD SCREENING PROTOCOL

PERMITTEE'S NAME

1.0 PURPOSE AND OBJECTIVES

This Field Screening Protocol was prepared by the *Permittee's Name*. The purpose of this Field Screening Protocol is to present *Permittee's Name's* approach and procedures to complete illicit connections and illicit discharges (IC/IDs) field screening requirements under the Los Angeles Regional Water Quality Control Board Order No. 09-0057, National Pollutant Discharge Elimination System (NPDES) Permit No. CAS004002, Waste Discharge Requirements for the Stormwater (Wet Weather) and Non-Stormwater (Dry Weather) Discharges from the Municipal Separate Storm Sewer Systems (MS4) NPDES Permit (Permit) within the Ventura County Watershed Protection District, County of Ventura, and the Incorporated Cities therein. Implementation of the Ventura County MS4 Permit is directed by the Ventura Countywide Storm Water Quality Management Program formed by the Ventura County Watershed Protection District, County of Ventura, cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura (Ventura), Santa Paula, Simi Valley, and Thousand Oaks.

2.0 IC/ID ELIMINATION PROGRAM REQUIREMENTS

The following is taken verbatim from the Subpart 4.H. of the Ventura County MS4 Permit. Each Permittee shall implement an IC/IDs program to eliminate, document, track, and report IC/IDs to the storm drain system, as follows:

1. General

- a) Implementation - Each Permittee shall implement an IC/ID Program. The IC/ID procedures shall be documented and made available for public review.
- b) Tracking - All Permittees shall, no later than May 7, 2012, map at a scale and in a format specified by the Principal Permittee all known connections to their storm drain system. **All Permittees shall map at a scale and in a format specified by the Principal Permittee incidents of illicit connections and discharges since January 2009 on their baseline maps, and shall transmit this information to the Principal Permittee no later than May 7, 2012.** Permittees shall use this information to identify priority areas for further investigation and elimination of IC/IDs.

Attachment D Illicit discharge Field Screening Protocol

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2. Public Reporting

- a) Permittees shall establish and maintain a phone hotline and internet site to receive all reports of IC/ID complaints.
- b) Permittees shall document the location of the reported IC/ID and the actions undertaken in response to all IC/ID complaints.

3. Illicit Connections

- a) Screening for Illicit Connections
 - (1) Each Permittee shall submit to the Principal Permittee:
 - (A) A map at a scale and in a format specified by the Principal Permittee showing the location and length of underground pipes 18 inches and greater in diameter, and channels within their permitted area and operated by the Permittee in accordance with the following schedule:
 - (i) All channeled portions of the storm drain system no later than May 7, 2010.
 - (ii) All portions of the storm drain system consisting of storm drain pipes 36 inches in diameter or greater, no later than May 7, 2012. This provision is not meant to exclude Permittees from using equally effective alternative methods not listed in the manual.
 - (iii) All portions of the storm drain system consisting of storm drain pipes 18 inches in diameter or greater, no later than May 7, 2014.
 - (B) The status of suspected, confirmed, and terminated illicit connections.
 - (2) Permittees shall conduct field screening of their storm drain systems in accordance with screening procedures described in the *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments* (2004)¹. Permittees shall conduct field screening of their storm drain system that has not been previously screened and reported to the Regional Board, for illicit connections in accordance with the following schedule:
 - (A) All portions of the storm drain system consisting of storm drain pipes 36 inches in diameter or greater, no later than May 7, 2012.
 - (B) High priority areas identified during the mapping of illicit connections and discharges, no later than May 7, 2012.
 - (C) All portions of storm drain systems 50 years or older in age, no later than May 7, 2012.
 - (3) Each Permittee shall maintain a list containing all connections under investigation for possible illicit connection and their status.

¹ *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments*. The Center for Watershed Protection, PWS R., October 2004. Chapter 13, 13.1, 13.2, 13.3, 13.4

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b) Response to Illicit Connections

(1) Investigation -

Each Permittee, upon discovery or upon receiving a report of a suspected illicit connection, shall complete an investigation within 21 days, to determine the following:

- (A) Source of the connection.
- (B) Nature and volume of discharge through the connection.
- (C) Responsible party for the connection.

(2) Termination -

Each Permittee, upon confirmation of an illicit storm drain connection, shall ensure the following:

- (A) Termination of the connection within 180 days of completion of the investigation, using formal enforcement authority to eliminate the illicit connection.

(3) Documentation -

Each Permittee shall keep records of all illicit connection investigations and the formal enforcement taken to eliminate all illicit connections.

4. *Illicit Discharges*

(a) Investigation -

Each Permittee shall investigate an illicit/ illegal discharge during or immediately following containment and cleanup activities, and shall take appropriate enforcement action to eliminate the illegal discharge.

(b) Abatement and Cleanup -

Each Permittee shall respond, within 1 business day of discovery or a report of a suspected illicit/ illegal discharge, with actions to abate, contain, and/or clean up all illegal discharges, including hazardous waste.

DEFINITIONS

Channel - means an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two waterbodies.

Illegal Discharge - means any discharge to the municipal separate storm sewer (storm drain system) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illegal discharge includes all non-storm water discharges not composed entirely of storm water except discharges pursuant to an NPDES permit, discharges that are identified in part 1, "Discharge Prohibitions" of this order, or discharges authorized by the Regional Water Board Executive Officer.

Illicit Connection - means any engineered conveyance that is connected to the storm drain system without a permit or municipal authorization. It also means any engineered conveyance through which

Attachment D Illicit discharge Field Screening Protocol

~~Draft 10-Mar-2010~~

discharges of pollutants to the separate storm drainage systems, which are not composed entirely of storm water or are not authorized by an NPDES permit, may occur.

Illicit Discharge - means any discharge to a municipal separate storm sewer (storm drain system) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illicit discharge includes all non-storm water discharges not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges that are identified in part 1, "Discharge Prohibitions" of this order, or authorized by the Regional Water Board Executive Officer.

Illicit Disposal - means any disposal, either intentionally or unintentionally, of material(s) or waste(s) that can pollute storm water.

Open Channel - means a storm drainage channel that is not a natural water course.

Screening - means using proactive methods to identify illicit connections through a continuously narrowing process. The methods may include: performing baseline monitoring of open channels, conducting special investigations using a prioritization approach, analyzing maintenance records for catch basin and storm drain cleaning and operation, and verifying all permitted connections into the storm drains. Special investigation techniques may include: dye testing, visual inspection, smoke testing, flow monitoring, infrared, aerial and thermal photography, and remote control camera operation.

3.0 INFRASTRUCTURE PROFILE

- *Briefly characterize storm drain system and sewers within the MS4 system (size, age, condition)*
- *Useful statistics to consider (number of storm drain outfalls, miles of storm drain pipe, total stream and channel miles, total areas serviced by storm drain, sewer, and septic tanks)*
- *Reference or include maps as appropriate*

4.0 LEGAL AUTHORITY

In accordance with Subpart 3.B of the Ventura County MS4 Permit, each Permittee shall possess the necessary legal authority to prohibit illicit connections and illicit discharges, and to remove illicit connections. To ensure uniform and consistent countywide approach and to provide a legal underpinning to the entire Ventura Countywide NPDES Stormwater Program, a Model Stormwater Quality Ordinance was developed, which was adopted subsequently by all Permittees with some minor jurisdiction-specific changes. The current Stormwater Quality Ordinance was adopted by *Permittee's Name* on *date*.

In addition, each Permittee has designated Authorized Inspector(s) responsible for enforcing the Ordinance. The Authorized Inspector(s) is the person designated to investigate compliance with, detect violations of and/or take actions pursuant to the Ordinance.

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- *Provide reference to specific sections of the Permittee's Ordinances for IC/ID prohibition, elimination and enforcement actions,*
- *Determine if any permits are required to implement IC/ID Plan,*
- *Determine if effective inter-departmental coordination and cooperation currently occur*
- *Summarize enforcement capability or include enforcement plan if available*

5.0 MAPPING

As listed in the Section 2 of this Protocol, item a).(1).(A) in paragraph 3 "Illicit Connections", the Ventura County MS4 Permit contains specific mapping requirements including due dates for submittal of the required maps to the Principal Permittee. *Permittee's Name* is in the process of mapping all known connections within its jurisdiction.

- *Summarize current status of your mapping efforts*
- *Are maps of the storm drain system readily available?*
- *Determine system gaps that require mapping; describe how maps will be updated*
- *Determine if storm drain maps include coverage of sanitary and storm sewer networks*

6.0 STAFF ASSIGNED FOR FIELD SCREENING

The *Permittee's Name* selected the following staff to complete field and office assignments as a part of the IC/IDs field screening requirements presented in Section 2 of this Protocol:

Name	Position	Organization	Phone Number	Responsibility

The staff selected for field and office assignments will have adequate training to follow this Field Screening Protocol and ensure compliance with the Ventura County MS4 Permit. The training will include basic field training, inspection, data collection, health and safety, and operation and calibration of field instruments.

- *Determine staff needs to complete field work*
- *Determine staff needs to complete data analysis and reporting*

7.0 IC/ID TRACKING AND ELIMINATION CAPABILITY

In order to meet Ventura County MS4 Permit requirements presented in Section 2 of this Protocol, the *Permittee's Name* selected the following individuals to support implementation of the IC/IDs Elimination Program:

Attachment D Illicit discharge Field Screening Protocol

Draft 10-Mar-2010

Name	Position	Affiliation	Phone Number	Responsibility

The proposed staff and contractors are appropriately trained to respond to IC/IDs, spills, overflows, hazardous material emergencies that occur within *Permittee's Name's* jurisdiction. In the event that IC/IDs investigation and elimination involves more than one Permittee, the contact information presented in [Table 1](#) should be used for notification. Each involved Permittee will be notified as responsible parties are identified.

- *Define responsibilities of Agency(ies), assigned personnel, pre-approved contractors to respond to spills, overflows, hazardous material emergencies,*
- *Determine if personnel is properly equipped and trained to respond to illicit connection*
- *Define strategy for keeping information up-to-date*
- *Define strategy for sharing tracking information among Agencies involved*

8.0 FIELD INSTRUMENTS AND ANALYTICAL LABORATORY

The following field instruments are identified as required and available to complete IC/IDs requirements of the Ventura County MS4 Permit presented in [Section 2](#) of this Protocol:

Field Instrument	Parameters to be Measured	Technical Specifications	Calibration Information
		Exhibit A	Exhibit A

In the event that water sample is required for off-site laboratory analysis, *Permittee's Name* has an on-going contract with *Laboratory Name*. The laboratory contact name is _____ and he/she can be reached at _____. Sample collection details are provided in [Exhibit B](#). Results of lab analysis will be provided to _____ for data analysis and implementation as described in [Section 10](#).

- *Determine requirements for field instruments*
- *Provide calibration procedures and forms*
- *Provide contact and contract information for the analytical laboratory*
- *Provide a sample collection checklist and chain-of-custody forms*

9.0 EDUCATION AND OUTREACH

Public Education is an essential part of a municipal stormwater program because changing public behavior can create a real reduction in environmental pollution. When a community has a clear understanding of where the pollution comes from, how it can affect them and what they can do to stop

Attachment D Illicit discharge Field Screening Protocol

Table 1
Ventura County Illicit Discharge Response Contact List

Prepared on 15-Jan-10

Permittee	Dispatch	Primary Contact Name	Primary Contact Office Phone Number	Primary Contact Cell Phone Number	Alternate Contact Name	Alternate Contact Office Phone Number	Alternate Contact Cell Phone Number
Camatillo	(805) 388-5338	n/a	n/a	n/a	n/a	n/a	n/a
Fillmore	(805) 524-3701						
Moorpark	(805) 517-6257	Shaun Kroes	805-517-6257	n/a	Yugal K. Lali	805-617-6255	805-218-5861
Cjai	(805) 640-2560	Brian Meadows	805-646-5581 ext 114	805-797-1594	n/a	n/a	n/a
Oxnard	(805) 271-2220	Dispatch	(805) 271-2220	n/a	Mark Purnford	(805) 271-2220	n/a
Port Hueneme	(805) 936-6507	Wastewater Div.	805 936-6561	n/a	n/a	n/a	n/a
Santa Paula	(805) 933-4212	Jon Turner	(805) 933-4212 ext 303	(805) 850-8562	Richard Jones	(805) 933-4212 ext 310	(805) 320-0497
Simi Valley	(805) 583-6400	Dispatch	805-583-6400	n/a	Ron Linton	805-583-6429	805-297-8110
Thousand Oaks	(805) 449-2400	PW Counter	805/449-2400	n/a	Bob Carson	805/449-2499	n/a
Ventura	(805) 667-6510	ID Hotline	805-667-6510	n/a	Karen Sedlacek	805-667-6517	805-207-6371
Ventura County	(805) 650-4064	Paul Tantet	(805) 662-6737	(805) 901-4763	Ewelina Mutkowska	(805) 645-1382	(805) 765-5068
Ventura County EHD - for sewage/wastewater discharges	(805) 654-2813	Dispatch	(805) 654-2813 After Hours On-call Emergency Response # (805) 320-6244		n/a	n/a	n/a
Ventura County EHD - for hazardous waste and materials	(805) 654-2813	Dispatch	(805) 654-2813	n/a	n/a	n/a	n/a
VC PWA Transportation Dispatch: www.pwa.road@ventura.org	(805) 672-2131	Road Maintenance Dispatch	(805) 672-2131	n/a	n/a	n/a	n/a
Ventura County WPD	(805) 650-4064	Greg Martinez	805-672-2102	805-340-1175	Karl Novak	805-672-2106	805-804-7792

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it, they will be more likely to support the program, change their own practices, and help educate others.

The on-going countywide outreach campaign includes the following key elements:

- Watershed Awareness
- Public Awareness Surveys
- Identification of general and specific goals of the program
- Identification of target audiences and key messages for those audiences
- Development of program strategies and plan overview
- Pollution prevention program using a unified "brand name"
- Development of a watershed based outreach program
- Identification of opportunities to reach out to regulatory agencies
- Development of a model public education/public participation strategy for localization at the Permittee level
- Development and implementation of a school-aged children education outreach program
- Development and implementation of food facilities outreach program materials
- Development and implementation of automotive facilities outreach program materials
- Development and implementation of industrial facilities outreach program materials

The public outreach materials are available at http://www.vcstormwater.org/programs_residential.html

Permittee's Name have established a hotline at (805) XX-XXXX for illicit discharge reporting that has enabled easy reporting and improved response hotline.

- *Determine availability of*
 - *Hotline*
 - *Website to post outreach materials*
 - *Any community events to spread the message*
 - *Outreach materials*

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10.0 IMPLEMENTATION PLAN

10.1 General

Permittee's Name will complete field screening of its storm drain system **no later than May 7, 2012**. Based on Ventura County MS4 Permit requirements, the screening will include the following system portions that have not been previously screened for illicit connections:

- a) All portions of the storm drain system consisting of storm drain pipes 36 inches in diameter or greater;
- b) High priority areas identified during the mapping of illicit connections and discharges; and
- c) All portions of storm drain systems 50 years or older in age.

In addition, *Permittee's Name* continues responding to IC/IDs discovered during the industrial/commercial business inspections, its routine operation and maintenance activities, or as reported by the public.

10.2 Desktop Assessment to Support Field Screening (Optional)

Desktop Assessment provides a prioritization approach for completing screening requirements within the *Permittee's Name's* jurisdiction. The EPA Guidance recommends Desktop Assessment for municipalities with 20 or more stream miles of the storm drain system required for ID/IC screening.

Desktop Assessment was used by *Permittee's Name* to define where to begin searching for IC/ID problems in *Permittee's Name's* community. It involved processing and analysis of available mapping data to quickly characterize and screen for IC/ID problems at the community and subwatershed scale. Key factors considered in the analysis included *water quality, land use, development age, sewer infrastructure, and outfall density*.

In accordance with *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments* (2004) the following 5 steps were applied:

Step 1: Delineate subwatersheds

Permittee's Name delineated the following subwatersheds *or other drainage units* within the community, refer to [Map X](#):

- 1)
 - + *List defined subwatersheds or drainage units*

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Step 2: Compile mapping layers and subwatershed data

Permittee's Name compiled available maps (Section 5) and data for each drainage unit (e.g., land use, age, outfalls, infrastructure history).

- *Summarize results of the map analysis; include layered maps if available.*

Step 3: Compute discharge screening factors (SF)

Out of 10 screening factors discussed in the EPA's Guidance Manual, *Permittee's Name* selected the following factors for the IC/ID problem analysis:

- Past Discharge Complaints and Reports
- Poor Dry Weather Water Quality
- Density of Generating Sites or Industrial NPDES Storm Water Permits
- Storm Water Outfall Density
- Age of Subwatershed Development
- Sewer Conversion
- Historic Combined Sewer Systems
- Presence of Older Industrial Operations
- Aging or Failing Sewer Infrastructure
- Density of Aging Septic Systems

The following are results of the SF analysis for *Permittee's Name's* community:

	SF 1	SF2	SF3	Raw IC/ID Problem Score	Normalized IC/ID Problem Score
<i>Subwatershed A</i>					
<i>Subwatershed B</i>					

Example

Basis for assigning scores (based on benchmarks) to assess IDP is as follows:

Past discharge complaints/reports: <5 = 1; 5-10 = 2; >10 = 3
 Dry weather water quality: <25% = 1; 25-50% = 2; >50% = 3
 Storm water outfall density: <10 = 1; 10-20 = 2; >20 = 3
 Average age of development: <25 = 1; 25- 50 = 2; > 50 = 3

- *Checked selected factors*
- + *Complete table:*

Step 4: Screening at the subwatershed and community level

Screen and rank illicit discharge potential at the subwatershed and community level

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The raw score values of the IC/ID potential problems were re-evaluated using SF data at the subwatershed and community level resulting in normalized scores listed above. Based on *Permittee's Name's* analysis, the following prioritization of the risk was determined:

- Highest risk at *Subwatershed X*
- Medium risk at *Subwatershed Y*
- Low risk at *Subwatershed Z*

Step 5: Generate maps to support field investigations

Incorporating all the Desktop Assessment results, *Permittee's Name* determined that communities A and B have minimal IC/ID problems, C and D exhibit clustered IC/ID problems, and E and F are of severe IC/ID problems, refer to *Map(s)*.

The desktop assessment completed by *Permittee's Name* is used to guide field screening by generating the following outcomes:

- 1) Screening problem catchments or subwatersheds,
- 2) Creation of GIS or other database system to track outfalls,
- 3) Gaining an overall assessment as to the severity of illicit discharge problems in the community, and
- 4) Generation of basic mapping for subsequent field work

10.3 Field Screening Methodology

The primary field screening tool recommended by the EPA IDDE Guidelines is the Outfall Reconnaissance Inventory (ORI), which is used to find IC/ID problems, develop a systematic outfall inventory, and map or verify existing maps of the MS4. The ORI is a stream walk designed to inventory and measure storm drain outfalls, and find and correct continuous and intermittent discharges and illicit connections.

During ORI walk, *Permittee's Name's* trained staff will use EPA's "Outfall Reconnaissance Inventory Field Sheets" provided in Exhibit C to record field information. These sheets will facilitate recording outfall locations and characteristics. Field crew will describe the following indicators for flowing and non-flowing outfalls as listed in the "Outfall Reconnaissance Inventory Field Sheets":

1. Odor (flowing outfalls only);
2. Color (flowing outfalls only);
3. Turbidity (flowing outfalls only);
4. Floatables (flowing outfalls only);
5. Outfall damage (both flowing and non-flowing outfalls);

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6. Deposits/stains (both flowing and non-flowing outfalls);
7. Abnormal vegetation (both flowing and non-flowing outfalls);
8. Poor pool quality (both flowing and non-flowing outfalls), and
9. Pipe benthic/algal growth (both flowing and non-flowing outfalls).

Permittee's Name will compile ORI data including field information, GPS data, and photographs of outfall locations.

The ORI can discover obvious discharges that are indicated by flowing outfalls with very high turbidity, strong odors and colors, or an "off the chart" value on a simple field test strip. When obvious discharges are found and physical indicators are present, refer to Figure 1 "Illicit Discharge Source Investigation Flow Chart", field crews will initiate response within 1 business day. ORI crews may also encounter a discharge of hazardous materials or wastewater that should be immediately referred to the appropriate agency for cleanup, refer Table 1 "Ventura County Illicit Discharge Response Contact List".

In order to complete investigation of the IC/ID source, *Permittee's Name* will select appropriate Investigative method from the following methods recommended in the US EPA Guidance Manual:

- Storm Drain Network Investigation (refer to subsection 10.3.1);
- Drainage Area Investigation (refer to subsection 10.3.2);
- On-site investigations (refer to subsection 10.3.3); and
- Septic system investigations (refer to subsection 10.3.4).

Detailed descriptions of the methods are provided in Chapter 13 of the *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments* (2004).

IC/ID discovery, investigation, and response will be documented using forms provided in Exhibit C. Appropriate information will be provided to Regional Water Quality Control Board in the Annual Report. In addition, per Permit requirements, *Permittee's Name* will map incidents of illicit connections and discharges since January 2009 on its baseline maps and transmit this information to the Principal Permittee no later than May 7, 2012.

10.3.1 Storm Drain Network Investigation

Field crews will strategically inspect manholes within the storm drain network system to measure chemical or physical indicators that can isolate discharges to a specific segment of the network. Once the pipe segment is identified, on-site investigations will be used to find the specific discharge or improper connection.

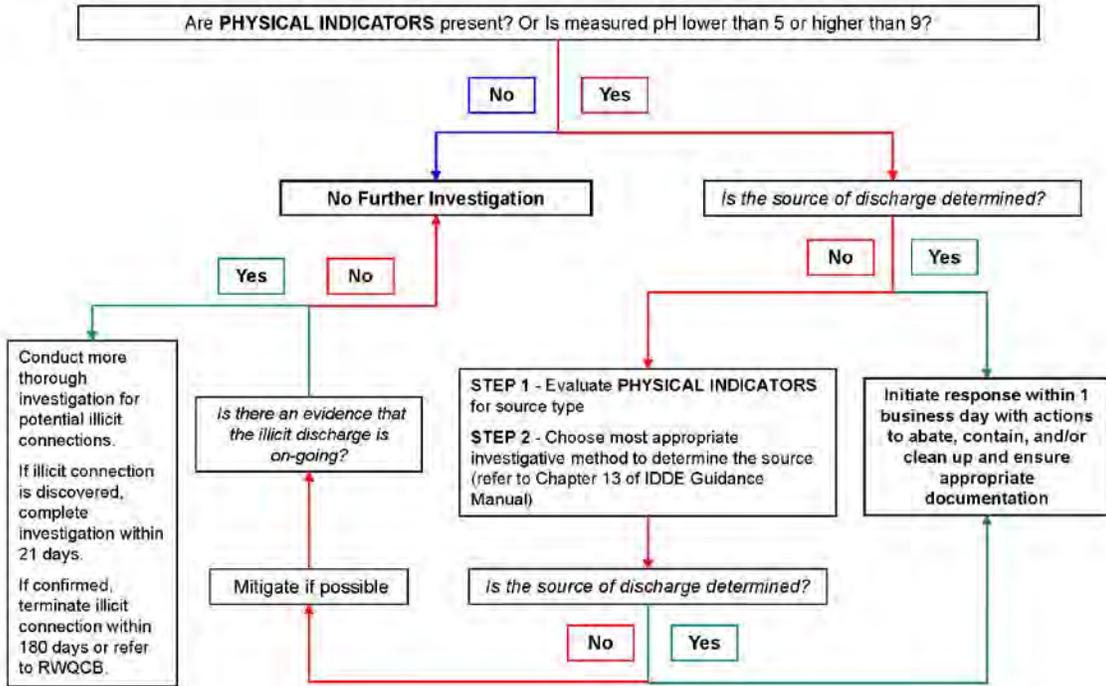
This method involves progressive visual inspections and/or sampling at manholes in the storm drain network to narrow the discharge to an isolated pipe segment between two manholes. When conducting a storm drain network investigation, field crews need to decide where and how to proceed with visual inspections and/or sampling in the network.

Attachment D Illicit discharge Field Screening Protocol

Figure 1 Illicit Discharge Source Investigation Flow Chart

STEP 1 – Complete Outfall Reconnaissance Inventory Field Sheet

STEP 2 – Notify other Permittees if observed discharge is present in their facilities



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The field crew should decide how to attack the pipe network that contributes to a problem outfall. Three options can be used:

- 1) Crews can work progressively up the trunk from the outfall and test manholes along the way.
- 2) Crews can split the trunk into equal segments and test manholes at strategic junctions in the storm drain system.
- 3) Crews can work progressively down from the upper parts of the storm drain network toward the problem outfall.

10.3.2 Drainage Area Investigation

This method relies on an analysis of land use or other characteristics of the drainage area that is producing the illicit discharge. The investigation can be as simple as a "windshield" survey of the drainage area or a more complex mapping analysis of the storm drain network and potential generating sites. Drainage area investigations work best when prior indicator monitoring reveals strong clues as to the likely generating site producing the discharge.

10.3.3 On-site Investigation (Optional)

On-site methods are used to trace the source of an illicit discharge in a pipe segment, and may involve dye, video or smoke testing within isolated segments of the storm drain network. While each approach can determine the actual source of a discharge, each needs to be applied under the right conditions and test limitations discussed in details in Chapter 13 of the *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments* (2004). It should be noted that on-site investigations are not particularly effective in finding *indirect* discharges to the storm drain network.

10.3.4 Septic System Investigation (Optional)

Low-density residential watersheds may require special investigation methods if they are not served by sanitary sewers and/ or storm water is conveyed in ditches or swales. The major illicit discharges found in low-density development are failing septic systems and illegal dumping. Homeowner surveys, surface inspections and infrared photography have all been effectively used to find failing septic systems in low-density watersheds.

10.4 Health and Safety Considerations

The field crew (2 staff at minimum) will be trained to raise awareness of many hazardous circumstances that they may confront when conducting field screening of the storm drain system. These health and safety guidelines can only be effective, however, if they are considered, discussed, and applied with a large dose of prudent judgment.

Communication is also a major component. When doubts and concerns arise, field crew will discuss the matter with a supervisor. Furthermore, always err on the side of safety when assessing risk. If there is any doubt whether task can be safely performed, ask the crew leader/supervisor for further instructions and help. Protecting personal safety is more important than completing a risky task – SAFETY FIRST!

ATTACHMENT 54

Los Angeles Regional Water Quality Control Board

June 4, 2015

Mr. Gerhardt Hubner
Deputy Director
Ventura County Watershed Protection District
800 S. Victoria Avenue
Ventura, CA 93009

RESPONSE TO REQUEST TO CONFIRM LEVEL OF EFFORT PRESCRIBED IN ORDER NO. R4-2010-0108, ATTACHMENT F, SECTION I.1.a.1.a.i, IN ACCORDANCE WITH NEW FIVE YEAR STUDY DESIGN FOR SMC REGIONAL BIOASSESSMENT PROGRAM

Dear Mr. Hubner:

We have received your request to confirm the level of effort required by the Ventura Countywide MS4 Permit Order No. R4-2010-0108 (Ventura County MS4 Permit) for bioassessment that will be met by implementing the new five-year study design for the Regional Bioassessment Program (Regional Program).

Attachment F, Section 1, of the Ventura County MS4 Permit, requires Permittees to participate in the Southern California Municipal Storm Water Monitoring Coalition's (SMC) Regional Bioassessment Program, which requires Permittees to conduct bioassessment monitoring at specified sites in Ventura County as part of the Regional Program. The Regional Program study, that was in effect at the time of the Ventura MS4 Permit issuance, was completed in 2013.

Ventura County Watershed Protection District's participation in the Regional Program was required to provide a level of effort that would fully support the Regional Program to prevent any data gaps in Ventura County. Understanding that the original Regional Program five-year study design (2009-2013) has been completed, and the Regional Program has been modified for 2015-2020, the specific level of effort described per watershed Attachment F, Section 1, of the Ventura County MS4 Permit, no longer reflects the current SMC Regional Program.

In your letter, requesting confirmation of bioassessment efforts required of the Ventura County Watershed Protection District, you note that 15 sites will be monitored but the location of the sites will be revised in accordance with the Regional Program design. As noted, this does not change the overall sampling effort, nor does it reduce the required effort at integrator sites.

The Regional Water Board Executive Officer or the Regional Board, consistent with 40 CFR 122.41, may approve changes to the Monitoring Program, after providing the opportunity for public comment, either:

- (a) By petition of the Principal Permittee or by petition of interested parties after submittal of the Monitoring Report. Such petition shall be filed not later than 60 days after the Monitoring Report submittal date, or
- (b) As deemed necessary by the Regional Water Board Executive Officer following notice to the Principal Permittee.

Pursuant to Part 7.C.2 of the Ventura County MS4 Permit, a 30-day public comment period is required prior to the Executive Officer's approval of the revised bioassessment monitoring sites. The public comment period will begin when the public notice is published on the Water Board's website. Your staff will be notified immediately prior to opening of the public comment period and the web posting of your letter requesting confirmation of your revised participation in the Regional Program:

http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/index.shtml#ventura

If you should have any questions regarding this letter please feel free to call me at (213) 576-6605 or your staff may contact Ivar Ridgeway at (213) 620-2150.

Sincerely,



Samuel Unger, P.E.
Executive Officer

cc: Ventura County MS4 Co-Permittees

ATTACHMENT 55

RETAIL GASOLINE OUTLETS: NEW DEVELOPMENT DESIGN STANDARDS FOR MITIGATION OF STORM WATER IMPACTS

Technical Report

June 2001

Dan Radulescu, and Xavier Swamikannu
California Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Phil Hammer
California Water Quality Control Board, San Diego Region
9771 Clairemont Mesa Blvd, Suite A
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Introduction

On March 8, 2000, the California Regional Water Quality Control Board, Los Angeles Region (LA Regional Board) issued requirements for new development and significant redevelopment consolidated in a Standard Urban Storm Water Mitigation Plan (SUSMP). The SUSMP included requirements for retail gasoline outlets (RGOs), commonly referred to as “gas stations”, among several other development categories. Several municipalities, the Building Industry of Southern California (BIA), and the Western States Petroleum Association (WSPA) appealed the action of the LA Regional Board to the State Water Resources Control Board (State Board) for review. The State Board issued its decision *In Re City of Bellflower et al.* (SUSMP Decision) in large part upholding the action of the LA Regional Board.

In its Order, the State Board set aside the numerical mitigation requirement for RGOs explaining that the decision did not preclude future inclusion of numerical mitigation standards for RGOs with proper justification.

On February 21, 2001, the California Regional Water Quality Control Board, San Diego Region (SD Regional Board) issued an MS4 permit for San Diego County and Cities which includes requirements for new development and significant redevelopment. The MS4 permit requires Permittees to develop a model SUSMP no later than February 21, 2002, that will establish new development controls for project categories including RGOs. The SD Regional Board did not propose a threshold for RGOs to apply numerical design standards, giving the MS4 permittees the first option to develop the threshold criterion for RGOs and the justification. On March 22, WSPA filed an appeal of the SD Regional Board action for review before the State Board contending that RGOs were being improperly subject to numerical design standards in the MS4 permit for San Diego County and cities.

Urbanization and Storm Water Quality

Urbanization alters the natural infiltration capability of the land and generates a host of pollutants that are entrained in storm water and urban runoff. These pollutants such as heavy metals and petroleum hydrocarbons result from the activities of dense human populations. The overall impact is an increase in storm water runoff volumes and pollutant loading in storm water discharged to receiving water-bodies.¹

Urban development increases the amount of impervious surface in a watershed as farmland, forests, and meadowlands with natural infiltration characteristics are converted into buildings with rooftops, driveways, sidewalks, roads, and parking lots with virtually no ability to absorb storm water. Storm water and snow-melt runoff wash over these impervious areas, picking up pollutants along the way while gaining speed and volume because of their inability to disperse and filter into the ground. What results are storm water flows that are higher in volume, pollutants, and temperature than the flows in less impervious areas, which have more natural vegetation and soil to filter the runoff.² In addition to impervious areas increase, urban development brings with it proportionately high levels of car emissions, car maintenance waste, pet waste, litter, pesticides, and household hazardous wastes, which may be washed into receiving waters by storm water or dumped directly into storm drains designed to discharge to receiving waters.

Most organic compounds found in storm water are associated with various human-related activities, especially automobile use, or are associated with plastics.³ Heavy metals found in storm water also mostly originate from automobile use activities, including gasoline combustion, brake lining, fluids, undercoatings, and tire wear.⁴

More recently, studies reveal a connection between urban development and contamination of local waterbodies. Studies found the highest levels of organic contaminants, known as polycyclic aromatic hydrocarbons (PAHs) (products of combustion including fossil

¹ U.S. EPA (1992). *Environmental Impacts of Storm Water Discharges: A National Profile*. EPA 841-R-92-001. Office of Water. Washington, DC.

² U.S. EPA (1997). *Urbanization and Streams: Studies of Hydrological Impacts*. EPA 841-R-97-009. Office of Water. Washington, DC.

³ Field, Richard, James P. Heaney and Robert Pitt. (2000). *Innovative Urban Wet-Weather Flow Management Systems*. Technomic Publishing Co., Inc. Lancaster.

⁴ See, Durum, W.H. (1974), *Occurrence of some trace metals in surface waters and groundwaters*. In Proceeding of the Sixteenth Water Quality Conference. Am. Water Works Assoc., et al. Univ. of Illinois Bull. 71(108). Urbana, IL.; Koeppel, D.E. (1977). *Comp. Vol. IV: Soil-water-air-plant studies*. In: Environmental Contamination by Lead and Other Heavy Metals. G.L Rolfe and K.A. Peinbold, eds. Institute for Environmental Studies. Univ. of Illinois. Urbana-Champaign, IL. July.; Rubin, A.J., ed. (1976). *Aqueous-Environmental Chemistry of Metals*. Ann Arbor Science Publishers. Ann Arbor, MI; Shaheen, D.G. (1975). *Contributions of Urban Roadway Usage to Water Pollution*. 600/2-75-004. U.S. Environmental Protection Agency. Washington, DC.; Solomon, R.L. and D.F.S. Natusch. (1977). Vol. III: *Distribution and characterization of urban dists*. In: Environmental Contamination by Lead and Other heavy Metals. G.L. Rolfe and K.G. Reinbold, eds. Institute for Environmental Studies. Univ. Of Illinois. Urbana-Champaign, IL.; and Wilber, W.G. and J.V. Hunter. (1980). *The Influence of Urbanization on the Transport of Heavy Metals in New Jersey Streams*. Water Resources Research Institute. Rutgers University. New Brunswick, NJ.

fuels combustion), in the reservoirs of urbanized watersheds.⁵ Studies also established a clear relationship between the adverse impact of urbanization and impairment of aquatic communities in receiving waterbodies.⁶

Federal Storm Water Regulations

Federal regulations require that MS4 permittees implement a program to control storm water pollution from new developments during and post-construction. Because there is no express national standard for the control of storm water pollutants from new developments, the permitting authority must defer to statements of policy and intent made by the U.S.EPA.

The U.S.EPA under Phase I regulations did not fully describe the expectations for MS4 Permittees in controlling post construction storm water discharges from new development and significant redevelopment except that “a comprehensive master plan” was required [55 *Fed Reg.* 48054]. For a better understanding of the regulatory expectation, we look to the Final Rule for Phase II storm water regulations. Therein, the U.S.EPA notes that “prior planning and designing for the minimization of pollutants in storm water is the most cost-effective approach to storm water quality management” [64 *Fed Reg.* 68759], and identifies four essential elements to control storm water from new development and redevelopment. These are, (i) to develop and implement strategies that include a combination of structural and non-structural BMPs; (ii) adopt an ordinance to address post construction runoff; (iii) ensure long term operation and maintenance of the BMPs; and (iv) ensure that controls are in place that will *minimize* water quality impacts. [Emphasis added] EPA goes on to say:

“The requirements[are] consistent with the permit application requirements for large MS4s for post-construction controls for new development and redevelopment.”

The permitting authority in order to comply with federal regulations must thus require the implementation of an MS4 program that will achieve all four enumerated objectives for new development and redevelopment. In order for the program to be enforceable, the program for new development and significant redevelopment must include objective criteria such as water quality design standards for treatment-control BMPs, for significant categories of development such as RGOs.

Further, the Federal Court of Appeals has unequivocally stated that Congress intended for “the Administrator or a State to design [substantive] controls” for storm water discharges from MS4s but did not mandate a particular approach [*NRDC v. USEPA*, 966 F.2d 1292 (9th Cir. 1992)]. The court held that it is appropriate to defer to U.S.EPA [and the State] where the agency supplied a “reasoned explanation”.

Also, the USEPA is currently in the process of developing effluent guidelines for the construction and development industry, which will include controls for new development and significant redevelopment.⁷

⁵ USGS (1998). *Research reveals link between development and contamination in urban watersheds*. USGS news release. USGS National Water-Quality Assessment Program.

⁶ USGS (2000). *Water Quality in the Long Island-New Jersey Coastal Drainages, New York and New Jersey, 1996-98*. USGS Circular 1201.

⁷ See, Fact Sheet: Effluent Guidelines for the Construction and Development Industry, USEPA, 1999, 3 pp.

Retail Gasoline Outlets

RGOs can range in size from about 3,000 square feet to more than 200,000 square feet. The median size of new RGOs in Los Angeles County is about 13,000 square feet.⁸ There are about 2,133 RGOs in Los Angeles County servicing a population of 9.5 million, and nearly six million registered motor vehicles.⁹ In San Diego County there are about 700 RGOs serving a population of 2.8 million, and nearly 2 million registered vehicles.

RGOs are points of confluence for motor vehicles for automotive related services such as repair, refueling, and ancillary services such as tire air inflation and radiator fillup. The vehicular traffic patterns at RGOs are similar to those on parking lots and on highways. Researchers have identified RGOs as toxic pollutant hotspots.¹⁰

Storm Water Quality

RGOs are a well identified source of urban storm water pollutants that impair receiving waters. WSPA has acknowledged that storm water discharges from even “normally operated and maintained” RGOs are no worse than discharges from commercial parking lots and diffuse urban runoff.¹¹ The reason that “normally operated and maintained” RGOs do not demonstrate any improvement in storm water discharge quality is because existing BMPs do not address pollutants generated by motor-vehicle traffic.¹² Heavy metals, significant concentrations of which occur in storm water discharges from RGOs, have been demonstrated to be the main cause of toxicity in Santa Monica Bay during wet weather.¹³ Oil and grease in the storm water discharges from RGOs are also of concern.¹⁴

In a study conducted in Maryland, RGOs were identified to generate significantly higher concentrations of hydrocarbon and heavy metals than parking lots, convenience store lots, and

⁸ Data Base Summary Report, New Gas Station Permits issued between Jan 1, 1999 and Dec 31, 2000, City of Los Angeles, Department of Building and Safety (2001)

⁹ California Energy Commission, Fuels Office, 1999.

¹⁰ Schueler, T. and D. Shepp (1992). *The Quality of Trapped Sediments and Poor Water within Oil Grit Separators in Suburban MD*. Metropolitan Washington Council of Governments.

¹¹ See, Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study, Western States Petroleum Association and American Petroleum Institute (1994) at p 13. The study concludes that pollutant concentrations in storm water discharges from RGOs are similar to concentrations from commercial parking lots and diffuse urban runoff. See also June 7 State Board Hearing Transcript at p 231; comment by WSPA witness, that “concentrations of metals, hydrocarbons, and solids were no higher than.... roads and parking lots”.

¹² See June 8 State Board Hearing Transcript at p 136, Regional Board staff testimony that current BMPs at RGOs do not address pollution associated with vehicular traffic.

¹³ See “Study of the Impact of Storm Water Discharge on Santa Monica Bay – Executive Summary”, Los Angeles County Department of Public Works (1999), which identifies Zn and Cu as principal pollutants that cause storm water toxicity.

¹⁴ Rouge River National Wet Weather Demonstration Project, MI, - Evaluation of On-line Media Filters in the Rouge River Watershed, Report No. RPO-NPS-TPM59.00 (1999), 36 pp.

streets.¹⁵ A study conducted in Sacramento County, California, identified heavy metals such as lead, copper, and zinc, as significant in storm water from RGOs.¹⁶ Volatile organic compounds (VOCs) such as benzene, toluene, ethylbenzene, and xylene are rarely detected in storm water because of their volatility. In contrast, gasoline and other solvents, because of their physical and chemical characteristics, may present a significant risk for groundwater contamination, if underground and aboveground storage tanks leak.

The sources of storm water pollutants at RGO are from tail-pipe exhaust particles, fluid losses, drips, spills, and mechanical, brakepad and tire wear products, which build up on impervious surfaces at RGOs.¹⁷ The pollutants of most concern in storm water are heavy metals such as Pb, Cu, and Zn and petroleum hydrocarbons such as PAHs.¹⁸ The concentration and loads of these pollutants in storm water runoff from RGOs depends on the surface deposition and removal rates, and permanent storage. The permanent storage on surfaces is a function of surface area texture and condition and is literally trapped in the texture or cracks of the surface area. Pollutants are deposited any where vehicles travel, park, or are serviced, including RGOs.¹⁹

Review of New Development Design Standards

WSPA represents petroleum industry members in the States of Arizona, Hawaii, Nevada, Oregon, in addition to California. WSPA in its Petitions before the State Board has contended that new development standards that include numerical design standards for BMPs are impracticable and unnecessary at RGOs, and so we focussed the review on development standards that new RGOs are subject to in Western U.S. States. We are aware that new RGO developments in other States such as Maryland, Virginia, Florida, Alabama, Tennessee, Georgia, Oklahoma and Texas, are also subject to numerical mitigation requirements for storm water pollutants, but we did not review their programs for this technical report.

In Washington, RGOs in the western region that create impervious surfaces of 5,000 square feet or more are required to mitigate the 6 month 24 hour storm (about 1.2 inches of rainfall). In addition to the standard treatment menu based on a water quality design storm,

¹⁵ *Hydrocarbon Hotspots in the Urban Landscape*, Shueler T., and Shepp, D., (1995), pp. 259-264, *National Conference on Urban Runoff Management: Enhancing Urban Watershed Management at the Local, County and State Levels*, Chicago, IL, Report No. EPA/625/R-95/003. A survey of oil and grit separators in suburban Maryland indicated that RGOs and convenience stores had much higher levels of hydrocarbons and metals both in the water column and the sediments.

¹⁶ *Action Plan Demonstration Project (APDP) - Demonstration of Gasoline Fueling Station Best Management Practices*, County of Sacramento, (1994), pp. 30 Submitted to US EPA Region IX, San Francisco Estuary Project.. This study funded by the USEPA and conducted by Sacramento County identified heavy metals such as lead, copper, and zinc in significant concentrations in storm water runoff from RGOs. Volatile Organic Compounds (VOCs) from fueling areas were rarely detected because of their volatility. Data on Polycyclic Aromatic Hydrocarbons (PAHs) was inconclusive because analytical detection limits used were higher than regulatory action levels.

¹⁷ Shaheen, D.G. (1975). *Contributions of Urban Roadway Usage to Water Pollution*. 600/2-75-004. U.S. Environmental Protection Agency. Washington, DC.

¹⁸ Field, Richard, James P. Heaney and Robert Pitt. (2000). *Innovative Urban Wet-Weather Flow Management Systems*. Technomic Publishing Co., Inc. Lancaster.

¹⁹ County of Sacramento, (1994). *Action Plan Demonstration Project (APDP) - Demonstration of Gasoline Fueling Station Best Management Practices*. Submitted to US EPA Region IX, San Francisco Estuary Project.

RGOs that are expected to generate ADT of 100 vehicles or more per 1,000 square feet of gross building area are required separately to treat to remove oil.²⁰ The City of Portland in Oregon under its MS4 program requires RGOs to mitigate storm water runoff from impervious areas equal to or greater than 500 square feet using any one of three different design approaches.²¹ One of the choices is the 24-hour rainfall event standard (0.83 inch of rainfall). In addition, RGOs that are expected to generate 100 vehicles or more ADT per 1000 square feet of gross building area are subject to separate treatment controls for oil using a water quality design standard of a two year 24 hour storm.²² In both Washington and Oregon, storm water treatment is required in addition to the source control BMPs identified by WSPA for implementation at its facilities in California.²³

Treatment Control BMPs

The U.S. EPA funded a demonstration project to evaluate the effectiveness of on-line media filter media to treat pollutants from storm discharges at RGOs.²⁴ Four on-line media filter systems were tested and the study concluded that the treatment systems had sufficient ability to remove pollutants without risk of flooding, were easy to operate and maintain, and reasonable in capital cost.

We also reviewed storm water quality data results evaluating the pollutant removal effectiveness of a proprietary on-line filter media device located at a large RGO in Washington.²⁵ The device was installed underground and thus occupied no surface area. The treatment device was effective in removing between 50 and 90 percent of pollutants of concern in storm water discharges from RGOs. We note with interest that in perusing the treatment devices installation list of this proprietary manufacturer between 1997 and 2001 in the Western U.S., California had not a single installation at an RGO but Oregon and Washington had a combined total of 13 RGO sites where the treatment devices were installed. Considering that RGOs in the State of Washington and Oregon have ADT that is much less than in California, the aberration can only be explained by the lack of rigorous storm water regulatory controls in California to control the discharge of pollutants in storm water discharges from RGOs.²⁶

Our review indicates that effective treatment devices for RGOs include on-line media filter systems with a combination of media placed in series to remove the pollutants of concern.

²⁰ Such sites are considered “high use sites” because they typically generate high concentrations of oil from traffic turnover. See Stormwater Management Manual for Western Washington, Vol. V, Runoff Treatment BMPs, (2000), Washington Department of Ecology, p 145.

²¹ Stormwater Management Manual, City of Portland, OR, (2000), p 1-11.

²² Ibid. at page 9-47. Sites that meet the threshold are considered “higher risk categories”.

²³ Cf. BMP Guide for Retail Gasoline Outlets, CA Storm Water Quality Task Force, and WSPA (1997); Storm Water Manual for Western Washington Vol. IV and V, Washington Dept. Ecology (2000).

²⁴ See, Rouge River National Wet Weather Demonstration Project, MI, - Evaluation of On-line Media Filters in the Rouge River Watershed, Report No. RPO-NPS-TPM59.00 (1999), 36 pp.

²⁵ See, Stormwater Sampling – StormFilter Performance Results: Burwell-Straley’s Union 76 Station, Bremerton, WA (2000). 7 pp.

²⁶ Report, Database Summary List of Treatment Devices installed between 1997 and 2001, Provided by StormFilter, OR.

Sand filters are another option. There may be other treatment control BMPs that may be equally if not more effective.²⁷

Economic Considerations

A review of costs of storm water treatment controls for RGOs indicates that the cost of storm water treatment is reasonable.²⁸ In addition, a demonstration project sponsored by the USEPA to evaluate the effectiveness and costs of on-line media filters placed the first year capital cost between \$250 and \$900 and an operations and maintenance cost of \$240 annually.²⁹

Justification

The State Board in its SUSMP Decision temporarily excluded RGOs from the numerical mitigation standard until Regional Boards provided proper justification and established appropriate thresholds. Issues to be considered included presumptions that RGOs were, (i) already heavily regulated; (ii) limited in their ability to construct infiltration BMPs; (iii) generally small in size; and (iv) storm water treatment may not be feasible or safe.

Over-regulation:³⁰ Under State law, the State Board and Regional Boards are the primary authorities for implementation of the federal Clean Water Act, and for matters related to water quality within the State.³¹ There is no basis in federal or State statute that permits the State Board or Regional Boards to abdicate their water quality authority because discharges from facilities that impact water quality are already regulated for other purposes. Attainment and maintenance of receiving water objectives and the protection of beneficial uses are the paramount considerations.

Limitations of space or ability: Our review indicates that RGOs appear not to be limited by space or ability to treat storm water. The surface area of RGO developments is generally greater

²⁷ For a list of potential treatment options see, Storm Water Manual for Western Washington Vol. V, - Runoff Treatment BMPs, Washington Dept. Ecology (2000).

²⁸ See "Cost and Benefits of Storm Water BMPs", Preliminary Data Summary of Urban Storm Water Best Management Practices, USEPA, (1999) Report No. EPA-821-R-99-0012, pp. 6-1 – 6-44.

²⁹ Rouge River National Wet Weather Demonstration Project, MI, - Evaluation of On-line Media Filters in the Rouge River Watershed, Report No. RPO-NPS-TPM59.00 (1999), at p 15-18.

³⁰ The Regional Board's review of regulations that affect RGOs identified, (i) business license for business operation, (ii) Fire Department for tank/ piping integrity and gasoline storage; (iii) County Public Works for underground storage of hazardous chemicals; (iv) Air Quality Management District for VOC emissions; (v) Sanitation District for any sanitary sewer discharges; (vi) County Weights and Measures for sale of gasoline; (vi) Department of Toxics Substance Control for waste motor oil disposal; (vii) County Health for food and beverage sale; and (viii) Regional Board for regulation of leaking tanks to protect groundwater.

³¹ Cal. Wat. Code § 13160 states that, "the State Board is designated as the state water pollution control authority for all purposes.... in federal act." Cal. Pub. Res. Code § 30412 states that, "other State agencies shall not modify, adopt conditions, or take any action in conflict with any determination by the State Board in matters relating to water quality".

than 5000 square feet. The fabricated storm water treatment systems we reviewed generally do not exceed 128 square feet in surface area when installed and do not impede traffic flow because they are situated sub-surface. While opportunities for infiltration practices may be limited, it is but one type of option for mitigation of pollutants in storm water. The SUSMP does not mandate infiltration BMPs. Other treatment options exist such as fabricated treatment control BMPs to remove storm water runoff pollutants using physical, biological, or chemical processes. Also treatment control BMPs can be installed sub-surface without interfering with surface use. RGOs situated in other Western U.S. States, which have lower impervious surface area and higher water quality treatment volume criteria thresholds already implement storm water treatment controls at new facilities.

Feasibility of storm water treatment: Our review of implementation of storm water treatment control requirements in other Western U.S. States indicates that storm water treatment at RGOs is both feasible and safe. In California, sub-surface fabricated treatment systems have been commonly used at RGOs to separate waste-oil before discharge to the sanitary sewer system. Safety or feasibility has not been an issue when sanitation districts required RGOs to install treatment systems in order to obtain connection permits to the sanitary sewer system. As previously mentioned storm water treatment controls are installed as a matter of practice by RGOs in other Western U.S. States. There is no reason to suppose that storm water treatment in California introduces new and different safety and feasibility considerations, as when compared to wastewater treatment systems which RGOs have readily installed in California and storm water treatment systems installed in other Western U.S. States.

Suggested criteria

Storm water pollution at RGOs is primarily a function of the number of motor vehicles that are refueled or serviced. Ancillary services such as auto repair may additionally contribute significant pollutant loads. A WSPA study concluded that the storm water runoff quality from well-maintained RGOs is comparable in pollutant concentrations to runoff from commercial parking lots.³²

The State Board recommended that the Regional Boards undertake further consideration of a threshold relative to size of RGOs for application of the numerical design standard for storm water. Our analysis indicated the following criteria for thresholds may be appropriate.

Land area: 5,000 square feet or more of impervious area. RGOs in Portland, Oregon and Western Washington that meet this land area threshold are currently subject to storm water treatment requirements based on the water quality design storm.³³

Projected Average Daily Traffic (ADT): 100 or more vehicles fueled per day. The projection for the number of vehicle trips a RGO can expect may be estimated using information published by the Institute of Transportation Engineers. The vehicular traffic at an RGO is a good determinant for the quantity of storm water pollutants generated at the site. RGOs in Oregon and Washington are subject to two tiers of threshold for treatment of storm water, the first based

³² See 'Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study (1994)', Western States Petroleum Association, and American Petroleum Institute, 49 p. Commercial parking lots 5,000 square feet or more are presently subject to the SUSMP numerical mitigation standard.

³³ WSPA represents companies that explore, produce, refine, transport and market petroleum in six western states including Oregon, Washington, and California. See www.wspa.org

on the impervious area threshold, and an additional tier storm water treatment requirement for sites that expect 100 vehicles or more ADT per 1,000 square feet of gross building area.³⁴

Projected volume of gasoline sale: 25,000 gallons or more of gasoline sale per month.³⁵
The projected volume of gasoline sales is directly correlated with vehicular trips. 25,000 gallons of gasoline sale per month is equivalent to an average daily traffic of about 100 vehicles.³⁶

Although other criteria such as the number of fueling dispensers (“nozzles”-4 or more) and the number of dispenser meters (12 or more assuming one meter per octane grade), were considered for thresholds, the relationship of such criteria to predict the potential for pollutant generation at RGOs is less direct.

It is recommended that numerical mitigation standards be made applicable, if the RGO development meets the following thresholds, (i) creates 5,000 square feet or more of impervious surface; and (ii) has a projected trip generation of 100 or more motor vehicles ADT.

Conclusion

RGOs have been well documented in the scientific literature as significant sources of storm water pollutants. These pollutants such as heavy metals and PAHs have been known to cause the impairment of beneficial uses in receiving waters. As a source of pollutants, storm water from RGOs is similar to runoff from driveways, roads, highways and parking lots.

In order to reduce the discharge of pollutants in storm water to the MS4, it is technically appropriate to require that new RGOs and significantly redeveloped RGOs be subject to the SUSMP numerical mitigation criteria. RGOs in other Western U.S. States already comply with higher numerical mitigation standards than those established by the LA Regional Board and the SD Regional Board. The treatment of storm water for RGOs is technically feasible, safe, and of reasonable cost.

³⁴ See, Storm Water Management Manual (August 2000), City of Portland, Oregon, (p 9-10) additional thresholds for fuel dispensing facilities. Also, Storm Water Management Manual for Western Washington, Vol. V, Runoff Treatment BMPs, Washington Department of Ecology, p 9-10, additional requirement thresholds for high-use sites.

³⁵ The average volume of gasoline sales at a RGO in California is approximately 100,000 gallons per month. Gasoline stations with outputs of 200,000 or more gallons a month are considered high output facilities by the industry.

³⁶ A typical “full” tank gas refueling is around 8 gallons delivered at a pump. Many RGOs use this benchmark for discount offerings or other type of incentives associated with refueling. 100 cars x 8 gallons per car x 30 days = 24,000 gallons of gasoline per month.

Table 1. Characterization of Pollutant Concentrations in the OGS Water Column: Effect of Land-Use Condition (Mean Values)³⁷

<u>Sampled Parameter</u>	All-Day Parking (N = 8)	Convenience Commercial (N = 6)	Gas Stations (N = 7)	Streets (N = 6)	Townhouse/ Garden Apartments (N = 6)
OP (mg/L)	0.23	0.16	0.11	ND	0.11
TP (mg/L)	0.30	0.50	0.53	0.06	0.19
NH3-N (mg/L)	0.20	1.58	0.11	0.19	0.20
TKN (mg/L)	1.18	4.94	2.5	0.84	1.00
OX-N (mg/L)	0.65	0.01	0.21	0.92	0.17
TOC (mg/L)	20.60	26.80	95.51	9.91	15.75
Hydrocarbons (mg/L)	15.40	10.93	21.97	2.86	2.38
TSS (mg/L)	4.74	5.70	--	9.60	7.07
ECd (µg/L)	6.45	7.92 ^a	15.29^a	ND	ND
SCd (µg/L)	3.40 ^a	ND	6.34 ^a	ND	10.34 ^a
ECr (µg/L)	5.37	13.85	17.63^a	5.52 ^a	ND
SCr (µg/L)	ND	ND	6.40 ^a	ND	4.79 ^a
ECu (µg/L)	11.61	22.11	112.63	9.50 ^a	3.62
SCu (µg/L)	8.22 ^a	ND	25.64	ND	2.40
EPb (µg/L)	13.42	28.87	162.38	8.23	ND
SPb (µg/L)	8.10 ^a	ND	26.90 ^a	ND	ND
EZn (µg/L)	190.00	201.00	554.00	92.00	NA
SZn (µg/L)	106.70	43.70	471.00	69.00	59.00

^aMean is for all observations in which the ND = not detected; NA = not applicable.
 Hydrocarbons = total hydrocarbons
 TSS = total suspended solids
 ECd = extractable cadmium
 indicated parameter was actually detected.

OP = ortho phosphate phosphorus
 TP = total phosphorus
 NH3-N = ammonia nitrogen
 TKN = total Kjeldahl nitrogen
 OX-N = oxidized nitrogen
 TOC = total organic carbon
 SCd = soluble cadmium
 ECr = extractable chromium
 SCr = soluble chromium
 ECu = extractable copper
 SCu = soluble copper
 EPb = extractable lead
 SPb = soluble lead
 EZn = extractable zinc
 SZn = soluble zinc

³⁷ *Hydrocarbon Hotspots in the Urban Landscape*, Shueler T., and Shepp, D., (1995), pp. 259-264, National Conference on Urban Runoff Management: Enhancing Urban Watershed Management at the Local, County and State Levels, Chicago, IL, Report No. EPA/625/R-95/003.

Table 2. Data Comparison – RGO Studies

Constituent (ug/l)	Study 1 ³⁸	Study 2 ³⁹	Study 3 ⁴⁰	Effluent Criteria ^{41,42} (ug/l)	
Aluminum	829	ND	ND	750	--
Cadmium	0.7	ND	15.29	15.9	4.3
Chromium	4.2	ND	17.63	--	16 ⁴³
Copper	25.2	200	112.63	63.6	13
Lead	33.4	ND	162.38	81.6	65
Nickel	4.7	ND	ND	1417	470
Zinc	379	200 to 600#	554	117	120
Oil & Grease (mg/l)	4.6	1 to 34	95.5⁴⁴	15	--
TSS (mg/l)	59	10 to ?	ND	100	--

= range; ND = No Data;

³⁸ *Demonstration of Gasoline Fueling Station Best Management Practices* - Uribe & Associates, Larry Walker Associates - Final Report - October 1994

³⁹ *Retail Gasoline Outlet Storm Water Runoff Study* - Western States Petroleum Association (WSPA), Draft Report, prepared by Hart-Crowser 1993

⁴⁰ *Hydrocarbon Hotspots in the Urban Landscape* - Schueler T. and Shepp D., Metropolitan Washington Council of Governments - Washington DC in Seminar Publication National Conference on Urban Runoff Management: Enhancing Urban Watershed Management at the Local, County, and State Levels - Chicago 1993 [EPA/625/R-95/003]

⁴¹ *Parameter Benchmark Values* - Final Reissuance of National Pollutant Discharge Elimination System Storm Water Multi-Sector General Permit for Industrial Activities; Notice - Federal Register/ Vol. 65, No 210/ October 30, 2000. 64767

⁴² *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule - 40* CFR Part 131 Federal Register/ Vol. 65, No 97/ May 18, 2000 pag. 31682 et. Seq.

⁴³ Chromium (VI)

⁴⁴ TOC

ATTACHMENT 56

ANNUAL MONITORING REPORT 2001-2002

**Stormwater Monitoring Coalition
Of Southern California**

October 25, 2002

INTRODUCTION

Stormwater runoff in southern California has become one of the largest environmental management issues in the region. While current runoff management has become an immensely successful system for flood control, it has not historically been designed to enhance water quality. Current estimates of pollutant loads from stormwater runoff rival those of traditional point sources for many constituents, and several examples of impacts from storm drains and channels have been observed in receiving waters. Examples include the contribution of bacteria that has resulted in posting of beaches for swimming, contributions of nutrients that have resulted in blooms of macroalgae, and contributions of toxics that has led to aquatic toxicity and degradation of aquatic habitats. This combination of emissions and impacts has led to an increasing regulatory focus on stormwater runoff, but much of the science needed to make effective and efficient management decisions is still lacking.

As a result of the increasing regulatory focus and the lack of scientific knowledge base, both stormwater regulators and municipal stormwater management agencies throughout southern California have developed a collaborative working relationship. The goal of this relationship is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop the tools that will effectively and efficiently improve stormwater decision-making. As individuals and agency representatives, there was early recognition that these issues are oftentimes not localized, but typically cross watershed and jurisdictional boundaries. This relationship culminated in a formal letter of agreement signed by all of the Phase I municipal stormwater NPDES lead permittees and the NPDES regulatory agencies in southern California to create the Stormwater Monitoring Coalition (SMC) (Table 1).

The SMC member agencies have developed a clear vision of regional cooperation. The vision includes combining resources to cost effectively achieve their goal. The vision includes improved effectiveness of existing monitoring programs by promoting standardization, coordination, and reducing duplication of effort across individual programs. This will lead to improving the basic infrastructure for exchanging, combining, and analyzing data from across the region. The multi-agency collaboration hopes to trade off redundant or ineffective monitoring program elements in order to allocate resources to the research projects necessary for improving stormwater management. The findings from these applied research projects can then be easily and quickly integrated into the existing stormwater management programs.

This document outlines the activities that the SMC has accomplished over the last year. The initial project promoted by the SMC was the creation of a research agenda. The SMC has subsequently embraced three of the proposed projects in the research agenda and have begun work to accomplish the project objectives. The SMC meets on a quarterly basis to discuss these projects and ensure their success. Cumulatively, these activities demonstrate that the SMC is an active organization and is making great strides in achieving its stated goals. The common vision shared in by the initial founding members

of the SMC has taken root and is being implemented to the benefit of both regulatory and regulated communities.

Table 1. List of member agencies in the Stormwater Monitoring Coalition.

California Regional Water Quality Control Board, Los Angeles Region
California Regional Water Quality Control Board, San Diego Region
California Regional Water Quality Control Board, Santa Ana Region
City of Long Beach
County of Orange, Public Facilities and Resources Dept.
County of San Diego Stormwater Management Program
Los Angeles County Department of Public Works
Riverside County Flood Control and Water Conservation District
San Bernardino County Flood Control District
Southern California Coastal Water Research Project
Ventura County Flood Control District

YEAR END PROJECT STATUS

Creation of a Stormwater Research Agenda (status: complete)

The first project undertaken by the SMC was to develop a research agenda they could jointly undertake. Creation of this research agenda required careful consideration since this document would form the basis of future activities by the SMC. Therefore, the SMC assembled a panel of 16 experts, in a variety of disciplines, for a 3-day facilitated workshop. These experts included hydrologists, civil engineers, water quality scientists, biologists, toxicologists, statisticians, modelers as well as representatives from the regulatory, regulated and environmental community. The goal of the workshop was to create a list of priority project descriptions including background and objectives, general approach, expected products, as well as a timeline and estimated budget. This project was jointly funded by all SMC sponsoring agencies.

The final research agenda was comprised of 15 distinct projects. The 15 projects fell into a three-part framework that included building a monitoring infrastructure, understanding stormwater mechanisms and processes, and understanding receiving water impacts. Building monitoring infrastructure included projects such as developing standardized sampling and analysis protocols, assessing BMP effectiveness, and examining historical monitoring data. Understanding stormwater mechanisms and processes included projects such as developing a systemwide conceptual model, identifying non-point sources that contribute to stormwater, and determining appropriate reference conditions. Understanding receiving water impacts included projects such as developing bioassessment indicators and protocols, developing microbial source tracking techniques, and evaluating indicators of peak flow impacts. The final report entitled "Stormwater

Research Needs in Southern California” can be found online at ftp://ftp.sccwrp.org/pub/download/PDFs/358_stormwater_workplan.pdf

Develop standardized sampling and analysis protocols (Status: initiated and ongoing)

This project is an attempt to build a stormwater monitoring infrastructure in order to increase comparability among programs throughout southern California. The SMC developed a four-step approach to accomplish this goal: (1) define the monitoring questions of interest, (2) assess what monitoring programs are currently doing to determine how well they are answering the monitoring questions, (3) create an optimum design for answering the monitoring questions, and (4) conduct QA intercalibration studies. This study is partially funded by the State Water Resources Control Board (SWRCB) in response to SB 72, whose legislative goal was to standardize sampling, analysis and reporting for stormwater monitoring. It has been made clear that the SMC is only developing a design for the southern California region.

There has been substantial progress thus far. A technical working group has been formed to guide the study and includes the stormwater agencies and regulators on the SMC, the SWRCB, and at least one environmental group. The group has had one meeting and has begun defining the monitoring questions of interest (step 1). The SMC is currently recruiting a facilitator to continue this process. A laboratory intercalibration is in its initial stages will be completed in the upcoming year.

Microbial Source Tracking Method Comparison (status: initiated and ongoing)

There are numerous waterbodies throughout southern California, both marine and freshwater, that suffer contamination of fecal indicator bacteria such as total coliforms, fecal coliforms, and *enterococcus*. There are several Microbial Source Tracking (MST) techniques now being developed for determining sources (i.e. humans, dogs, cats, horses, etc.) of fecal indicator bacteria in receiving waters. However, all of them are in the early stages of development and none have been tested side-by-side for their ability to accurately discriminate or quantify these sources of fecal contamination. This study was designed to evaluate each of these new methods for accuracy and precision, using bacterial sources from southern California, and then make recommendations to the management community on the most effective and efficient method application(s). The SMC is partially funding this study in collaboration with the US Environmental Protection Agency, State Water Resources Control Board, City of Santa Barbara, and the National Water Research Institute.

Twenty-one of the most prominent researchers in the field are testing nine different MST techniques all at the same time on the same split samples. These techniques include techniques such as ribotyping, antibiotic resistance (ARA), pulsed-field gel

electrophoresis (PFGE), polymerase chain reaction (PCR), and terminal restriction fragment length polymorphism (TRFLP). Each of the specific sources were collected in October and shipped to the researchers for characterization. Next, each sample was added to sterile freshwater or seawater in varying mixtures and densities, then were delivered blind to each laboratory. Each researcher will be asked three questions regarding the blind samples: 1) are human or non-human sources of indicator bacteria are present? 2) if non-human sources are present, what source are they (i.e., dog, cow, seagull)? and 3) what fraction of the sample is attributable to each source? Sample analysis is currently underway and results are expected by February 2003.

Peak Flow Impacts (status: initiated)

Watershed development increases imperviousness eventually leading to alterations in runoff flow regimes. This alteration in flow regime, particularly increased flows during high frequency events (i.e. 1-2 year storms), can result in downstream impacts such as increased erosion or habitat loss. The goal of this study is to quantify impacts from increased peak flows as a result of watershed development. Ultimately, the objective of this study is to develop indicators of peak flow and resulting peak flow impacts so that regulators and regulated agencies can develop numerical criteria for peak flow. This project is fully funded by the Los Angeles County Department of Public Works (LACDPW), although all of the SMC members are interested in this study.

This project is in its initial stages. A Request for Proposals (RFP) was released, written proposals were submitted, and short-listed bidders have had an oral interview. The SMC selection committee is in the process of selecting the winning bidder.

ATTACHMENT 57

ANNUAL REPORT 2008-2009

**Stormwater Monitoring Coalition
Of Southern California**

October 5, 2009

INTRODUCTION

As a result of the increasing regulatory focus and the lack of scientific knowledge base, both stormwater regulators and municipal stormwater management agencies throughout southern California have developed a collaborative working relationship. The goal of this relationship is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop the tools that will effectively and efficiently improve stormwater decision-making. As individuals and agency representatives, there was early recognition that these issues are oftentimes not localized, but typically cross watershed and jurisdictional boundaries. This relationship culminated in a formal letter of agreement, signed in 2000, by all of the Phase I municipal stormwater NPDES lead permittees and the NPDES regulatory agencies in southern California to create the Stormwater Monitoring Coalition (SMC) (Table 1).

Table 1. List of member agencies in the Stormwater Monitoring Coalition.

California Regional Water Quality Control Board, Los Angeles Region
 California Regional Water Quality Control Board, San Diego Region
 California Regional Water Quality Control Board, Santa Ana Region
 California Department of Transportation, Caltrans
 City of Long Beach
 City of Los Angeles, Watershed Protection Division
 County of Orange, Public Facilities and Resources Dept.
 County of San Diego Stormwater Management Program
 Los Angeles County Department of Public Works
 Riverside County Flood Control and Water Conservation District
 San Bernardino County Flood Control District
 Southern California Coastal Water Research Project
 State Water Resources Control Board
 US Environmental Protection Agency, Office of Research and Development
 Ventura County Watershed Protection District

The first project supported by the SMC was to develop a five-year Research Agenda. The research agenda, published in 2001, consisted of 15 unique projects that the SMC ranked, prioritized, and then funded on a voluntary basis. The SMC has made tremendous progress implementing the Research Agenda. Ten of the 15 projects have been started and virtually all have been completed.

The value of the SMC to its member agencies is at least four-fold. The first is the ability to share costs for implementing projects. Cost reductions for SMC member agencies can be significant since collaborative projects can reduce costs by more than 90% relative to footing the bill alone. In addition, the majority of projects have nonmember agency cost-matching. Just for the projects described in this report, there has been nearly one million dollars in grant awards, cost-match, or in-kind services. The second value to member agencies is the ability to stretch their agency's skill base. Stormwater management requires a wide variety of knowledge including regulatory policy, engineering, hydrology, biology, chemistry, toxicity, and microbiology, to name a few. Many member

agencies have limited staff and, by working together, garner the additional skills that are not sustainable within each agency. A third asset of membership is the ability to communicate. Discussions among member agencies provide context and a richness of ideas for application to local issues back home. Similarly, discussion between regulatory and regulated agencies in an informal setting leads to more effective implementation of management activities. Finally, projects conducted under the SMC umbrella have nearly always resulted in some management action. Often, it is difficult for a single agency to affect the current course of regulatory management. Because SMC projects are initiated and vetted through all of the regulated and regulatory management agencies, the results are adopted quickly into the management framework including alterations to NPDES permits.

The SMC has been expanding its role beyond just technical projects by emphasizing outreach and communication. This has occurred through three main venues. The first venue is the establishment of an SMC web site [www.socalsmc.org]. The goal of this web site is to showcase the SMC, but to also provide an outlet for each of the products developed by the agency. The second venue is through the development of project specific Technical Advisory Committees and Working Groups. These Committees are valuable for involving outside experts, but also for including technical staff of the individual agencies. The third venue for outreach is through training and workshops. These have initiated as a result of project specific needs such as LID technology for City Planners or the Hydromodification Workshop associated with CASQA Annual Meetings.

The SMC research should be dynamic and is responding to new issues as they arise. For example, the SMC has reacted to important issues such as evolving Low Impact Development technology, new hydromodification permit requirements, and response to catastrophic events such as wildfires.

PROJECT ACCOMPLISHMENTS

Post-fire monitoring plan

Status: Complete

Estimated Budget: \$75,000

Periodic wildfires are a natural component of southern California's forest and scrubland and essential to maintaining overall ecological health of these systems. However, the frequency and intensity of wildfires has increased in association with human activities in and near natural forest and foothill areas. The effects of fire on hydrologic response and sediment loads in southern California have been noted for over 80 years, yet no coordinated monitoring of water quality following fires currently occurs. The lack of coordinated monitoring is particularly problematic in southern California because watersheds affected by fire often drain to waterbodies that support sensitive resources or that have been designated as impaired under Section 303(d) of the Clean Water Act, often for the same constituents found in post-fire runoff. Consequently, the contribution of

metals, nutrients, and organic contaminants from post-fire runoff to receiving waters is poorly understood in terms of both the magnitude and persistence of potential effects.

The lack of a coordinated post-fire monitoring program results from several factors. First, there is no procedure for post-fire water quality monitoring that identifies a standard set of constituents and monitoring protocols appropriate for assessing water quality following fires. Second, resources are often scarce following fires making it difficult for various entities to coordinate. Third, there is no regional entity responsible for coordinating post-fire sampling, compiling the resultant data, and disseminating the information back to managers at the local and regional levels. Fourth, because fires occur unexpectedly, there is often insufficient available funding for conducting post-fire sampling. This document describes a regional post-fire water quality monitoring program. The goal of the program is to help address the current information gaps by providing agreed upon regional post-fire water quality sampling procedures, including an implementation plan and a funding strategy. This plan was developed by a team of technical experts, stormwater managers, and regulators from academia, government, and the private sector. The plan provides a ready “off-the-shelf” response plan that can be quickly implemented after fires.

The post-fire monitoring program is organized around three priority management questions:

1. How does post-fire runoff affect contaminant flux?
2. What is the effect of post-fire runoff on downstream receiving waters?
3. What are the factors that influence how long post-fire runoff effects persist?

Although they are related, monitoring to address each of the questions is not interdependent. The three major monitoring elements are separable and can be implemented as distinct units or as an integrated program.

A Conceptual Workplan was generated from the workshop participants entitled “Effects of post-fire runoff on surface water quality: Development of a southern California regional monitoring program with management questions and implementation recommendations”

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/598_SoCalRegionalFireMonitoringPlan.pdf.

The regional plan captures sampling design, site selection process, sampling approach, and recommended indicators for each of the monitoring questions. The regional plan includes site selection criteria that allow for pre-selection and prioritization of potential sampling sites based on the sensitivity of potentially affected resources, presence of previous and available monitoring data, feasibility, accessibility, and ability to coordinate with other monitoring programs. Pre-selection of sites and up-front coordination will allow for more rapid and effective response following fires. Finally, the plan includes preliminary recommendations for quality assurance procedures, data management, and communication that will facilitate information sharing and ongoing coordination.

Ongoing program development and coordination will be accomplished through a post-fire runoff working group that consists of the U.S. Forest Service, U.S. Geological Survey,

CAL FIRE, the regional water quality control boards, major municipalities, key landowners, and local researchers. The working group is currently investigating monitoring sites for the Morris, Station and Cottonwood fires.

Stormwater Data Compilation Study

Status: 90% complete

Project Budget: \$75,000 (Resources provided by SCCWRP)

Assessment and prioritization for mitigating water quality requires context. Knowledge of mean concentrations across watersheds, counties, and regulatory jurisdictions provides the perspective needed for managers to rank waterbodies for management action. Regional reference condition, frequency of water quality objective exceedences, extent and distribution of parameter concentrations all play a part in determining where a manager's worst problem occur.

To help managers gain the necessary perspective, the SMC described a project in their Research Agenda that compiles water quality monitoring information regionwide. For several years, the SMC has been building the necessary infrastructure to support such an effort. Data sharing protocols, interlaboratory calibrations, and web-enabled interfaces all enhance the SMC's ability to share data. The goal of this project is to compile the existing water quality monitoring information. Initially starting with nutrients, the objective will be to make annual estimates of concentrations and mass emissions from xx watersheds between Ventura and San Diego.

Remarkable progress was made this year. More than 500,000 data records were compiled among all SMC agencies. Initial assessments indicated that there was tremendous variation and completeness among the data submittals. However, the greatest hindrance towards achieving our goal was not the lack of concentration data, but the lack of flow data. Ultimately, this impacted the ability to estimate annual loads. The data set is currently being augmented with the missing data prior to final load estimates. SCCWRP staff is working with SMC agencies to update data submittal procedures for the 2009-2010 storm season and address remaining issues to improve load estimation.

Implementing A Regionally Consistent and Integrated Freshwater Stream Bioassessment Monitoring Program

Status: 50% complete

Project budget: \$150,000 (\$75,000 contract from the SWRCB)

Assessment of freshwater biological communities represents a potentially powerful tool for evaluating the effects of discharges in southern California creeks and streams. Bioassessments integrate the effects of multiple stressors, including chemical pollutants and physical alterations in receiving waters. The value of biological assessments is that they are closer to many of the defined beneficial uses of receiving waters (i.e. aquatic life, warm water habitat, cold water habitat) than chemically-derived water quality objectives.

As a result, virtually every SMC member agency has biological community monitoring in their respective NPDES permits.

The goal of this study is to implement a coordinated, integrated regional bioassessment monitoring program. Previously, the SMC had worked together to design an optimal monitoring program that satisfied both local needs, but simultaneously provided information that could be combined to make regionwide assessments. Monitoring questions included: 1) What is the extent of impact in streams of southern California? 2) What are the stressors that impact southern California streams? and 3) Is the extent of stream impacts changing over time? Over the last year, over 110 sites were sampled between Ventura and San Diego counties for biological communities, water quality, physical habitat, and riparian condition. Laboratory analysis is currently underway.

While the monitoring information will be extremely useful for assessing cumulative impacts and regional reference condition, a number of useful products have already been achieved. One example is the creation of the Project Quality Assurance Plan (QAPP). To date, the State did not have a QAPP for analysis of biological samples. The SMC working group embraced this challenge and the SWRCB now uses the data quality objectives we established as their standard statewide. Other examples include refined GIS layers of stream networks, staff training for sampling, and field audits to ensure high levels of quality. These milestones translate into not just a high quality regional monitoring program, but rolls over into the ongoing local monitoring programs of each member agency.

Our main collaborator on this project is the California Department of Fish and Game (CDF&G) and SWRCB. The project is 50% funded by the SWRCB, whose main desire is to ensure integration with the Surface Water Ambient Monitoring Program (SWAMP). This will provide further value to SMC member agencies.

Laboratory Intercalibration Study

Status: 90% complete

Project budget: \$17,000 (in-kind services from all participating laboratories)

One goal of the southern California Stormwater Monitoring Coalition (SMC) is to compile monitoring data from separate monitoring programs to make regionwide assessments. For example, the SMC is participating in Regional Monitoring and Regional Data Compilation studies (see previous studies). Both of these studies require not only high quality data, but comparability among laboratories. Despite all SMC laboratories being State-certified, previous intercalibration studies have demonstrated interlaboratory coefficients of variation in excess of 100% for many constituents. As a result, the SMC has endorsed laboratory intercalibration studies based on the types of samples for which they are responsible.

Two laboratory intercalibrations have been conducted by the SMC. The first involved 11 analytical laboratories and focused on suspended solids (TSS), nutrients, and trace metals. The first intercalibration distributed samples to each laboratory blind and in

triplicate, thus assessing both within and between lab variations. Multiple iterations were required for some constituents, but the variability between laboratories was reduced to within laboratory variance ($\leq 20\%$) for most constituents. The end result was a performance-based Guidance Manual that defines the sensitivity, accuracy, and precision necessary for analyzing samples for any SMC member agency
ftp://ftp.secwpr.org/pub/download/PDFs/420_smc_chem.pdf.

The second laboratory intercalibration three years later focused on the same constituents and most of the same laboratories. Interestingly, the range of variability achieved in the previous intercalibration was repeated during the first iteration; a good sign for member agencies indicating that quality assurance was maintained between intercalibrations. A revised Guidance Manual was produced including a scoring system that defined letter grades for intercalibration performance. The SMC began using this laboratory intercalibration as a screening tool for selecting contractors.

The two laboratory Guidance Manual and intercalibration efforts, however, were incomplete in two areas. The first area was the need to repeat the intercalibration periodically as new laboratories, or new personnel at existing laboratories, come along. The second area was the need to intercalibrate on additional constituents. While the original laboratory calibration focused on TSS, nutrients, and trace metals, trace level organic constituents were not included.

The goal of this project is to fill in the missing information to make the Laboratory Guidance Manual an ongoing and effective document. It will involve four steps: 1) recruiting laboratories; 2) repeating the laboratory intercalibration for TSS, nutrients, and trace metals; 3) initiate an intercalibration for organic constituents; and 4) revise and update the Laboratory Guidance Manual. A technical Working Group consisting mostly of laboratory managers has been formed to assist in the study.

The SMC has successfully finished the first three tasks of the study. Fifteen laboratories participated in this intercalibration study; increasing the number of participants by nearly 40%. The intercalibration of TSS, nutrients, and trace metals was based on certified reference materials, a dry weather runoff sample, and a wet weather runoff sample from an urban land use. A longer list of nutrients and metals were added to mimic the list being analyzed for the regional watershed monitoring program. In addition, a number of the constituent reporting limits were lowered to ensure consistency with the SWRCB's ambient monitoring program. The intercalibration for organics focused on over 50 chlorinated hydrocarbons (CHCs; i.e., DDTs, chlordanes, and PCBs) and eight pyrethroid pesticides (i.e., bifenthrin). CHCs were one focus because of the difficulty in confident low level analysis and implication in TMDLs for each of the RWQCB jurisdictions. Pyrethroid pesticides were selected because of its increasingly wide use in the urban landscape by homeowners. To ensure measureable levels of organic analytes, samples were created by distributing unknown calibration standards or by mixing contaminated sediments into a dry weather runoff sample.

Once again, the laboratories performed well including the new laboratories. Minimum levels of comparability were attained after the first iteration for TSS, nutrients, and trace

metals. Laboratories were able to achieve the lowered detection limits and additional analytes. Laboratories were less successful for the organic analytes. Many organic compounds had coefficients of variation exceeding 300%, which is extreme for samples such as standards. However, each of the laboratories has committed to future iterations to ensure quality and comparability for these problematic organic compounds.

The SMC is pursuing a future interlaboratory calibration agreement to maintain the periodicity of the intercalibration, add further organic constituents (i.e., PAHs), and increase the quality and comparability of toxicity measurements.

Hydromodification Study

Status: 50% complete

Project budget: \$1,137,440 (\$1,137,440 State Prop 50 Grant)

The process of urbanization has the potential to affect stream courses by altering watershed hydrology. Development and redevelopment can increase the amount of impervious surfaces on formerly undeveloped landscapes. This reduces the capacity of remaining pervious surfaces to capture and infiltrate rainfall and, as a result, a larger percentage of rainfall becomes runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so peak discharge rates post-development are higher compared to predevelopment for an equivalent rainfall event. This process has been termed hydromodification.

Hydromodification can result in adverse effects to stream habitat, surface water quality, and water supply. The stream erosion that results from the increased peak flow can threaten infrastructure, homes, and businesses. Intermittent and ephemeral streams that possess riparian and wetland habitat are at particular risk from effects of hydromodification. Streams in semi-arid regions are especially vulnerable to urbanization due to a prevalence of sand bed channels, lack of vegetative reinforcement, and relatively large net changes in water and sediment supply associated with stormwater runoff. Recent studies by the SMC have indicated that intermittent and ephemeral streams in southern California degrade at lower levels of watershed urbanization than streams in the eastern US.

In response to the effects of hydromodification, state and local agencies are developing standards and management approaches to control and/or mitigate the effects of hydromodification on natural and semi-natural stream courses. Successful implementation of these regulatory programs requires development of tools to better assess hydromodification effects and develop appropriate mitigation and management strategies.

The goal of this project is to develop a series of tools supporting implementation of hydromodification management measures that could be used to better protect the physical, chemical, and biological integrity of streams and their associated beneficial uses. This project will provide tools to answer the following questions: 1) Which streams

are at the greatest risk from the effects of hydromodification? 2) What are the anticipated effects in terms of increased erosion, sedimentation, or habitat loss, associated with increases in impervious cover? 3) What are some potential management measures that could be implemented to offset hydromodification effects and how effective are they likely to be?

This project is being conducted in collaboration with researchers from Colorado State University, Fort Collins. Several milestones have been reached over the previous year. First we completed a review of mapping and classification literature that will serve as the foundation for the classification system developed by this project

ftp://ftp.sccwrp.org/pub/download/PDFs/562_Hydromod_LitReview.pdf. Second, we completed an extensive field campaign that has resulted in a database containing detailed information on channel condition, hydraulics, sedimentary characteristics and other attributes of over 30 stream segments across a gradient of urbanization and landscape settings. Drainage basins have been delineated for all sites and we have quantified several essential watershed metrics for each stream (e.g. watershed area, % impervious, annual rainfall, % burned within last few years, and NRCS soil types vs. rock). Several tools were developed to support processing of the field data, including automated spreadsheets for combining sieve and pebble count sediment samples, as well as for performing numerous hydraulic analyses and generating stream stability metrics. We have also made progress in developing tools for classification and extrapolation flow duration curves from gaged to ungaged sites in regional hydrologic analyses and have populated a database with pre-development flood estimates for each field site.

Over the past year, we have completed a draft hierarchical, multi-scale screening tool for assessing relative risk of stream reaches to the effects of hydromodification. The screening tool includes office/GIS and field assessment levels at watershed, valley and reach scales. Based on extensive field reconnaissance we have identified descriptors of the key physical processes influencing channel responses to hydromodification. For the watershed scale component of the screening tool, there has also been progress on developing a simple classification basin types in terms of the spatial arrangement of channel forms and prevalence of relatively susceptible channel segments. Fourth, we have continued work on developing the modeling tools, focusing on two fronts. This tool will undergo field testing, followed by initial “trial application” in early 2010.

Over the past year, we have also continued testing several existing mobile boundary sediment transport models for potential use in developing simplified tools (nomographs/regressions) of probable channel responses to hydromodification. Towards this end, we have identified a range of hydrologic-geomorphic scenarios for testing the models for their applicability to streams in the study region. We have also developed phase diagram/regime relationships based on sediment transport theory to examine their consistency with results from the more complex mobile boundary models in terms of the extent of channel changes initiated by varying degrees of altered water and sediment regimes. Finally, we have taken advantage of several opportunities for outreach and education. Outreach activities over the past quarter included meeting with the Orange County stormwater copermittees, participating with the San Diego County

hydromodification Technical Advisory Committee, attending a meeting on the Stormwater Monitoring Coalitions's LID/hydromodification workgroup, meeting with the Los Angeles Regional Water Quality Control Board and Ventura County on hydromodification management, and participating with the California Association of Stormwater Quality Agencies (CASQA) hydromodification workgroup.

Low Impact Development Study

Status: 70% complete

Project budget: \$1,100,000 (\$500,000 SMC plus \$600,000 State Prop 40 Grant)

The Low Impact Development Guidance (LID) Study is being conducted with funding from the State Water Resource Control Board's Consolidated Grants Program, under the Urban Runoff Program of Proposition 40. A proposal was submitted by the County of San Bernardino on behalf of the SMC for the LID Project known as "LID Guidance and Training for Southern California."

The LID Project will develop a comprehensive program to incorporate LID strategies and techniques into the planning and design of public and private sector projects. The LID Project will develop a model program for localities in California that are interested in adopting LID strategies and techniques. This will include determining the key technical and institutional issues that must be addressed for successful implementation, pilot projects that demonstrate the effectiveness of LID, and training and outreach to help solidify an implementation strategy to ensure large-scale and long-term success.

The grant funded portion of the project is organized into the following funding areas:

1. **Pilot Project Planning and Design.** *Establish design criteria and site selection*
2. **Monitoring.** *Implementation and demonstration of technology*
3. **Outreach and Training.** *Reporting and facilitation of wide-spread programmatic implementation*

The SMC will provide the required 25% matching funds (\$200,000) for the grant funded tasks. These tasks include preparing a literature review, conducting a series of training workshops, and developing a field monitoring program for LID features. The Literature Review has been completed and the final report will be made available through the California Stormwater Quality Association Website and the SMC website when operational.

A Technical Advisory Committee (TAC) has been established and has reviewed the Literature Review, the initial training materials. The TAC will meet as needed to advise the project as it proceeds.

The SMC completed focused on three major milestones thus far. First, the literature review was completed in year 1. The literature review can be found on the SMC web site [www.socalsmc.org]. Second, the SMC supported several training workshops including August 29, 2007 at Inland Empire Utilities Agency in Chino; November 6, 2007 at the

Urban Water Institute in Costa Mesa; and June 6, 2008 at the Metropolitan Water District in Los Angeles. Third, the SMC drafted the Technical Design and Guidance Document. This document captures the essential elements of LID selection, guidance criteria, and implementation recommendations. The Guidance Manual is being prepared in a web-portal format to allow efficient access via the World Wide Web. Fourth, the SMC initiated monitoring of LID technology. One site has is being monitored in Irvine and several others are in preparation to be monitored in Los Angeles, Riverside (Riverside County Flood Control and Water Conservation District pilot LID testing facility), and Rancho Cucamonga.

Work on this project was reduced from December 2008 to June 2009 due to State's freeze on all Proposition 40 Grant projects. The SMC and the County of San Diego provided bridge funding to ensure cost-effective opportunities are not lost, but completion of project milestones has been delayed. The web-based Guidance Manual is expected to be completed by the end of 2009.

ATTACHMENT 58

ANNUAL REPORT 2010-2011

**Stormwater Monitoring Coalition
Of Southern California**

DRAFT - September 30, 2011

INTRODUCTION

As a result of the increasing regulatory focus and the lack of scientific knowledge base, both stormwater regulators and municipal stormwater management agencies throughout southern California have developed a collaborative working relationship. The goal of this relationship is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop the tools that will effectively and efficiently improve stormwater decision-making. As individuals and agency representatives, there was early recognition that these issues are oftentimes not localized, but typically cross watershed and jurisdictional boundaries. This relationship culminated in a formal letter of agreement, signed in 2000 and again in 2009, by all of the Phase I municipal stormwater NPDES lead permittees and the NPDES regulatory agencies in southern California to create the Stormwater Monitoring Coalition (SMC) (Table 1).

Table 1. List of member agencies in the Stormwater Monitoring Coalition.

California Regional Water Quality Control Board, Los Angeles Region
 California Regional Water Quality Control Board, San Diego Region
 California Regional Water Quality Control Board, Santa Ana Region
 California Department of Transportation, Caltrans
 City of Long Beach
 City of Los Angeles, Watershed Protection Division
 County of Orange, Public Facilities and Resources Dept.
 County of San Diego Stormwater Management Program
 Los Angeles County Department of Public Works
 Riverside County Flood Control and Water Conservation District
 San Bernardino County Flood Control District
 Southern California Coastal Water Research Project
 State Water Resources Control Board
 US Environmental Protection Agency, Office of Research and Development
 Ventura County Watershed Protection District

The first project supported by the SMC was to develop a five-year Research Agenda. The research agenda, published in 2001, consisted of 15 unique projects that the SMC ranked, prioritized, and then funded on a voluntary basis. The SMC has made tremendous progress implementing the Research Agenda. To date, over a dozen projects have been implemented by the SMC.

The value of the SMC to its member agencies is at least four-fold. The first is the ability to share costs for implementing projects. Cost reductions for SMC member agencies can be significant since collaborative projects can reduce costs by more than 90% relative to footing the bill alone. In addition, the majority of projects have nonmember agency cost-matching. Just for the projects described in this report, there has been nearly one million dollars in grant awards, cost-match, or in-kind services. The second value to member agencies is the ability to stretch their agency's skill base. Stormwater management requires a wide variety of knowledge including regulatory policy, engineering, hydrology, biology, chemistry, toxicity, and microbiology, to name a few. Many member

agencies have limited staff and, by working together, garner the additional skills that are not sustainable within each agency. A third asset of membership is the ability to communicate. Discussions among member agencies provide context and a richness of ideas for application to local issues back home. Similarly, discussion between regulatory and regulated agencies in an informal setting leads to more effective implementation of management activities. Finally, projects conducted under the SMC umbrella have nearly always resulted in some management action. Often, it is difficult for a single agency to affect the current course of regulatory management. Because SMC projects are initiated and vetted through all of the regulated and regulatory management agencies, the results are adopted quickly into the management framework including alterations to NPDES permits.

The SMC has shown tremendous growth over the last 10 years. The SMC has faced and overcome several potential stumbling blocks such as project funding mechanisms, turnover of member agency staff, identifying and implementing outreach and communication activities, and invigorating new project leadership. The SMC now faces a new set of challenges for the year to come. Most significant of these is the ability to identify and implement a new research agenda. The technical complexities facing stormwater managers and the ever-expanding regulatory framework in which they interact seems enormous. The new research agenda should help identify, clarify, and prioritize the direction of the SMC for the next phase of its existence. A second test of the SMC's growing pains is its ability to adapt and evolve. For example, initiating and authorizing new project agreements now takes over two years. This is insufficient for an organization that wants to be adaptive and respond to opportunities.

PROJECT ACCOMPLISHMENTS

Stormwater Data Compilation Study

Status: 90% complete

Initial Project Budget: \$75,000 (Resources provided by SCCWRP)

Amended Project Budget: \$110,000 (Resources provided by SCCWRP)

Assessment and prioritization for mitigating water quality requires context. Knowledge of mean concentrations across watersheds, counties, and regulatory jurisdictions provides the perspective needed for managers to rank waterbodies for management action. Regional reference condition, frequency of water quality objective exceedences, extent and distribution of parameter concentrations all play a part in determining where a manager's worst problem occur.

To help managers gain the necessary perspective, the SMC described a project in their Research Agenda that compiles water quality monitoring information regionwide. For several years, the SMC has been building the necessary infrastructure to support such an effort. Data sharing protocols, interlaboratory calibrations, and web-enabled interfaces all enhance the SMC's ability to share data. The goal of this project is to compile the existing water quality monitoring information. Initially starting with nutrients, the

objective will be to make annual estimates of concentrations and mass emissions from 25 watersheds between Ventura and San Diego.

To date, more than 600,000 data records have been compiled among all SMC agencies. Initial assessments indicated that there was tremendous variation and completeness among the data submittals. However, the greatest hindrance towards achieving our goal was not the lack of concentration data, but the lack of flow data. Ultimately, this impacted the ability to estimate annual loads. The data set is currently being augmented with modeling based information to compile final load estimates.

Implementing A Regionally Consistent and Integrated Freshwater Stream Bioassessment Monitoring Program

Status: 75% complete

Project budget: \$150,000 (\$75,000 contract from the SWRCB)

Assessment of freshwater biological communities represents a potentially powerful tool for evaluating the effects of discharges in southern California creeks and streams. Bioassessments integrate the effects of multiple stressors, including chemical pollutants and physical alterations in receiving waters. The value of biological assessments is that they are closer to many of the defined beneficial uses of receiving waters (i.e. aquatic life, warm water habitat, cold water habitat) than chemically-derived water quality objectives. As a result, virtually every SMC member agency has biological community monitoring in their respective NPDES permits.

The goal of this study is to implement a coordinated, integrated regional bioassessment monitoring program. Previously, the SMC had worked together to design an optimal monitoring program that satisfied both local needs, but simultaneously provided information that could be combined to make regionwide assessments. Monitoring questions included: 1) What is the extent of impact in streams of southern California? 2) What are the stressors that impact southern California streams? and 3) Is the extent of stream impacts changing over time?

This is the third year of a five-year project. In the first year, over 110 sites were sampled between Ventura and San Diego counties for biological communities, water quality, physical habitat, and riparian condition. Preliminary results indicated that roughly 50% of the stream miles in southern California have healthy biological communities. In addition, the extent of chemical contamination appears lower than previously thought. For example, less than 3% of the stream miles exceeded the chronic water quality criterion for copper. Sampling for the third year is now finished and samples are at the laboratory for analysis. The first year report, along with a fact sheet, was published this year.

- RD Mazor, DJ Gillett, K Schiff, K Ritter, E Stein. 2011. [Ecological Condition of Watersheds in Coastal Southern California: Progress Report of the Stormwater Monitoring Coalition's Stream Monitoring Program First Year \(2009\)](#). Technical

Report 639. Prepared for the Stormwater Monitoring Coalition Bioassessment Workgroup. Southern California Coastal Water Research Project. Costa Mesa, CA.

The SMC regional watershed monitoring program is now serving as a model for other parts of the state. Regional watershed programs in the San Francisco Bay and the Central Valley are planning to use the SMC as a model for their design and implementation. Perhaps the biggest value of the SMC regional watershed monitoring, however, is its connection to the SWRCB's development of biological objectives. This new policy will set narrative and numeric limits on biological condition in streams statewide. Because of the unique collaboration in southern California, approximately one-third of the data used to develop the biological objectives will come from the SMC region.

Our main collaborator on this project is the California Department of Fish and Game (CDF&G) and SWRCB. The project is 50% funded by the SWRCB, whose main desire is to ensure integration with the Surface Water Ambient Monitoring Program (SWAMP).

Hydromodification Study

Status: 80% complete

Project budget: \$1,137,440 (State Prop 50 Grant)

The process of urbanization has the potential to affect stream courses by altering watershed hydrology. Development and redevelopment can increase the amount of impervious surfaces on formerly undeveloped landscapes. This reduces the capacity of remaining pervious surfaces to capture and infiltrate rainfall and, as a result, a larger percentage of rainfall becomes runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so peak discharge rates post-development are higher compared to predevelopment for an equivalent rainfall event. This process has been termed hydromodification.

Hydromodification can result in adverse effects to stream habitat, surface water quality, and water supply. The stream erosion that results from the increased peak flow can threaten infrastructure, homes, and businesses. Intermittent and ephemeral streams that possess riparian and wetland habitat are at particular risk from effects of hydromodification. Streams in semi-arid regions are especially vulnerable to urbanization due to a prevalence of sand bed channels, lack of vegetative reinforcement, and relatively large net changes in water and sediment supply associated with stormwater runoff. Recent studies by the SMC have indicated that intermittent and ephemeral streams in southern California degrade at lower levels of watershed urbanization than streams in the eastern US.

In response to the effects of hydromodification, state and local agencies are developing standards and management approaches to control and/or mitigate the effects of hydromodification on natural and semi-natural stream courses. Successful implementation of these regulatory programs requires development of tools to better

assess hydromodification effects and develop appropriate mitigation and management strategies.

The goal of this project is to develop a series of tools supporting implementation of hydromodification management measures that could be used to better protect the physical, chemical, and biological integrity of streams and their associated beneficial uses. This project will provide tools to answer the following questions: 1) Which streams are at the greatest risk from the effects of hydromodification? 2) What are the anticipated effects in terms of increased erosion, sedimentation, or habitat loss, associated with increases in impervious cover? 3) What are some potential management measures that could be implemented to offset hydromodification effects and how effective are they likely to be?

This project is being conducted in collaboration with researchers from Colorado State University, Fort Collins. Several major elements have been completed this year. Building off the previously completed literature review and field work, we completed the GIS-based and field-based hydromodification screening tools that can be used to evaluate susceptibility of channels to hydromodification effects. The tools were published in a series of three technical reports:

- Bledsoe B.P, R.J. Hawley, E.D. Stein, D.B. Booth. 2010. [Hydromodification Screening Tools: Technical basis for development of a field screening tool for assessing channel susceptibility to hydromodification](#). Southern California Coastal Water Research Project Technical Report #607.
- Bledsoe B.P, R.J. Hawley, E.D. Stein, D.B. Booth. 2010. [Hydromodification Screening Tools: Field manual for assessing channel susceptibility](#). Southern California Coastal Water Research Project Technical Report #606.
- Booth D.B., S.R. Dusterhoff, E.D. Stein, B.P. Bledsoe. 2010. [Hydromodification Screening Tools: GIS-based catchment analyses of potential changes in runoff and sediment discharge](#). Southern California Coastal Water Research Project Technical Report #605.

Use of these tools has been incorporated into several municipal stormwater permits. Therefore, SCCWRP staff has held training sessions on use of this tool and are working with the water board training academy on establishing an ongoing training program.

Over the past year, we also completed the analysis of forty-three regional U. S. Geological Survey gauges with records greater than ~20 yrs located in watersheds ranging from 1.3 – 272 km² to develop regionally calibrated, empirically derived models that can be used to estimate flow from ungauged streams throughout southern California. These models can be used to supplement the USGS regional regression equations with more local data. Retrospective analysis of these flow gauges also showed that large increases were observed in instantaneous-peak flows of more frequent return periods (e.g., 1.5 and 2 year storms), with greater than a 5-fold increase in 2-year events (Q2) observed in a watershed with 20% imperviousness relative to \leq ~1% imperviousness.

Effects of urbanization decreased for larger, less frequent storms. The results of these analysis are provided in the following technical report:

- Hawley, R.J., B.P. Bledsoe and E.D. Stein 2011. [Hydromodification Effects on Flow Peaks and Durations in Southern California Urbanizing Watersheds](#). Southern California Coastal Water Research Project Technical Report # 654.

Finally, progress was made over the last year on the final two deliverables of this project; guidance on model application and a framework for hydromodification monitoring. Drafts of both documents were developed in coordination with a technical workgroup and will be ready for review in early 2012.

Effects of Wildfires on Contaminant Runoff and Emissions

Status: 85% complete

Project Budget: \$100,000 + in-kind contributions (\$75,000 provided by San Diego County, \$25,000 provided by the Los Angeles Regional Water Quality Control Board, in-kind services provided by UCLA and Los Angeles County Flood Control District)

Fire is a natural component of Mediterranean ecosystems, such as those found in southern California. Due to loss of plant cover, severe burns have been shown to increase runoff and sediment generation to downstream areas. Constituents associated with the increased runoff have the potential to affect water quality in downstream receiving waters and the near-shore coastal environment. This may be especially problematic for streams that are already impaired. Most research on post-fire water quality has focused on nutrient and sediment enrichment in relatively natural areas. However, post-fire runoff also has the potential to increase loadings of carbon, organic compounds such as PAHs, and trace metals. Constituent loadings may occur by several mechanisms over a range of spatial and temporal scales. Potential loading mechanisms include direct runoff, debris flows, or atmospheric deposition of ash followed by storm runoff. Investigating the magnitude and duration of fire effects in downstream and/or adjacent watersheds is critical to accounting for its influence on cumulative water quality impacts and attaining water quality standards.

This goal of this project is to investigate the fate of water quality constituents resulting from southern California wildfires in order to quantify the effects of post-fire runoff on downstream metals and organic constituent concentrations and loads. Contaminant loading and effects on instream biota will be investigated as part of this project.

A regional post-fire monitoring strategy was completed in 2009 that describes an agreed-upon approach for post-fire sampling.

- ED Stein, J Brown. 2009. [Effects of post-fire runoff on surface water quality: Development of a southern California regional monitoring program with management questions and implementation recommendations](#). Technical Report 598. Southern California Coastal Water Research Project. Costa Mesa, CA.

This plan was implemented for the first time following the 2010 Station Fire, which burned portions of the Los Angeles and San Gabriel River watersheds. Two sites were sampled for solids, metals, and PAHs over six storms following the 2010 fires; Tujunga Wash and Arroyo Seco. Results showed dramatic increases in concentrations and loads of all constituents sampled following storms, but returning to near pre-fire levels by the end of the storm season. The results of this analysis have been written up as for submittal a journal and inclusion in this year's SCCWRP Annual Report. Additional analysis of post-fire pollutant concentration data has been compiled for storms dating back to 2003. This data is currently being analyzed for regional patterns and to investigate factors that may influence pollutant loading (e.g. burn intensity, pre-fire vegetation, watershed size). In addition, post-fire bioassessment data from both the 2003 San Diego county fires and the 2009 Los Angeles County Station fire have been compiled and are being analyzed to assess fire effects on benthic indices typically used as part of regional bioassessment monitoring. This analysis will continue over the next year.

Low Impact Development Study

Status: 80% complete

Project budget: \$1,100,000 (\$500,000 SMC plus \$600,000 State Prop 40 Grant)

The Low Impact Development Guidance (LID) Study is being conducted with funding from the State Water Resource Control Board's Consolidated Grants Program, under the Urban Runoff Program of Proposition 40. The LID Project will develop a comprehensive program to incorporate LID strategies and techniques into the planning and design of public and private sector projects. The LID Project will develop a model program for localities in California that are interested in adopting LID strategies and techniques.

This project has been successful in attaining these goals:

- *Develop interim guidance and training for LID implementation.* Four training sessions were held throughout the Southern California region from 2007 through 2008.
- *Determine effectiveness of LID for reduction of pollutant loads and hydrologic changes in Southern California.* Monitoring results were used to assess the volume and concentration benefits to discharges, the percentage of runoff from various BMPs and LID systems measured, and a review of the soil type. There are ongoing LID monitoring programs that will provide additional results regarding the effectiveness of LIDs in Southern California.
- *Develop guidelines on specifications and standards for Project design and review.* The SMC and CASQA finalized the LID Guidance Manual in April 2010. It is now located on the CASQA web site.
- *Develop final guidance and training materials using field data.* This goal was partially met. The San Bernardino Flood Control District and the SMC have developed final guidance and training materials using the feedback from interim trainings, the literature review, and using the final LID Guidance Manual. However, field data collected as part of this project has yet to be incorporated into the LID Guidance Manual.

- *Conduct training workshops in Southern California.* In addition to the interim training workshops, final Training was provided by online web access to the Manual and presentations that provided manual content and access information.

The District coordinated with various regional and statewide efforts that involved LID training, including San Diego County, the California Water and Land Use Partnership, the California Coastal Commission, the Local Government Commission, and the Chino Basin Landscape Alliance. The collaborative regional effort was a critical networking tool that provided additional funding, technical support, and LID monitoring opportunities. Partner agencies included the County of San Diego, Riverside County, and CASQA, all of whom helped support the project when Grant funding was frozen mid-project by the State of California. Approximately \$260,000 has been leveraged for future activities during the 2010-2011 and 2011-2012 fiscal years.

SMC and CASQA plan to continue updating the LID Guidance Manual and provide training sessions. Monitoring is planned to continue through spring of 2012. Monitoring reports are expected to be provided upon completion of data analysis and reporting.

Barriers to Low Impact Development (LID) Study

Status: 40% complete

Project Budget: \$30,750 (\$27,000 County of San Diego, \$1,250 Riverside County Flood Control & Water Conservation District, \$1,250 Ventura County Watershed Protection District, San Bernardino County Flood Control District, \$1,250)

While many communities understand the benefits of low impact development (LID), getting LID projects built has been difficult. In an effort to address the difficulties in LID implementation, the SMC has commissioned the Local Government Commission (LGC) to investigate the barriers its members are facing, and to prioritize strategies to remove those barriers. Of particular interest are external barriers at the state level over which local jurisdictions do not have control.

To date, a literature review focusing on the site design and approval processes and associated codes, processes and perceptions has been completed. Barriers gleaned from the literature review were then compiled and shared with SMC members for review and comment. A comprehensive list of barriers taken from the literature review and from SMC member comments were then incorporated into an online survey that was distributed to local, regional, and state agencies where they were asked to rank the significance of each barrier as it applied to their jurisdiction. Another online survey was created for and distributed to the development community to gather feedback from the private sector. Phone interviews and three small focus groups are set to occur in late October and early November, which will allow a more in-depth investigation of barriers for implementing LID in Southern California.

LGC will generate a report summarizing research process as well as research findings. This report will be presented at SMC's December 2011 meeting where LGC will also receive input from SMC members regarding the key barriers LGC should focus on in Phase II of this project, which is developing strategies for overcoming key barriers. The project will be completed by May 2012.

ATTACHMENT 59

Southern California Stormwater Monitoring Coalition

About SMC



The SMC was formed in 2001 by cooperative agreement of the Phase I municipal stormwater NPDES lead permittees, the NPDES regulatory agencies in southern California and the Southern California Coastal Water Research Project. The SMC has been so successful that the member agencies have renewed the **Cooperative Agreement** for another five years commencing June 2008 and added three new member agencies, the California Department of Transportation, the City of Los Angeles, and the State Water Resources Control Board. The current list of SMC members is as follows:



County of Los Angeles, Department of Public Works



County of Orange, OC Public Works



County of San Diego, Department of Public Works



Riverside County Flood Control and Water Conservation District



San Bernardino County Flood Control District



Ventura County Watershed Protection District

Image result for City of Long Beach Public Works Department
ca

City of Long Beach Public Works Department



City of Los Angeles, Department of Public Works



California Regional Water Quality Control Board, Santa Ana Region



California Regional Water Quality Control Board, Los Angeles Region



California Regional Water Quality Control Board, San Diego Region



State Water Resources Control Board



California Department of Transportation



Southern California Coastal Water Research Project (SCCWRP)

Collaborating Organization



**US Environmental Protection Agency, Office of
Research and Development**

The SMC also has a cooperative **Memorandum of Understanding** with the United States Environmental Protection Agency Office of Research and Development to facilitate the development of scientific and technical tools for stormwater program implementation, assessment, and monitoring.

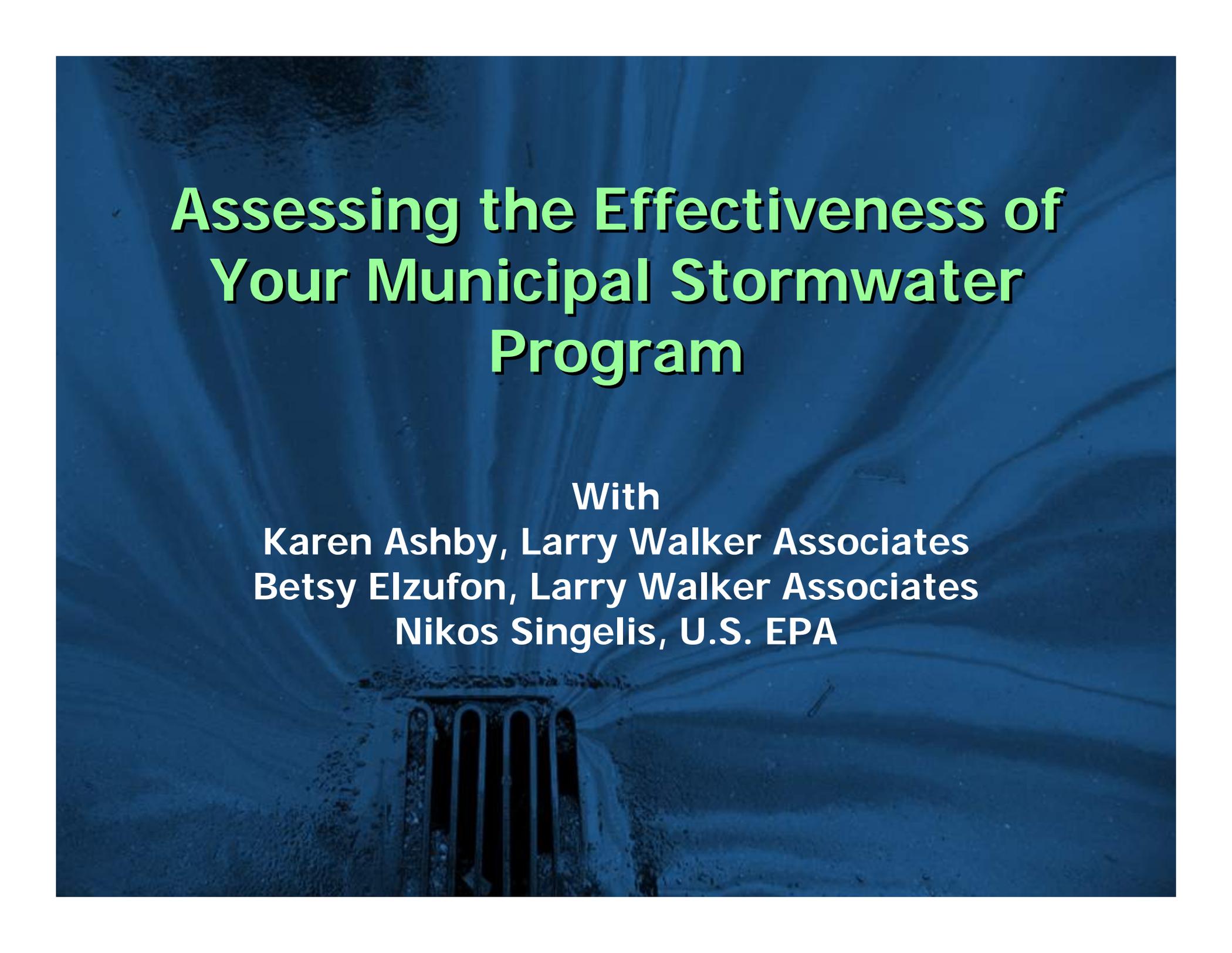
The SMC is managed by Steering Committee of its members that meets quarterly to review new projects and assess progress on ongoing projects.



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ATTACHMENT 60



Assessing the Effectiveness of Your Municipal Stormwater Program

With

Karen Ashby, Larry Walker Associates

Betsy Elzufon, Larry Walker Associates

Nikos Singelis, U.S. EPA

Guide to Our Webcasts

For Technical Support click the "Help" button

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Topics:

- **Planning and Priority Setting for MS4s**
- **Key Elements for Effective Municipal Programs**
- **Measuring and Assessing MS4 Programs**
 - California Stormwater Quality Association (CASQA)
Municipal Stormwater Program Effectiveness Assessment Guidance
- **Municipal Operations/Good Housekeeping Case Study**

Planning and Priority Setting

Know Your Watershed!

- Water Quality Standards/Designated Uses
- Existing impacts (impairments and TMDLs)
- Land uses, current and future
- Social factors
- Regulatory framework
- Drainage and flooding issues



Planning and Prioritizing



Planning Should Occur at Multiple Levels

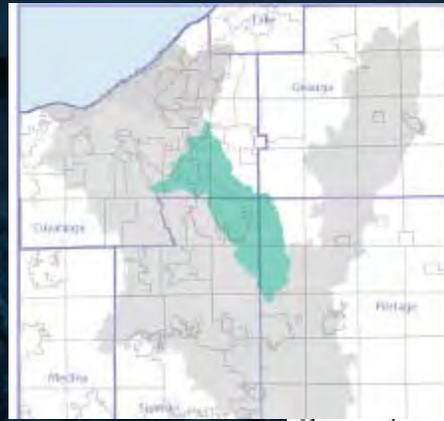
- **Geographic Scales**
 - Local (stream, wetland, etc.)
 - Watershed (river, basin, etc.)
 - Ideally, shared goals and implementation plans with MS4s, watershed organizations, etc.
 - Regional
 - Ideally, shared goals and implementation plans with MS4s, watershed organizations, etc.

Stormwater Management Plan

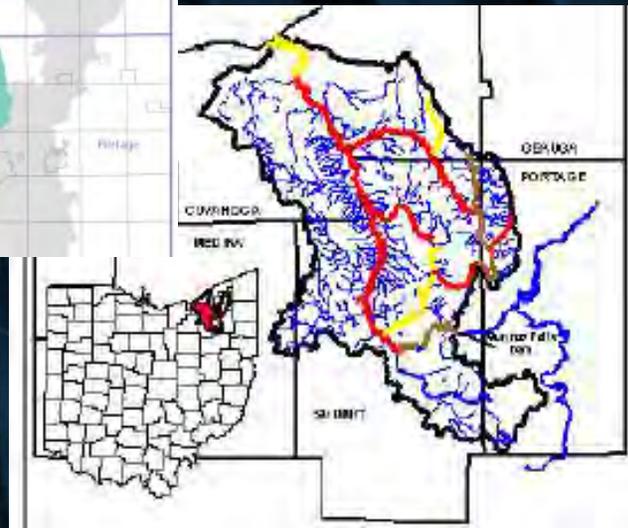
- Local plan will synthesize information from three levels, including:
 - Pollutants
 - Hydrologic/Physical
 - Biological
 - Current and future land use
- Consider sources
- Consider ability to affect change
- Develop a logical set of priorities and measurable goals to frame stormwater management plan

Example: Northeast Ohio

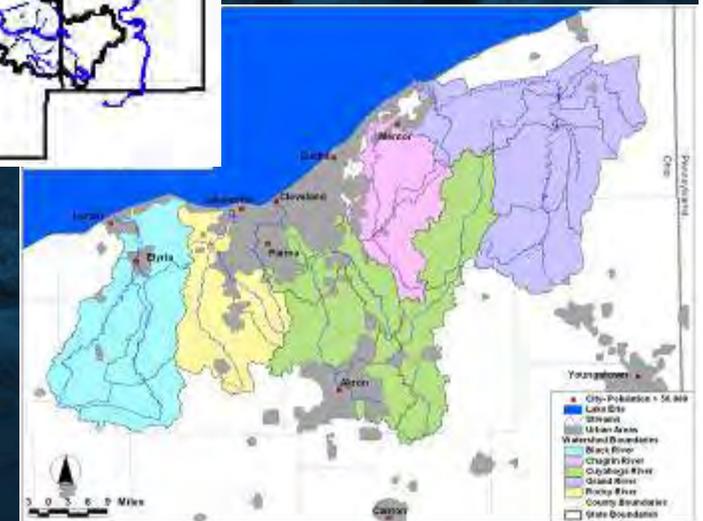
Local:
Tinker's Creek



Watershed:
Cuyahoga
River



Regional: Lake Erie



Possible Priorities for NE Ohio

- **Local (Tinker's Creek)**
 - Organic enrichment/dissolved oxygen
 - Wastewater treatment plants
- **Watershed (Cuyahoga River)**
 - Nitrogen and Phosphorus
 - Urban stormwater, particularly lawn care
 - Bacteria
 - CSOs and Urban Stormwater
- **Regional (Lake Erie)**
 - Phosphorus
 - Agriculture
 - Urban stormwater
 - Bacteria
 - CSOs and Urban Stormwater

MS4 Stormwater Management Program

- Clear and logical priorities
- Measurable Goals
- Detailed action plans

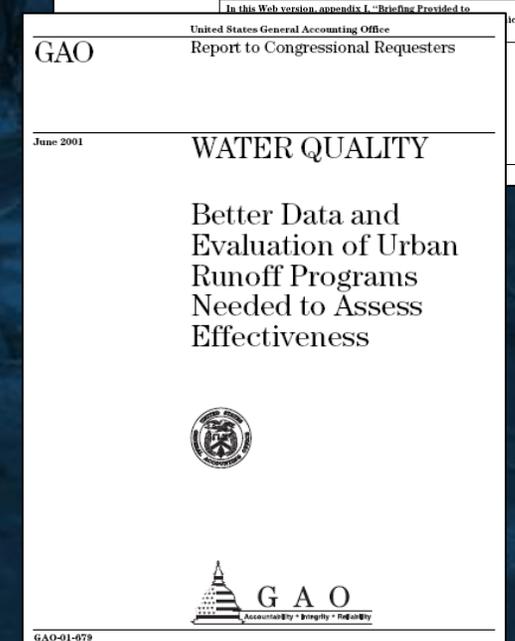
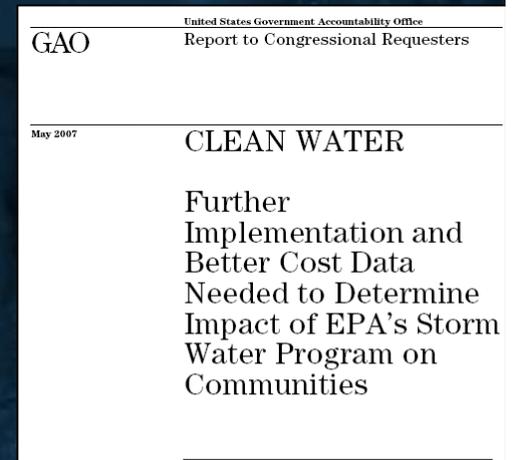
EPA's Compliance Monitoring Strategy

Provides inspection frequency goals for all NPDES program, including stormwater:

- Phase I MS4s – Audit every Phase I MS4 within five years. Inspect as needed.
- Phase II MS4s – Audit and inspect every Phase II MS4 within seven years
- www.epa.gov/compliance/resources/policies/monitoring/cwa/npdescms.pdf

Congress identified the need for better effectiveness information

- GAO found that neither costs nor effectiveness of stormwater program has been determined
- EPA must examine Phase II implementation starting in 2012





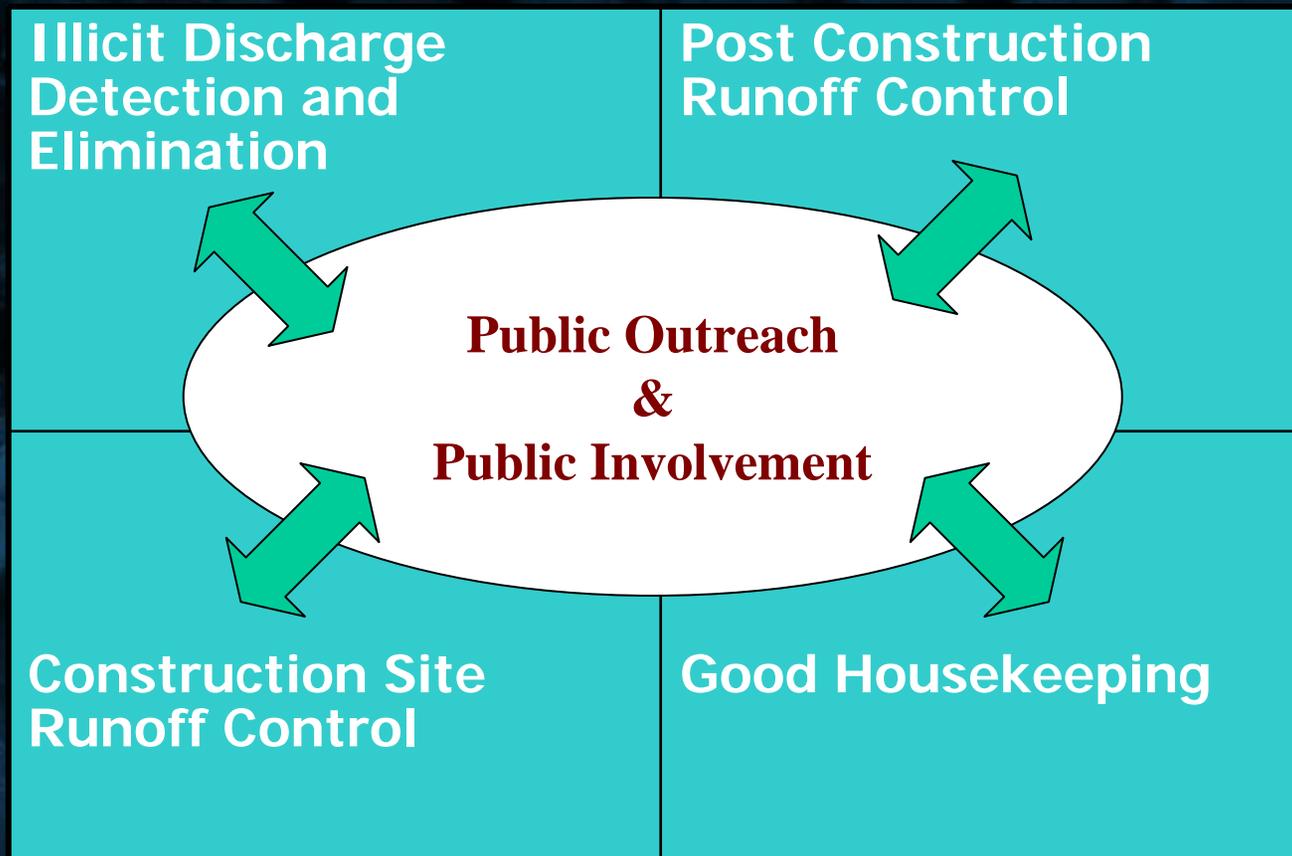
Essential Elements of Successful MS4 Programs

Public Education and Involvement

- EPA's *Getting In Step* manuals for outreach campaigns and stakeholder involvement
- More than just producing brochures!



Public Education & Involvement



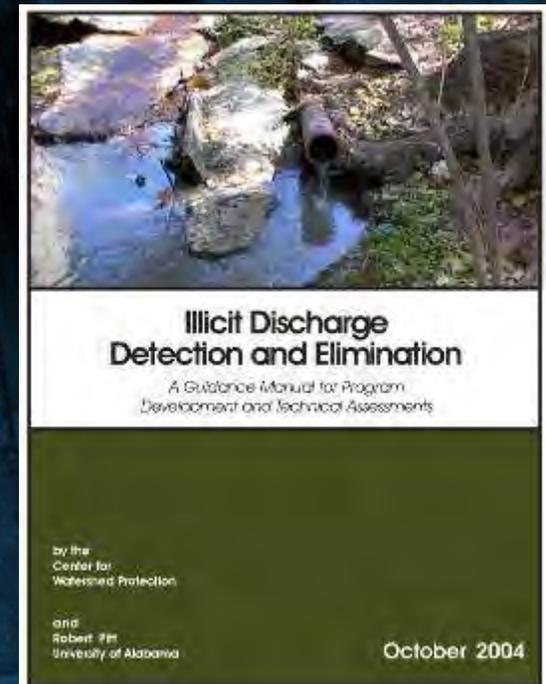
Public Ed. & Involvement Essentials

- Using the *Getting In Step* method:
 - Assessed knowledge and understanding
 - Developed priorities for outreach activities
 - Implemented at least one significant and sustained outreach campaign based on a pollutant of concern and designed to change behaviors
 - Implemented involvement activities, such as citizen's advisory committee, etc.

Eight Steps to Build an IDDE Program

Using the IDDE Manual:

- Audited Existing Resources & Programs
- Established Responsibility, Authority & Tracking
- Completed a Desktop Assessment of Illicit Discharge Potential
- Developed Program Goals & Implementation Strategies
- Searched for Illicit Discharge Problems in the Field
- Isolated & Fix Individual Discharges
- Prevented Illicit Discharges
- Evaluated the Program



IDDE: Key Elements

- **Ordinance**
 - Prohibition on non-stormwater discharges
 - Ability to stop discharges/correct problems
 - Access
 - Fines and Penalties
- **System map**
- **Assessment of sub-watershed potential**
- **Staff trained**
- **Tracking system**
- **Public education, e.g. hotline**
- **Address all obvious, flowing illicit discharges**



Construction Site Management

- Manage runoff from construction sites disturbing 1 or more acres of land, including smaller sites that are part of a larger, common plan of development



Construction: Key Elements

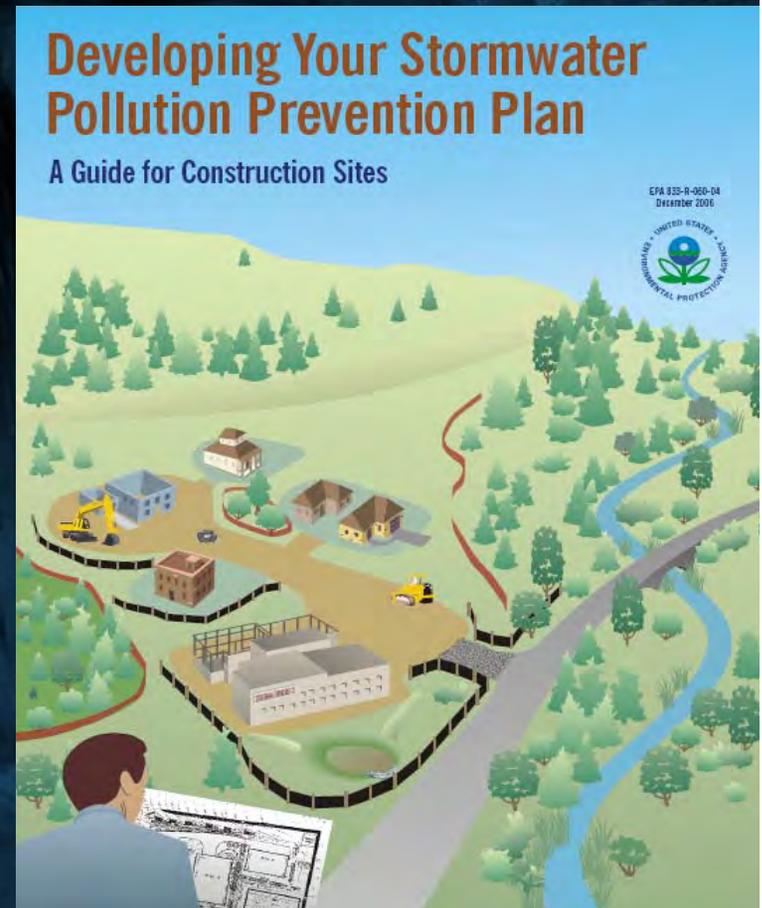
- Ordinance in place
 - Sediment and erosion
 - Good housekeeping/
pollution prevention
 - Submit plans for
review
 - Fines and penalties



Not a SWPPP!

Construction: Key Elements

- **Plan review process**
 - Trained staff
 - Integrated with post-construction review
 - Consider public input
- **Inspection**
 - Inventory and tracking of sites
 - Ability to respond to citizen complaints
 - Schedules, routine vs. targeted
- **Education**
 - Builders and developers, citizens, staff



Post-Construction

- **Develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects***



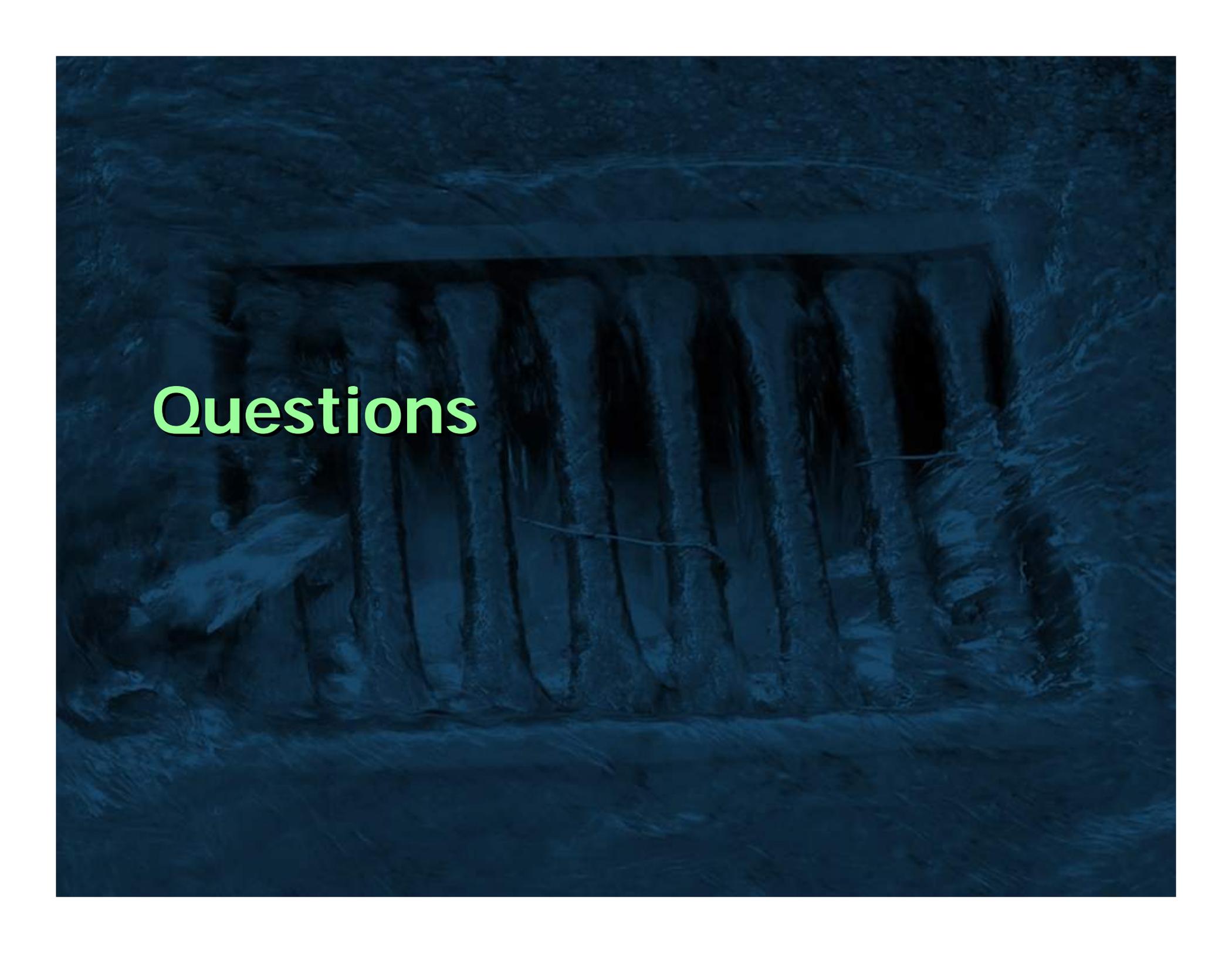
*that disturb one acre or more, including smaller projects that are part of a larger, common plan of development.

Post-Construction: Key Elements

- **Ordinance covering new development and redevelopment**
 - Requirements for plan review
 - Reference design criteria
 - Maintenance requirements
 - Fines and penalties
- **Developed or adapted design criteria, which include low impact BMPs**
- **Plan review process with trained staff**
- **Maintenance program**
- **Trained inspection staff**

Municipal Operations

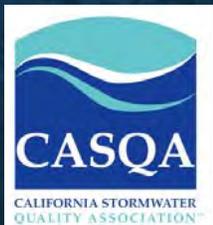
- **Develop a program to prevent stormwater pollution from municipal operations**
 - Training for employees
 - Standard operating procedures
 - Covers parks, building and fleet maintenance, construction, roads, streets, parking lots, maintenance yards, waste transfer stations, etc.



Questions

Approach to Municipal Program Effectiveness Assessment

California Stormwater Quality Association (CASQA)



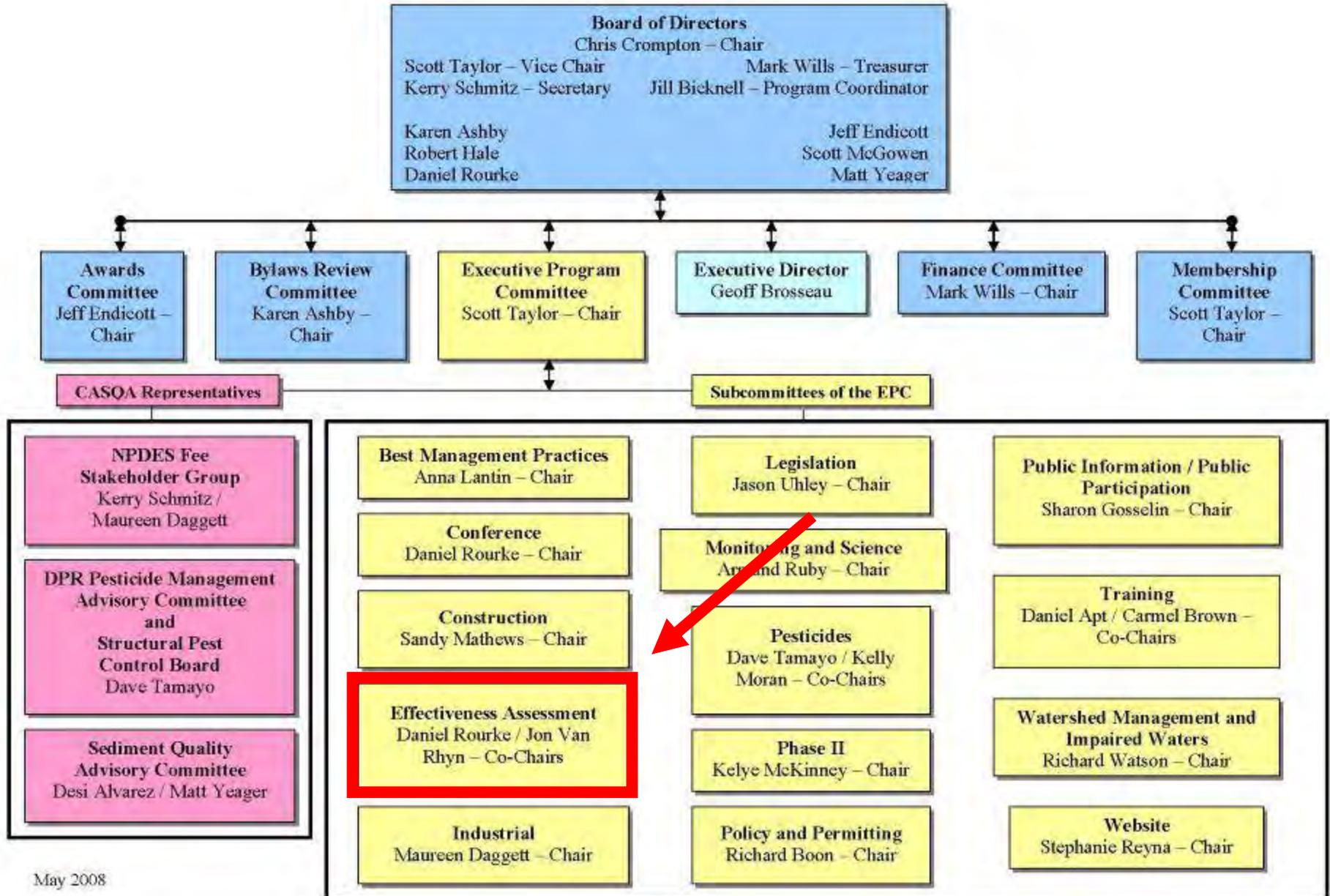
Introduction to CASQA

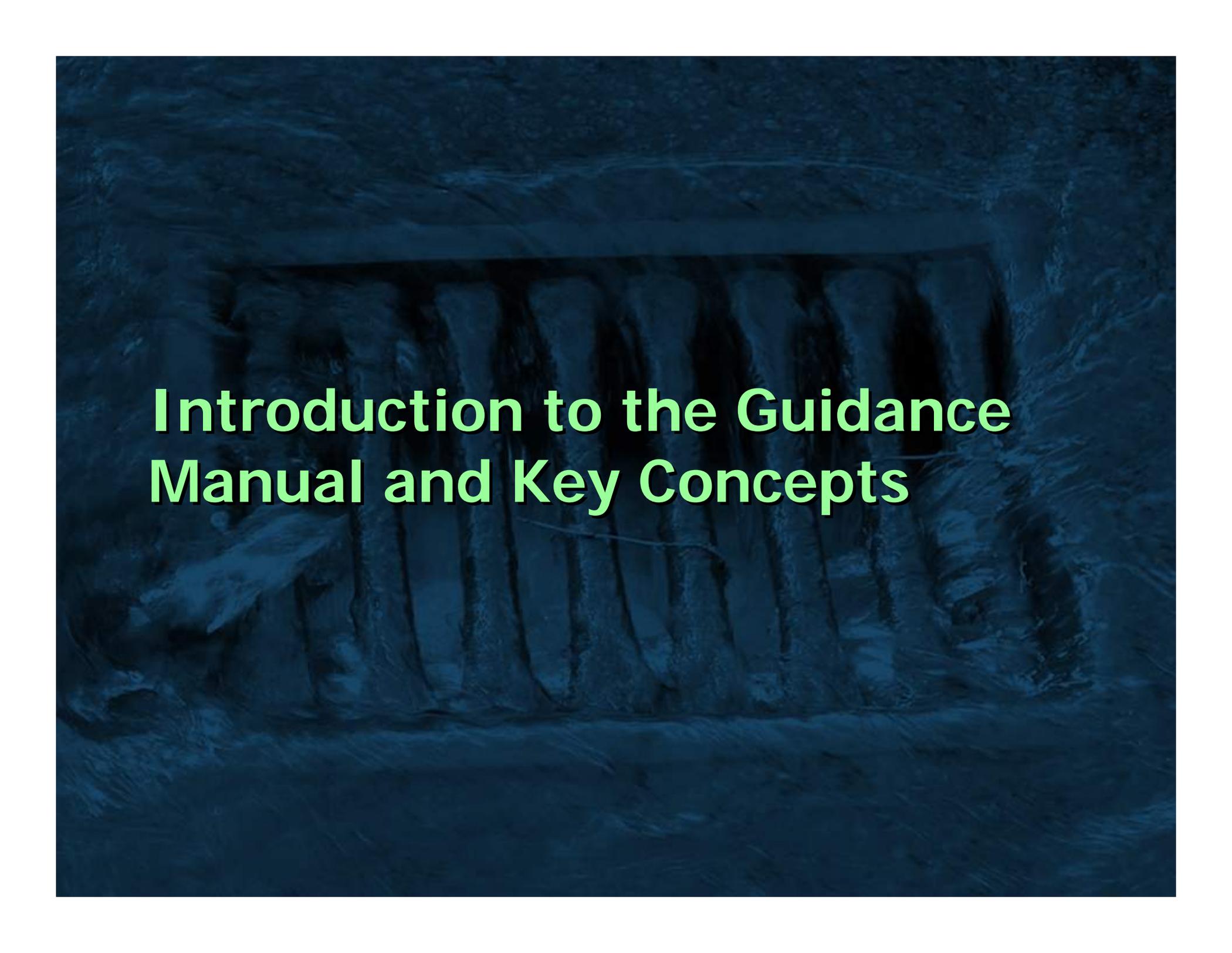


- Formed in 1989 as the SWQTF
- Transitioned to CASQA in 2002
- CASQA is a 501(c)(3) non-profit
- Membership comprised of a diverse range of stormwater professionals
- Hold bi-monthly meetings and an annual conference
- Board of Directors and Executive Program Committee

www.casqa.org

California Stormwater Quality Association (CASQA) 2008 Organizational Structure





Introduction to the Guidance Manual and Key Concepts

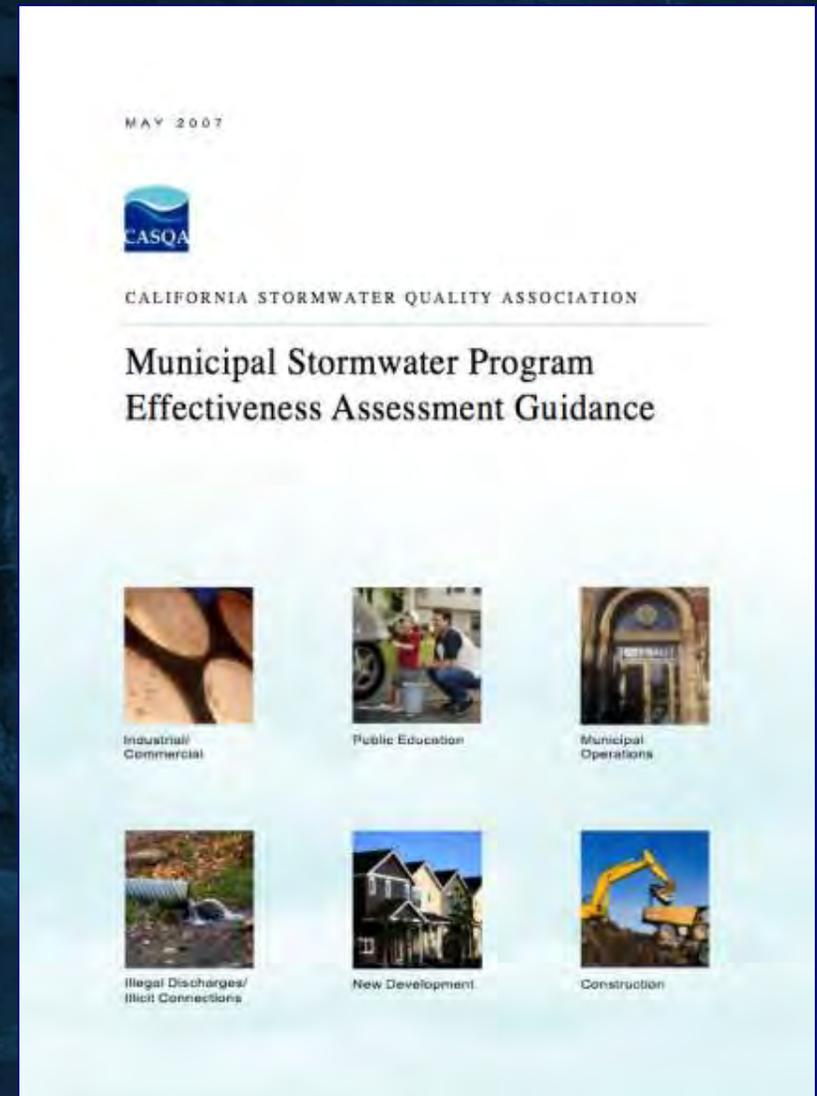
History of Guidance Document

- Regulatory requirements in permits
- Municipalities unsure how to conduct these assessments
- CASQA identified a need for a guidance document – worked with committee
- Developed white paper and then guidance document
- Received regulatory support

White Paper ~ 2 Years → Guidance Document

Guidance Document Approach

- Defines terms and key concepts
- Presents an assessment strategy
- Describes different assessment methods
- Identifies applicability to program elements/minimum control measures
- Provides examples

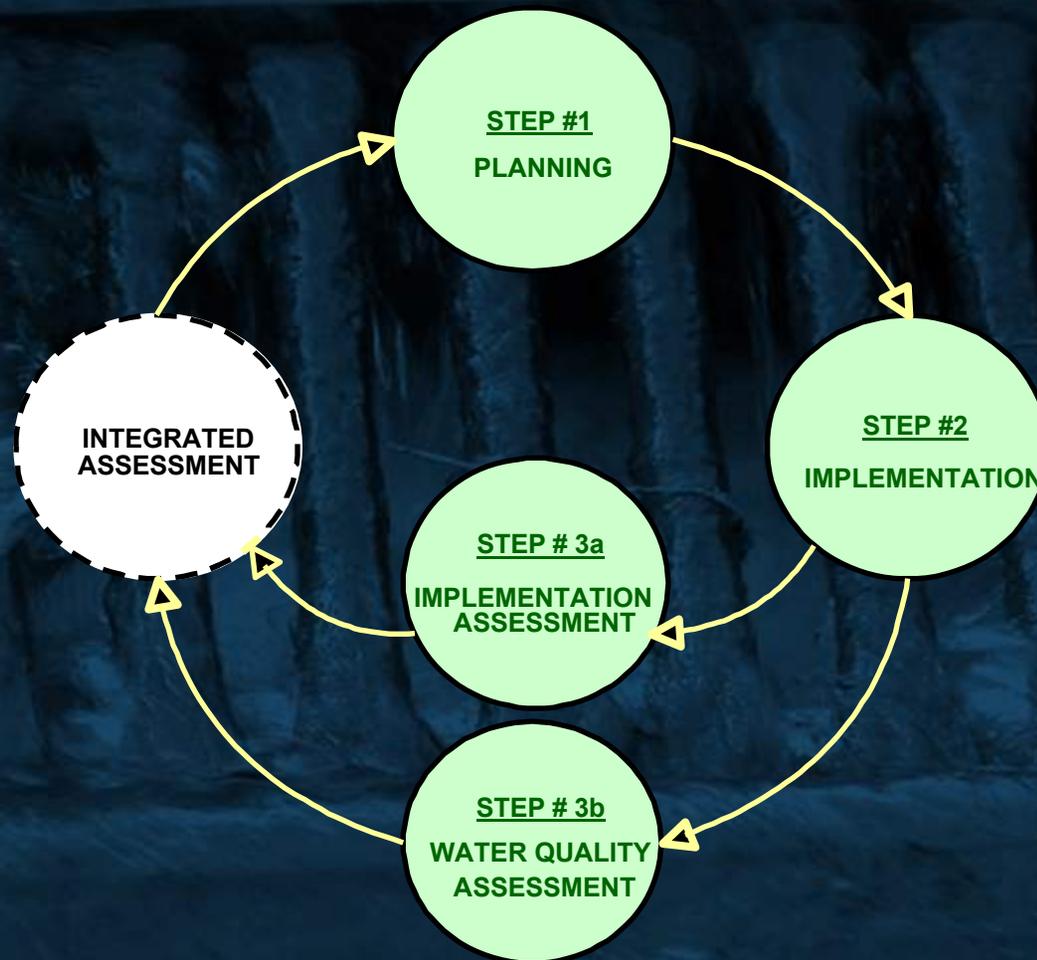


Why Conduct Effectiveness Assessments?

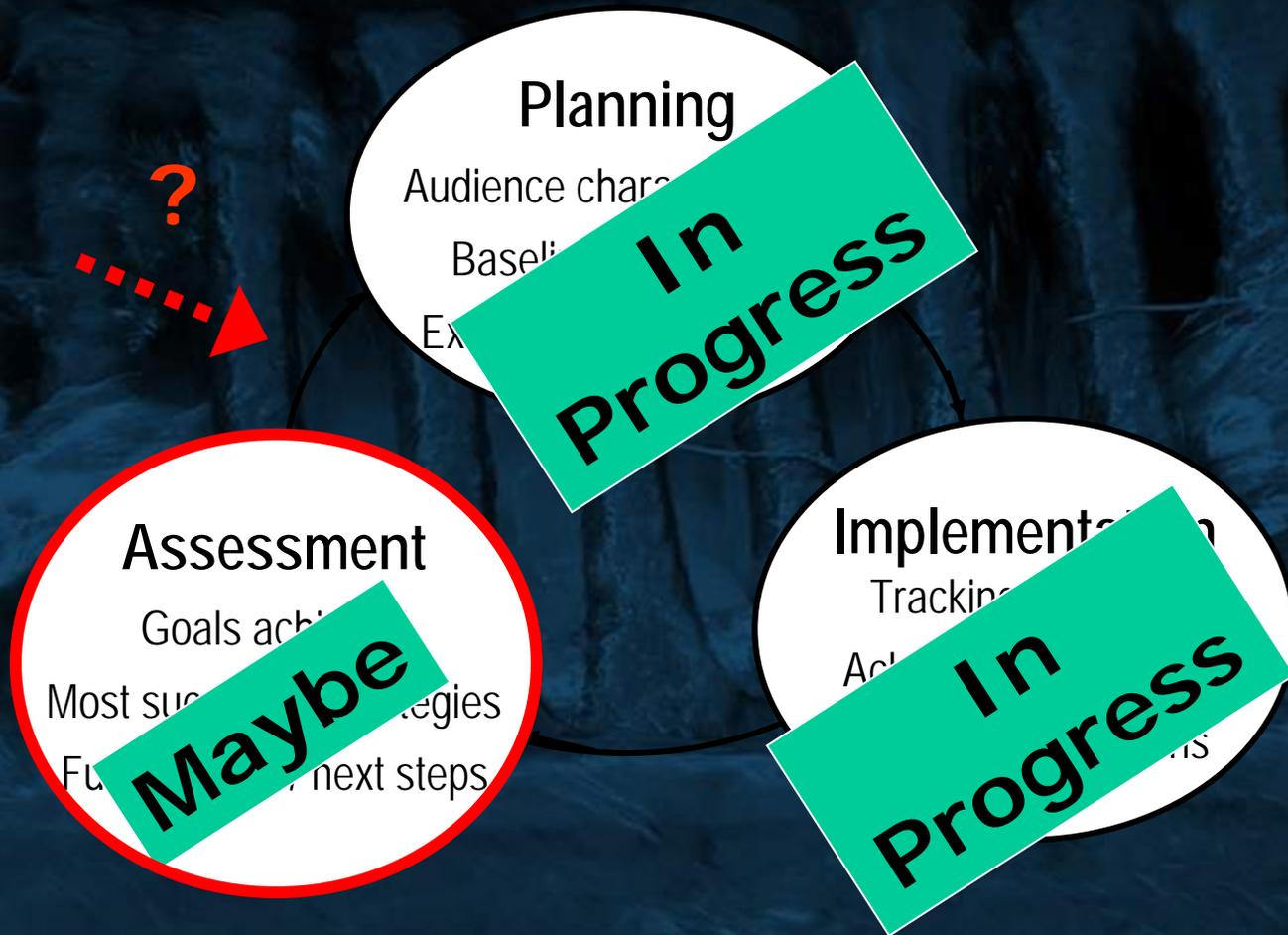
Use the Results to:

- Determine if the program is progressing towards its intermediary and long term goals
- Determine if data is meaningful
- Focus/ modify the program
- Identify resource needs
- Meet permit requirements

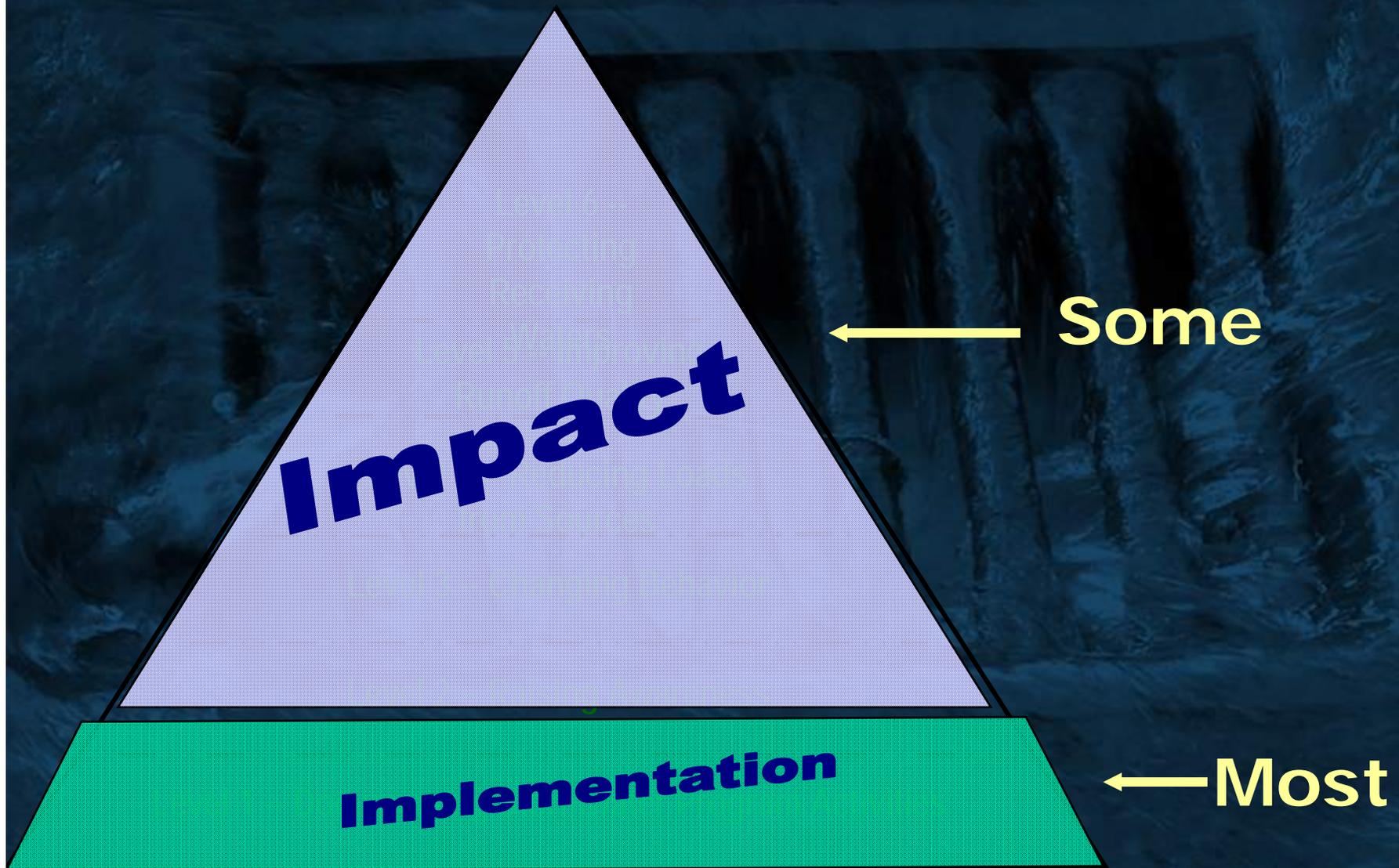
How Can We Adaptively Manage the Programs with Assessment?



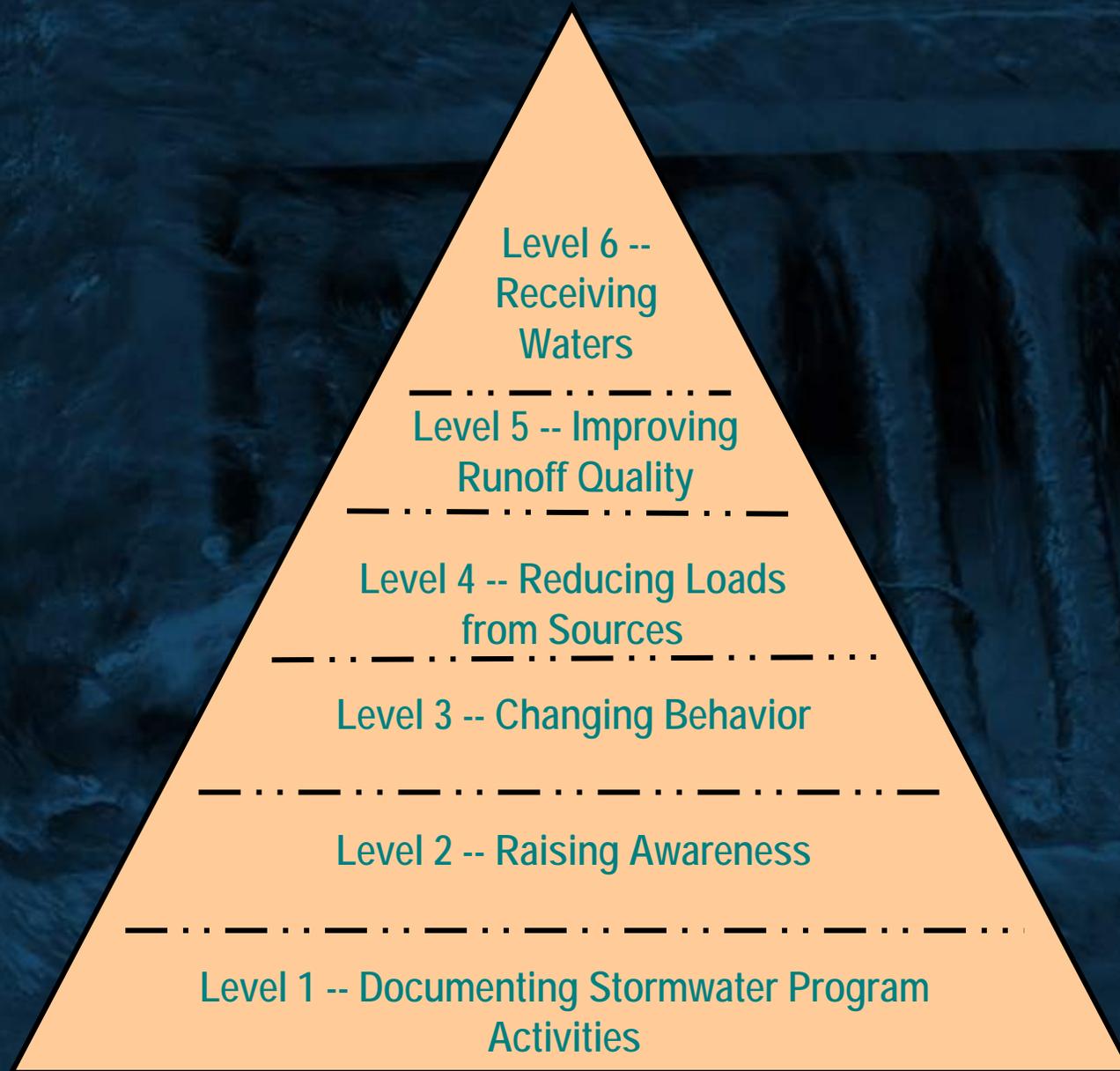
Where are We Now in Adaptively Managing the Programs?



How Do We Currently Assess Effectiveness?



How Can We Assess Effectiveness?



Program
(Levels 5-6)

Element
(Levels 2-5)

Activity
(Levels 1-4)

Not All Outcome Levels Apply

Minimum Control Measure	Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Public Education & Outreach	X	X	X			
Public Participation/ Involvement	X	X	X			
Illicit Discharge Detection and Elimination	X	X	X			
Construction Site Runoff	X	?	X	X		
Post-Construction Runoff Control	X	?	X	X		
Pollution Prevention/ Housekeeping	X	X	X	X		

Effectiveness Assessment Strategy

- Determining Assessment Focus
- Determining Baseline Condition
- Selecting Assessment Method(s)
- Using the information

Assessment Focus

- Is the activity being implemented (Level 1)?
- Does the activity/element raise awareness (Level 2)?
- Does the activity/element change behavior (Level 3)?
- Does the activity/element reduce loads from sources (Level 4)?
- Does the element/program result in improved runoff quality (Level 5)?
- Has a measurable change been observed in receiving waters (Level 6)?

Establishing Assessment Focus

- What are you trying to achieve?

Goal

- Where are you starting from?

Baseline

- How will you know if the goal has been achieved?

Target

- What is the desired outcome?

Outcome Level

Example Goals, Targets, and Outcome Levels

Goal	Target	Outcome Level
Increase the implementation of proper protocols for storm drain cleaning.	All storm drains are inspected and cleaned	1
Decrease chemical use for landscape maintenance.	Decrease pesticide use by 20% in targeted locations	3

Effectiveness Assessment Strategy

- Determining Assessment Focus
- Determining Baseline Condition
- Selecting Assessment Method(s)
- Using the information

Example Baseline Information

- What have we done - what do we know? (Level 1)
- Is the target audience aware – did they change behavior? (Level 2)
- Can we use a past survey? (Levels 2, 3)
- Do we have baseline monitoring data? (Levels 4, 5, 6)

Effectiveness Assessment Strategy

- Determining Assessment Focus
- Determining Baseline Condition
- Selecting Assessment Method(s)
- Using the information

Selecting Assessment Methods

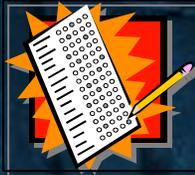
- Confirmation



- Tabulation



- Surveys



- Inspections/
Observation



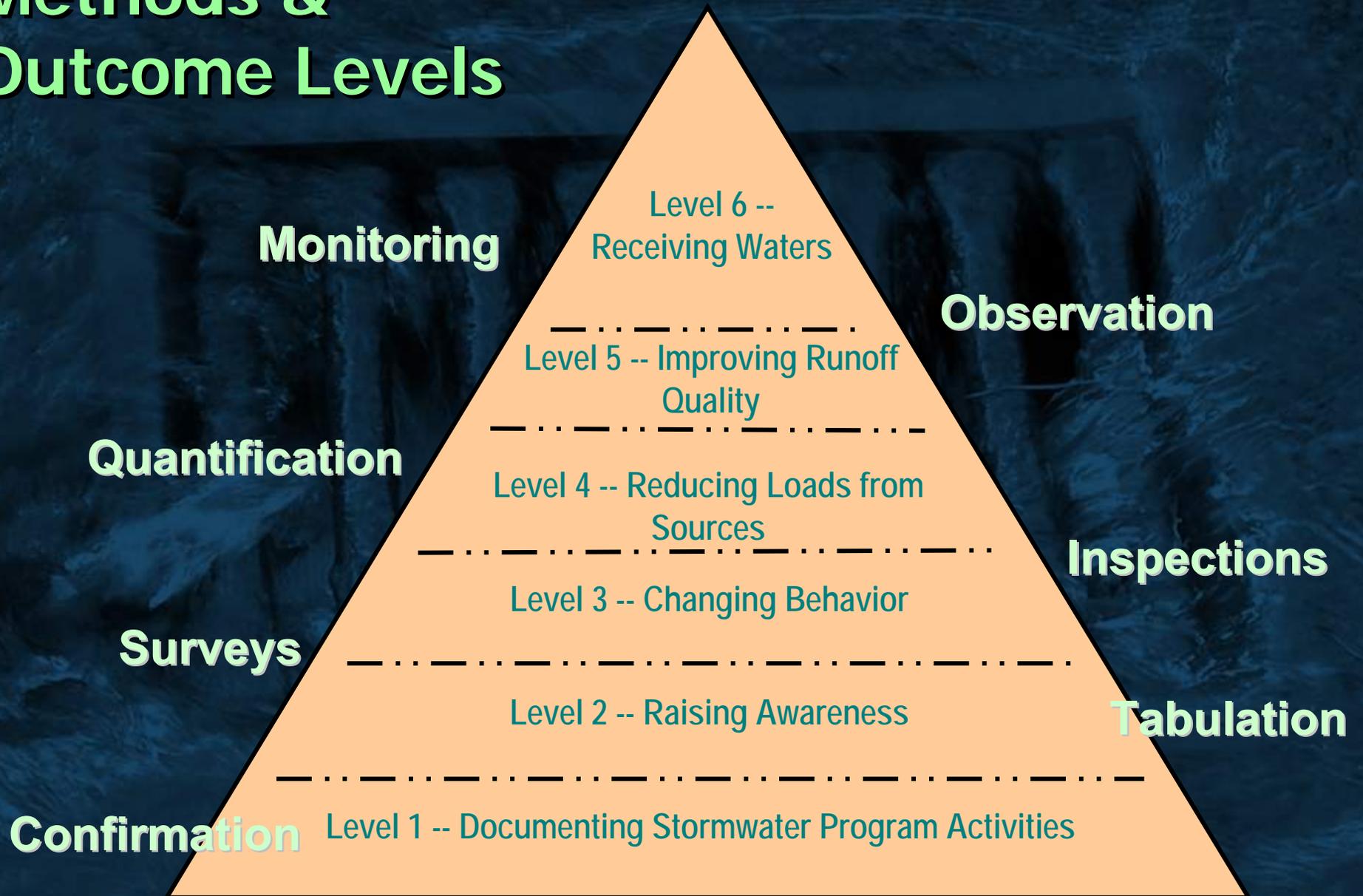
- Quantification



- Monitoring



Methods & Outcome Levels



Example - Setting a target/ Selecting a method

- Goal: Reduce pesticide use.

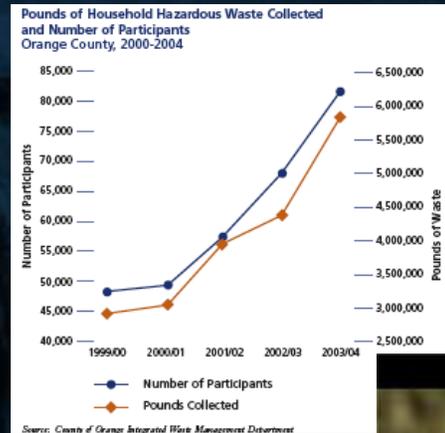
Target	Data Collected	Assessment Method
Use protocols to reduce pesticide use by municipal staff by 50%	Pounds of pesticide active ingredient used	Tabulation Quantification
Conduct outreach to reduce pesticide use by residents by 10%	Reported Use Shelf survey, sales tracking	Surveys Tabulation

Effectiveness Assessment Strategy

- Determining Assessment Focus
- Determining Baseline Condition
- Selecting Assessment Method(s)
- Using the information

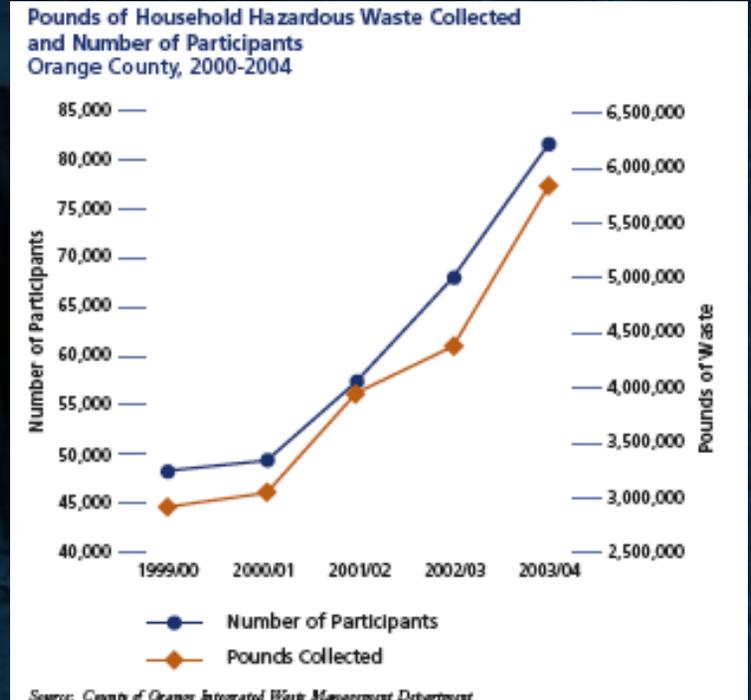
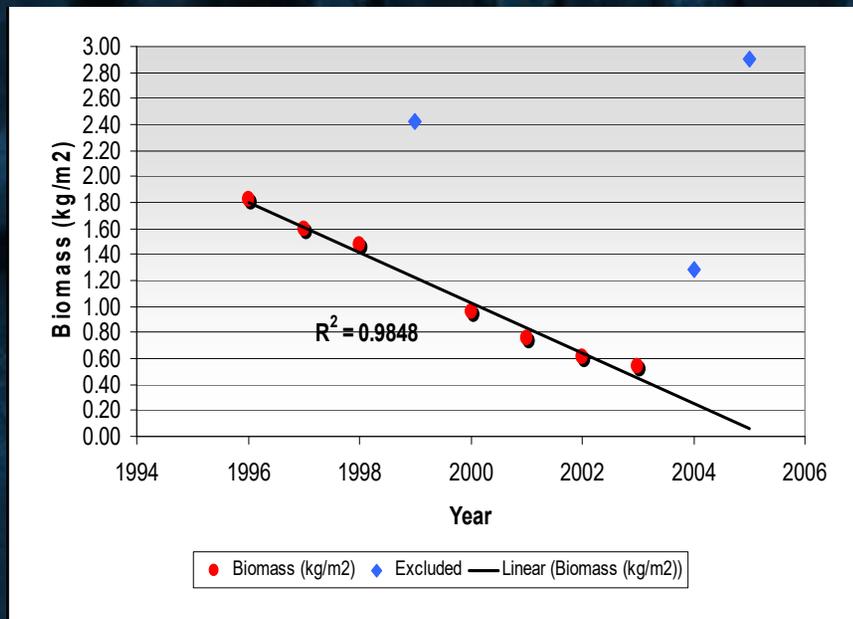
Using the information

- Data analysis
- Future planning
- Reporting & communicating

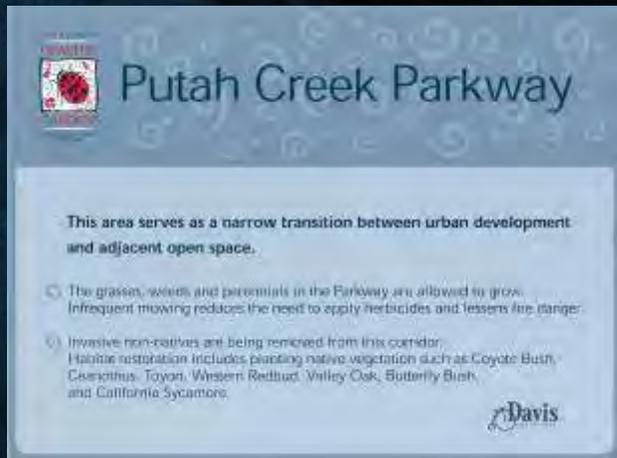


Using the information

- Data analysis
 - Observed changes
 - Trends
 - Quantitative analysis



Interpreting Data for Future Planning



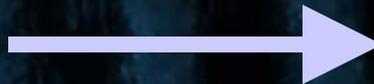
Putah Creek Parkway

This area serves as a narrow transition between urban development and adjacent open space.

- The grasses, weeds and perennials in the Parkway are allowed to grow. Infrequent mowing reduces the need to apply herbicides and lessens fire danger.
- Invasive non-natives are being removed from this corridor. Habitat restoration includes planting native vegetation such as Coyote Bush, Ceanothus, Toyon, Western Redbud, Valley Oak, Butterfly Bush, and California Sycamore.



• Theatre slides more effective than signs



• Relate message to wetlands

• Move from awareness to behavior change



My beak is natural. Pesticides are not.

Know your pests before applying pesticides.
Help keep our ponds and wetlands healthy.

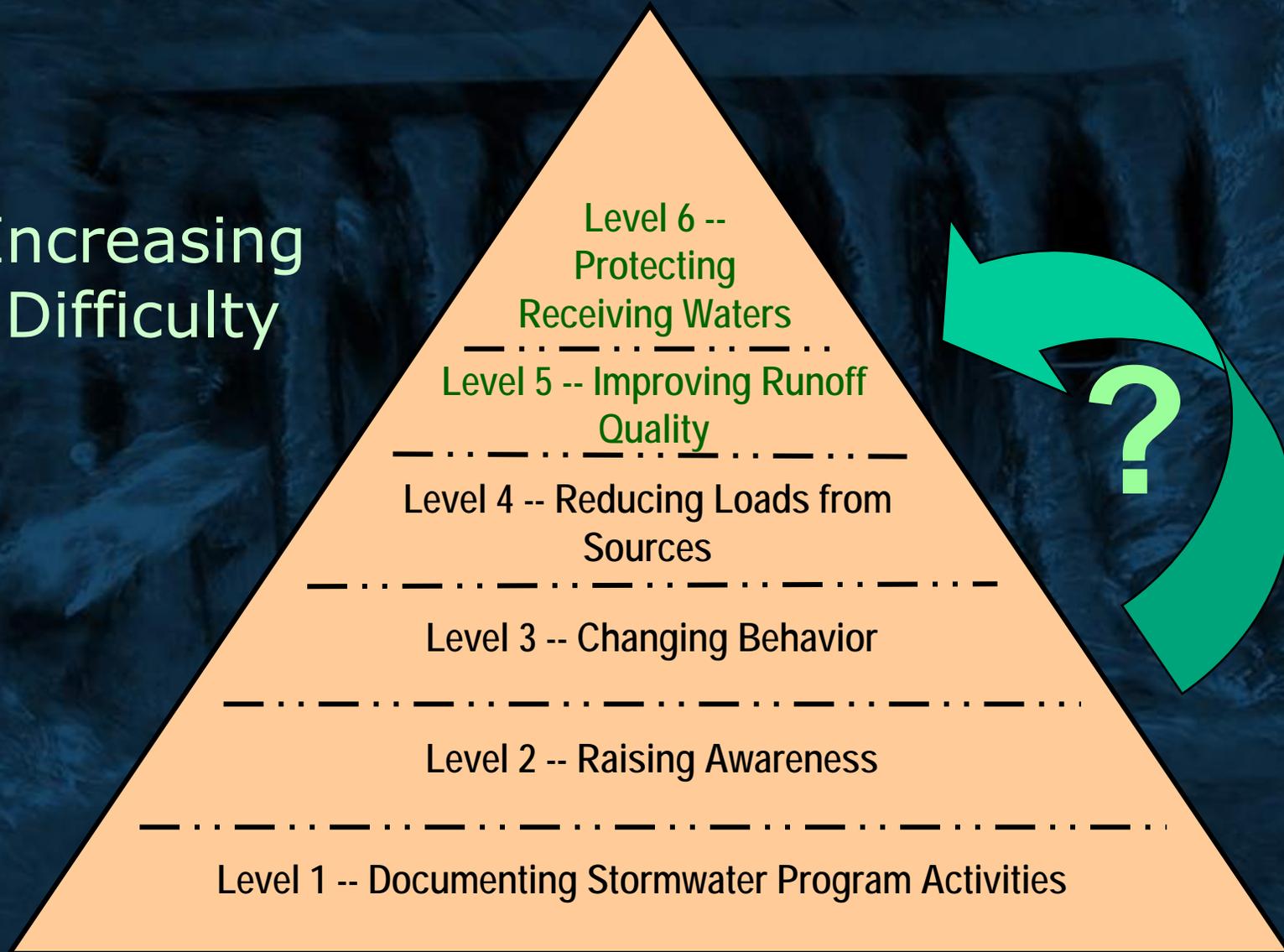
 For free pesticide management guide, call 757-5586 or www.city.davis.ca.us

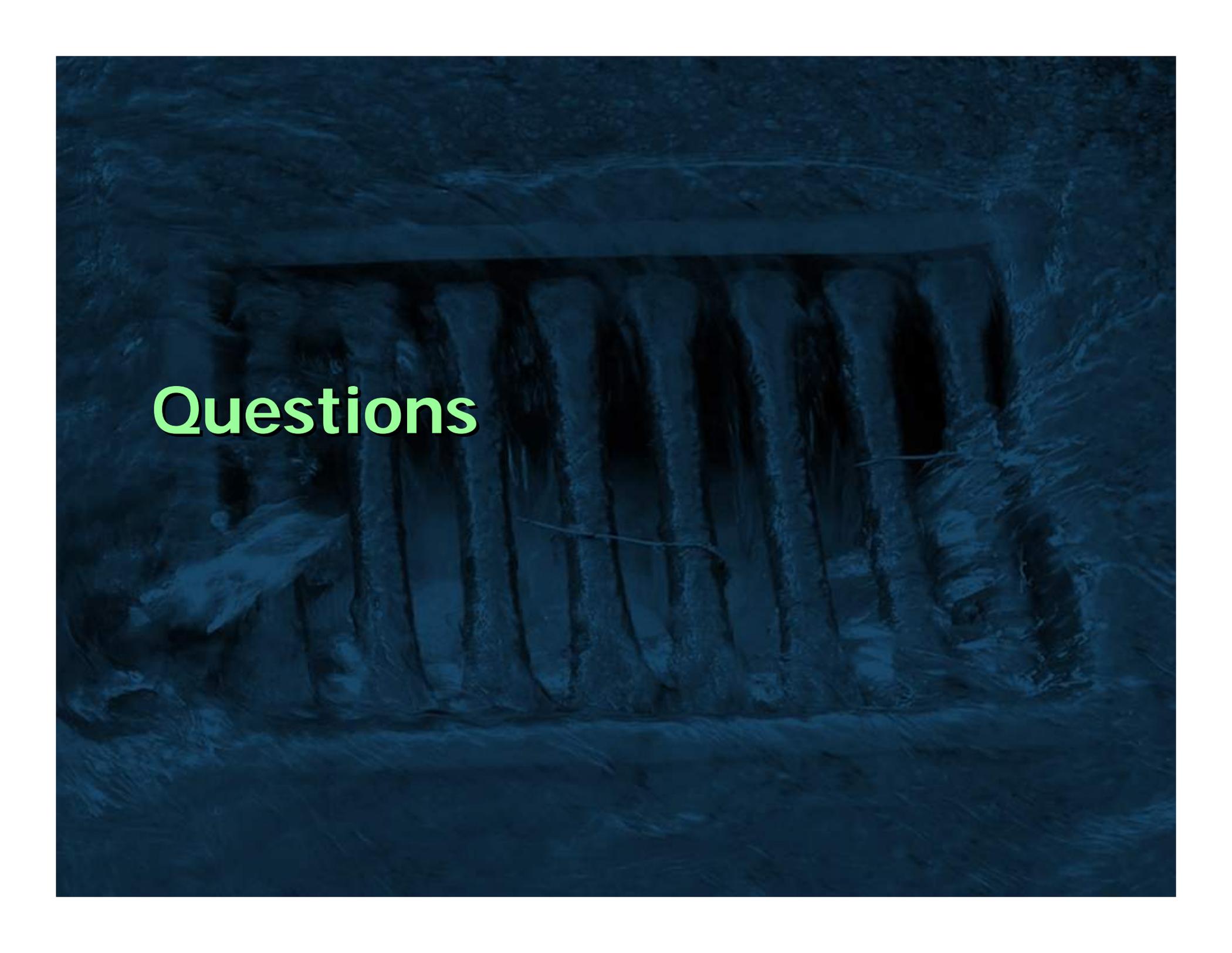


Overall Program and Water Quality Assessment

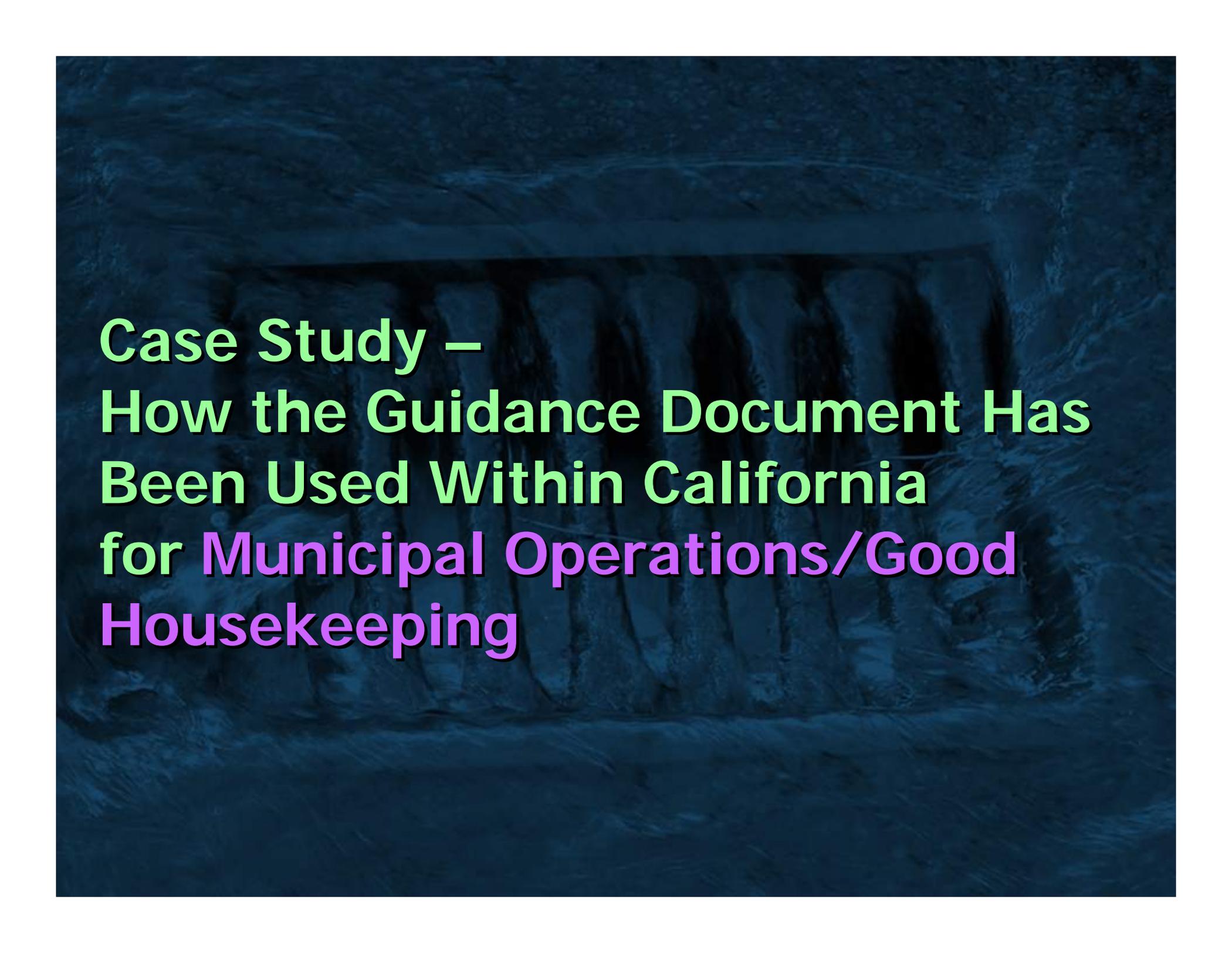


Increasing
Difficulty





Questions



**Case Study –
How the Guidance Document Has
Been Used Within California
for Municipal Operations/Good
Housekeeping**

Document Identifies How the Concepts Apply to Each Program Element/MCM

Municipal Operations Program Element



Applicable Outcome Levels	
Level 1 – Documenting Activities	X
Level 2 – Raising Awareness	X
Level 3 – Changing Behavior	X
Level 4 – Reducing Loads from Sources	X
Level 5 – Improving Runoff Quality	*
Level 6 – Protecting Receiving Water Quality	*

*Levels 5 & 6 discussed in Section 6

Identifies Example Goals Outcomes

Outcome Level	Goal	Example Outcomes
1 – Documenting Activities	Program development and implementation and basic compliance with the NPDES permit requirements.	<ul style="list-style-type: none"> • Perform street sweeping at a defined frequency and coverage • # of storm drain inlets cleaned • # of responses to complaints/ flood notifications
2 – Raising Awareness	Raise a target audience's awareness and understanding of an issue	<ul style="list-style-type: none"> • Develop a Facility Pollution Prevention Plan (FPPP) for Corporation Yard • % field maintenance staff who understood training concepts
3 – Changing Behavior	Change a target audience's behavior which results in the implementation of recommended BMPs	<ul style="list-style-type: none"> • Implementation of FPPP at corporation yard. • Proper handling and disposal of street sweeping waste.
4 – Reducing Loads from Sources	Reduce the load of pollutants from sources <u>to</u> the storm drain system	<ul style="list-style-type: none"> • Estimates of pounds of pollutant removed by cleaning of storm drain inlets and sumps • Tons of dry waste removed from street sweeping

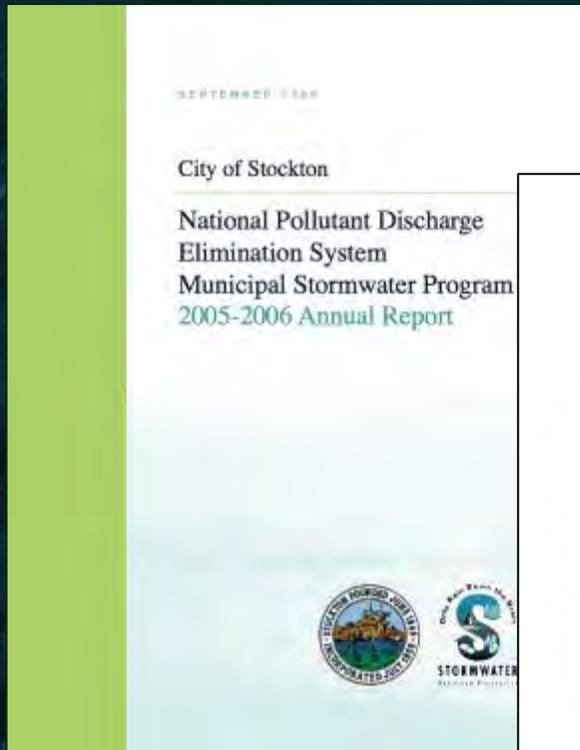
Identifies Example Goals and Targets

Goals	Target	Projected Timeframe
<p>Change a target audience's behavior which results in the implementation of recommended BMPs –</p> <p>Increase the implementation of proper protocols for storm drain cleaning.</p>	<p>All (or some feasible annual percentage) storm drains are inspected and cleaned consistent with prioritized schedule.</p>	<p>Within 2 years</p>
<p>Reduce the load of pollutants from sources <u>to</u> the storm drain system –</p> <p>Decrease chemical use for landscape maintenance.</p>	<p>Decrease pesticide use by 20% (taking in to account weather patterns and other factors) in targeted locations.</p>	<p>Within 3 years</p>

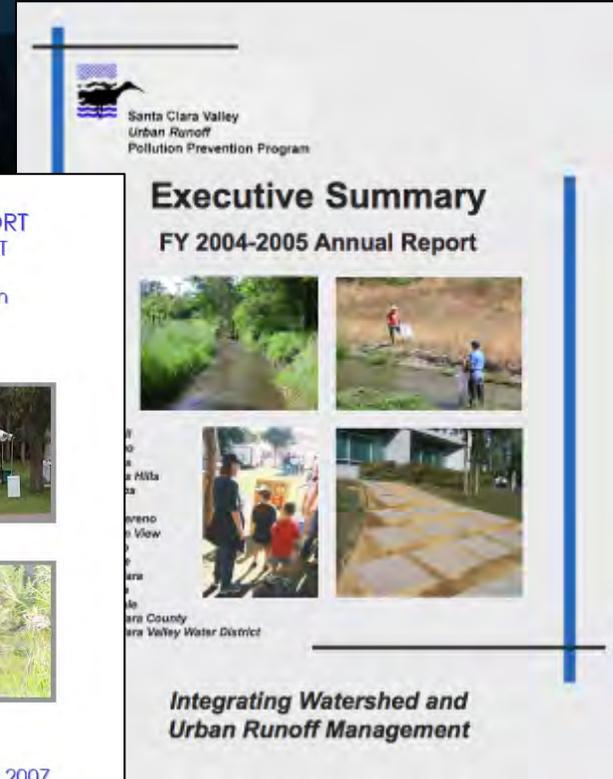
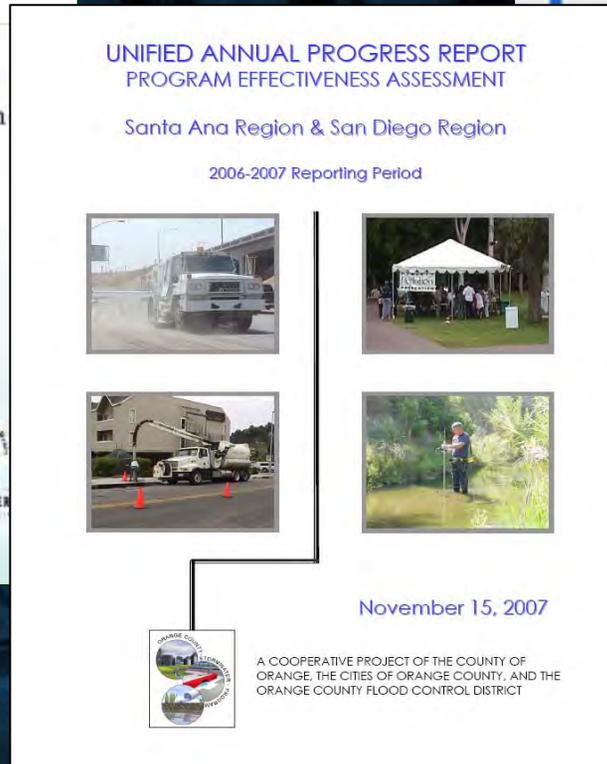
Examples for Reporting

Task	Data Collected	Outcome Level	Assessment Method and Comparison with Goals and Baselines
Storm Drain System Maintenance			
Inventory drainage system (by drainage area or sub-watershed)	Develop inventory/map of drainage system. Identify the location and size of drainage system including catch basins, pump stations, detention basins, etc.	1	Confirmation <ul style="list-style-type: none"> Identify that the inventory was developed Tabulation <ul style="list-style-type: none"> Identify total # catch basins and number directly draining to receiving water Provide map of drainage system
	Compile cleaning records for drainage system	1	
Develop and implement cleaning schedule and protocols	Develop protocols for cleaning	1-2	Confirmation <ul style="list-style-type: none"> Identify that protocols were developed Tabulation/Quantification <ul style="list-style-type: none"> # cleaned and estimate of waste removed.
	Number of catch basins, drain pipe, pump stations, etc. cleaned	2 – 4	

Some MS4s Are Already Using the Guidance Document

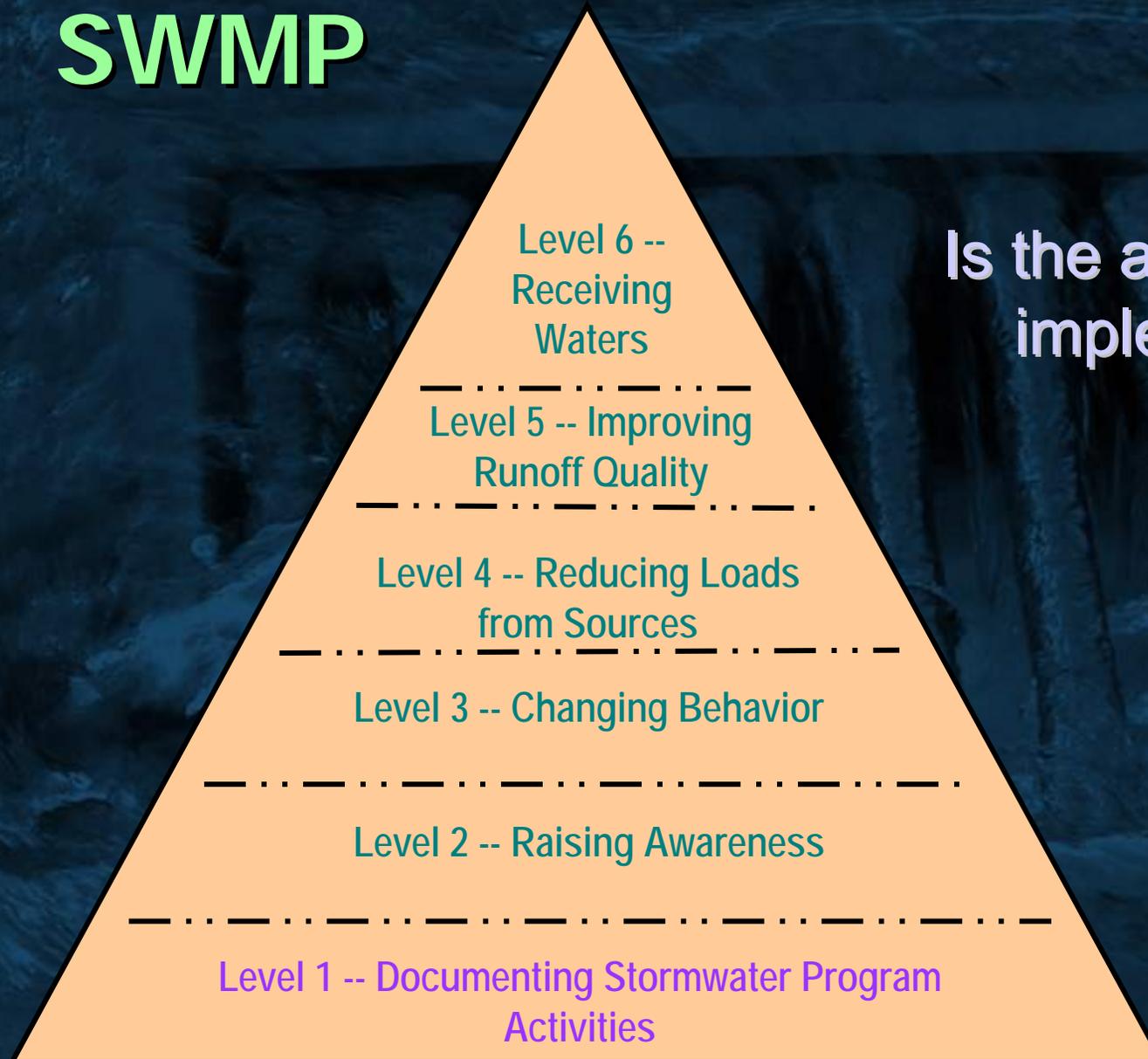


City and County of San Diego



Some Phase II MS4s

Outcome Levels and the SWMP



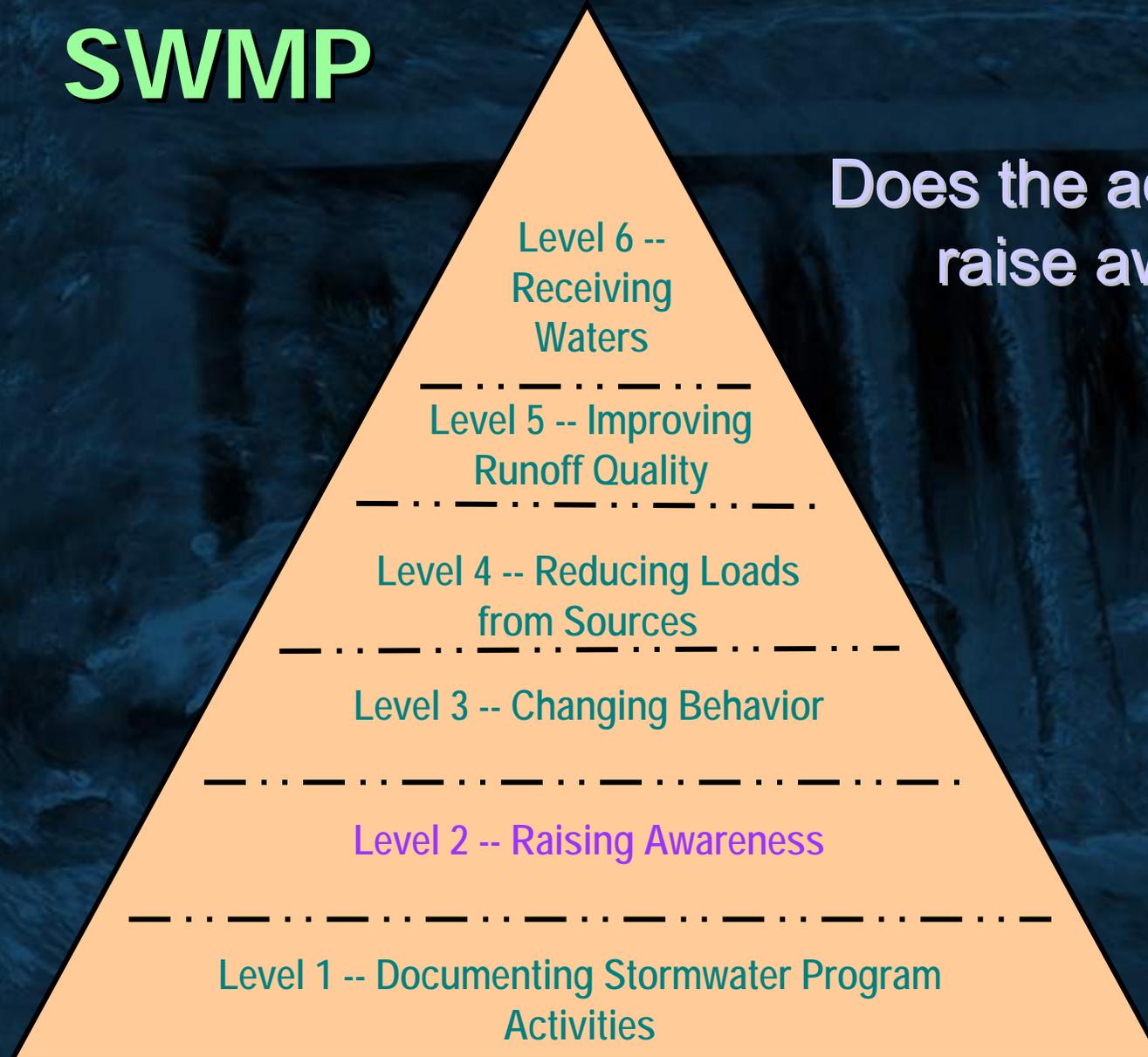
Is the activity being implemented?

Examples – Outcome Level 1

- Stenciled/marked catch basins
- Developed inspection forms
- Prioritized catch basins
- Annually inspected and cleaned catch basins

Source Type	Activity	Targeted Outcome	Measures of Success			
			Target	Actual	% Completion	Completion (Yes / No)
1. Roads, Streets, Highways, and Bridges	Inventory update	Task completion	---	---	---	Yes
2. MS4	Inventory conversion to GIS	Conversion of culverts (multi-year target)	100%	95%	---	---
3. Fixed Municipal Facilities	Inventory update	Task completion	---	---	---	Yes
4. Roads, Streets, and Highways	Sweeping	Streets swept (miles)	11,354	14,615	129%	---
5. MS4	Cleaning	Conveyances cleaned	15,540	16,402	106%	---
6. MS4	Stenciling	Inlets stenciled	137	137	100%	---
7. Municipal Employees	Basic Awareness Training	Employees trained	3,400	>18,000	100%	---
8. Municipal Employees	Focused Training	Employees trained	1,170	1,046	90%	---

Outcome Levels and the SWMP



Does the activity/element raise awareness?

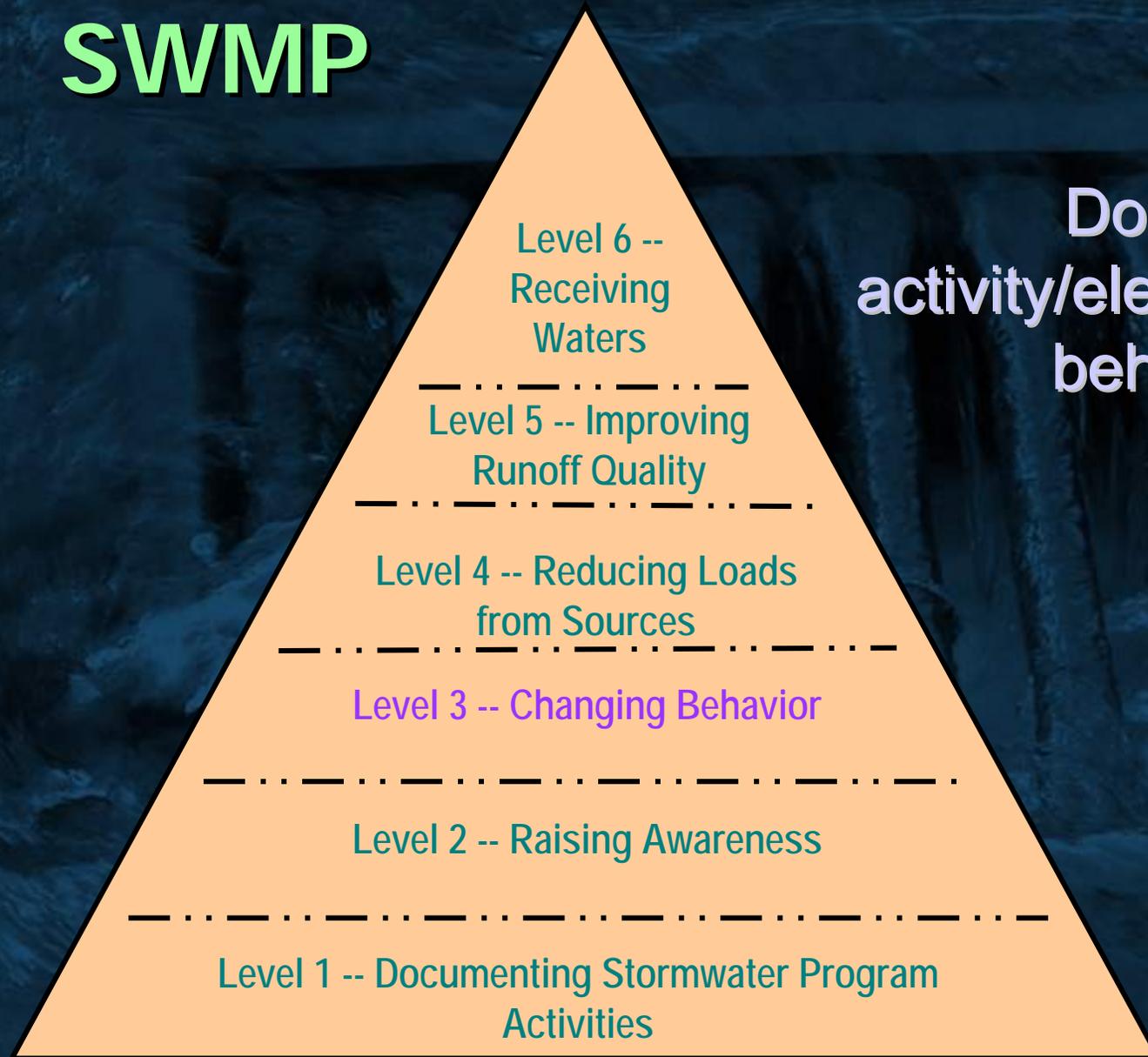
Example – Outcome Level 2

- Primarily achieved with training
- Recognize that Level 3 supports if Level 2 is achieved

Model IPM and Fertilizer Guidelines	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
Model IPM	✓ Formal Policy		✓ Reduction in pesticide use			
Fertilizer Guidelines	Ⓜ Formal Policy		✓ Reduction in fertilizer use			
Training	✓ Track number/type of training sessions	Ⓜ Surveys show improved knowledge				

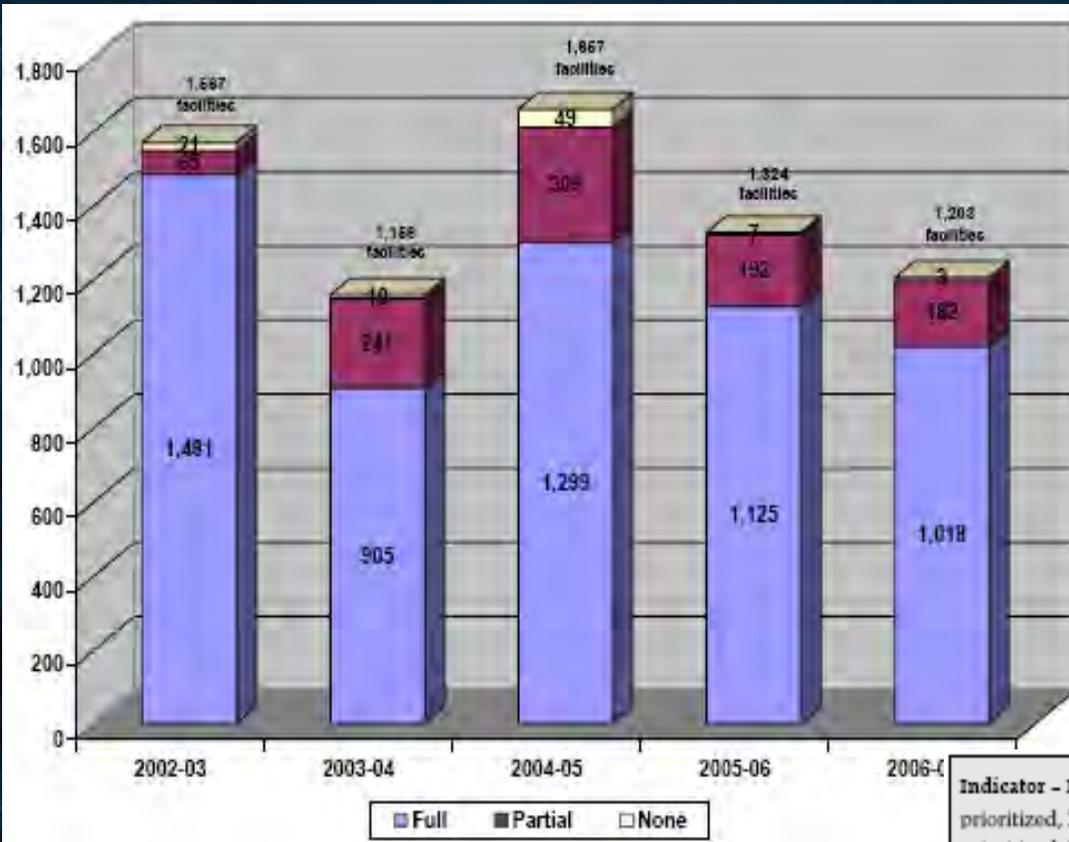
Key:
 ✓ = Currently Achieved Outcome Level
 Ⓜ = Potentially Achievable Outcome Level

Outcome Levels and the SWMP



Does the activity/element change behavior?

Example – Outcome Level 3



Evaluate BMP implementation at facilities

Indicator - Prioritization of Facilities: For 2006-07 1,203 municipal facilities were prioritized, 25% of which were high priority. In 2005-06 1,324 municipal facilities were prioritized, 27% of which were high priority; for 2004-05, 1,652 facilities were prioritized, 25% of which were ranked as high priority; for 2003-04, 1,156 facilities were prioritized, 29% of which were ranked as high priority; and for 2002-03, 1,587 facilities were prioritized, 26% of which were ranked as high priority (Table C-5.1 and Figure C-5.1).

- Level 1: Documenting Stormwater Program Activities
- Level 3: Changing Behavior

Outcome Levels and the SWMP

Does the activity/element reduce loads from sources?

Level 6 --
Receiving
Waters

Level 5 -- Improving
Runoff Quality

Level 4 -- Reducing Loads
from Sources

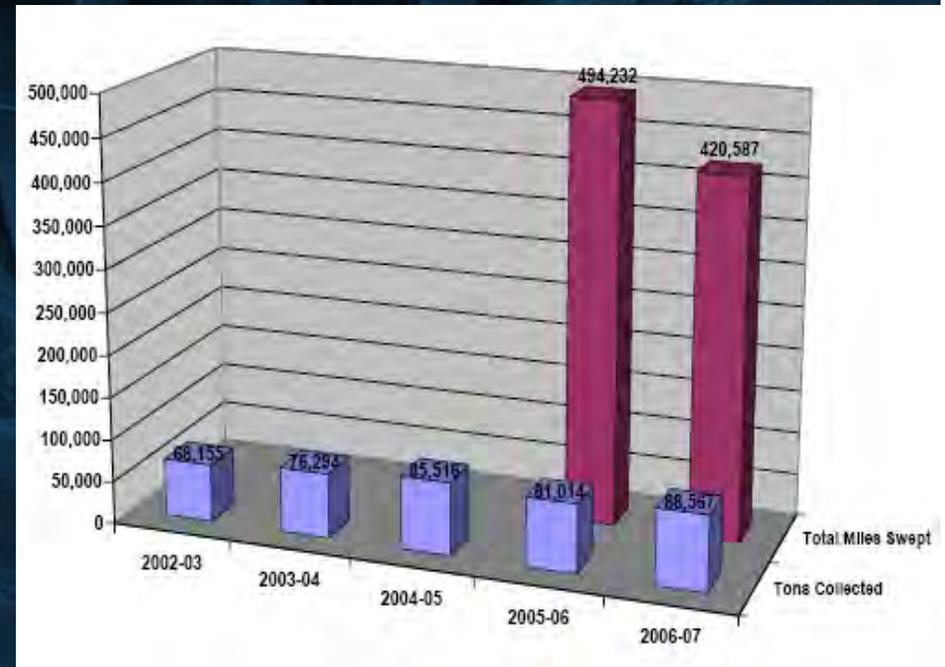
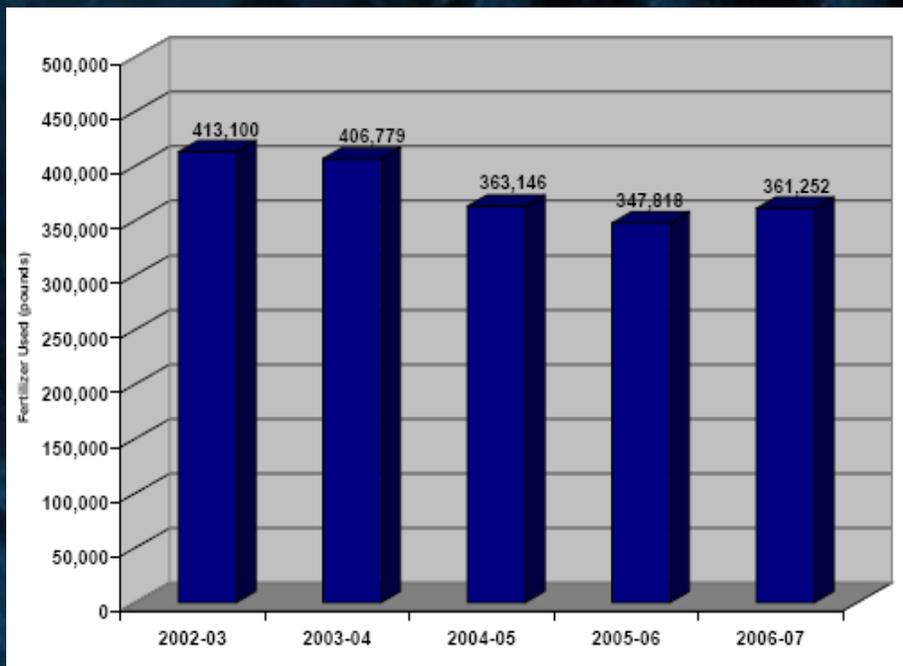
Level 3 -- Changing Behavior

Level 2 -- Raising Awareness

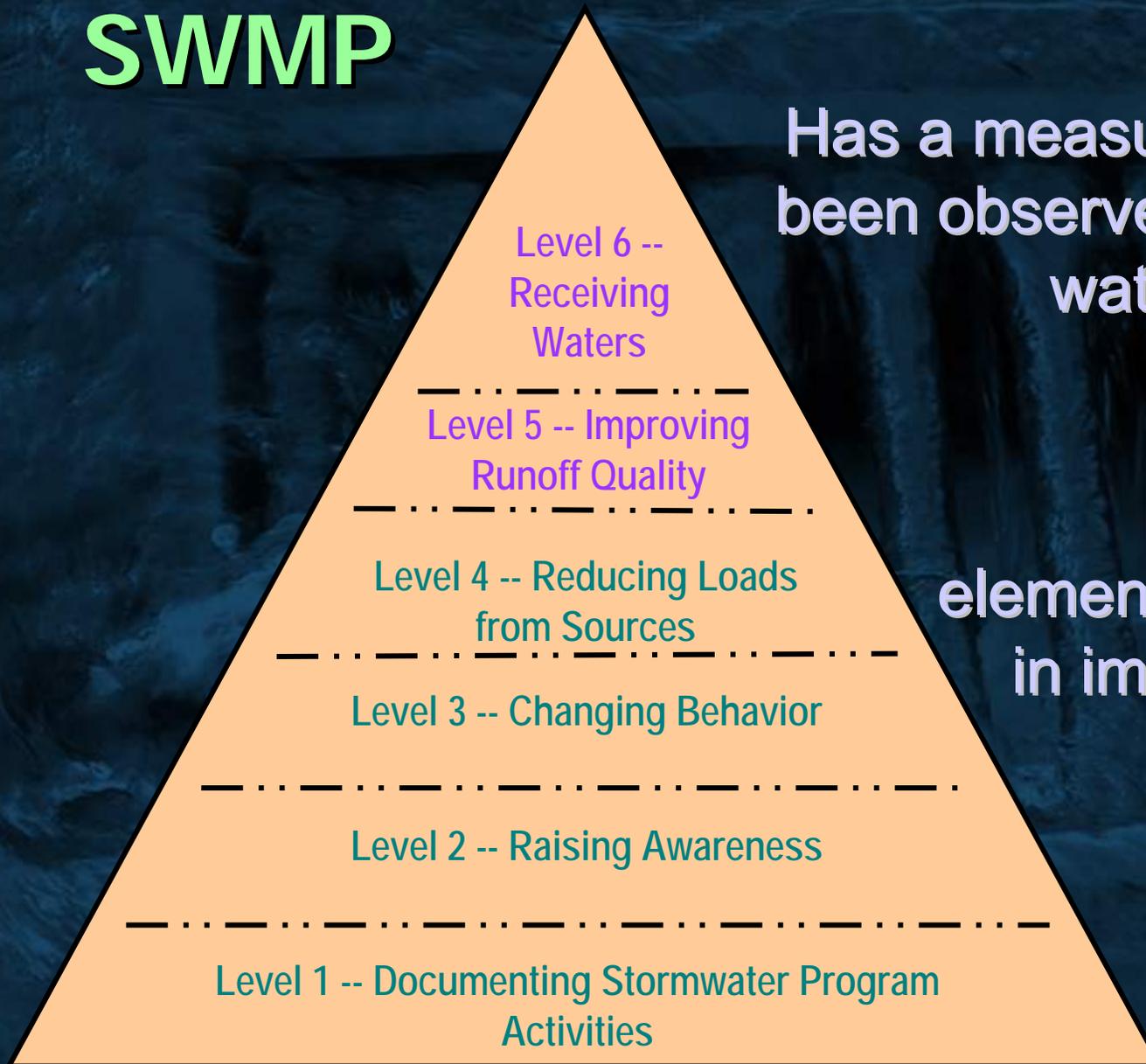
Level 1 -- Documenting Stormwater Program
Activities

Example – Outcome Level 4

- Fertilizer Application
- Street Sweeping



Outcome Levels and the SWMP



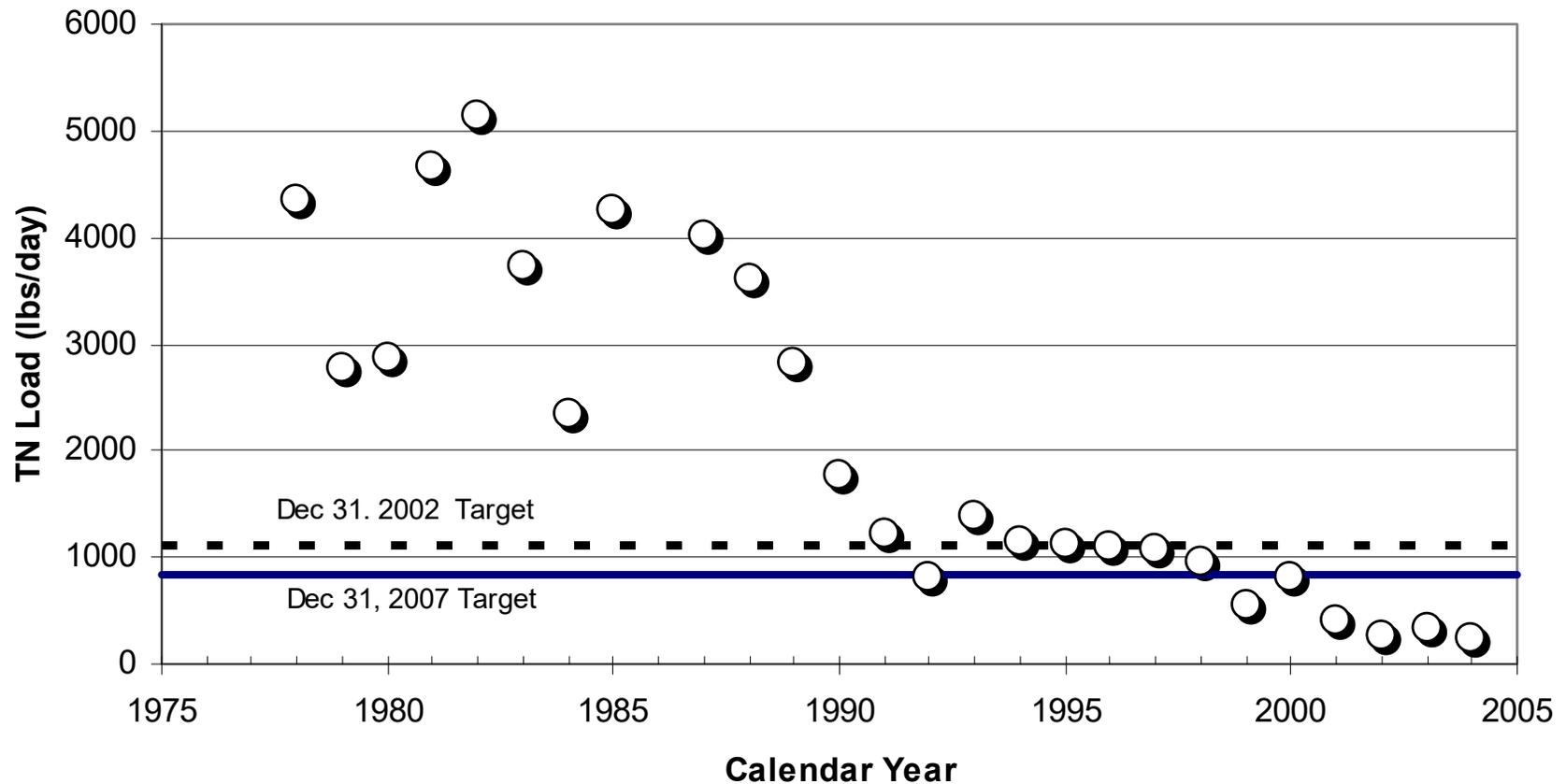
Has a measurable change been observed in receiving waters?

Does the element/program result in improved runoff quality?

Example – Outcome Level 6

Newport Bay Nutrient Reduction

Average Summertime TN Load from San Diego Creek



Visual Progress (Site 7)

1997



2007



Using the Information

4.13 Municipal Operations Program Modifications

The City evaluates the results of the annual progress report assessments as well as the experience that staff has had in implementing the program and determines if any program modifications are necessary in order to comply with Clean Water Act requirements to reduce the discharge of pollutants to the maximum extent practicable.

At this time, no major modifications are anticipated for the Municipal Operations Program during the next fiscal year.

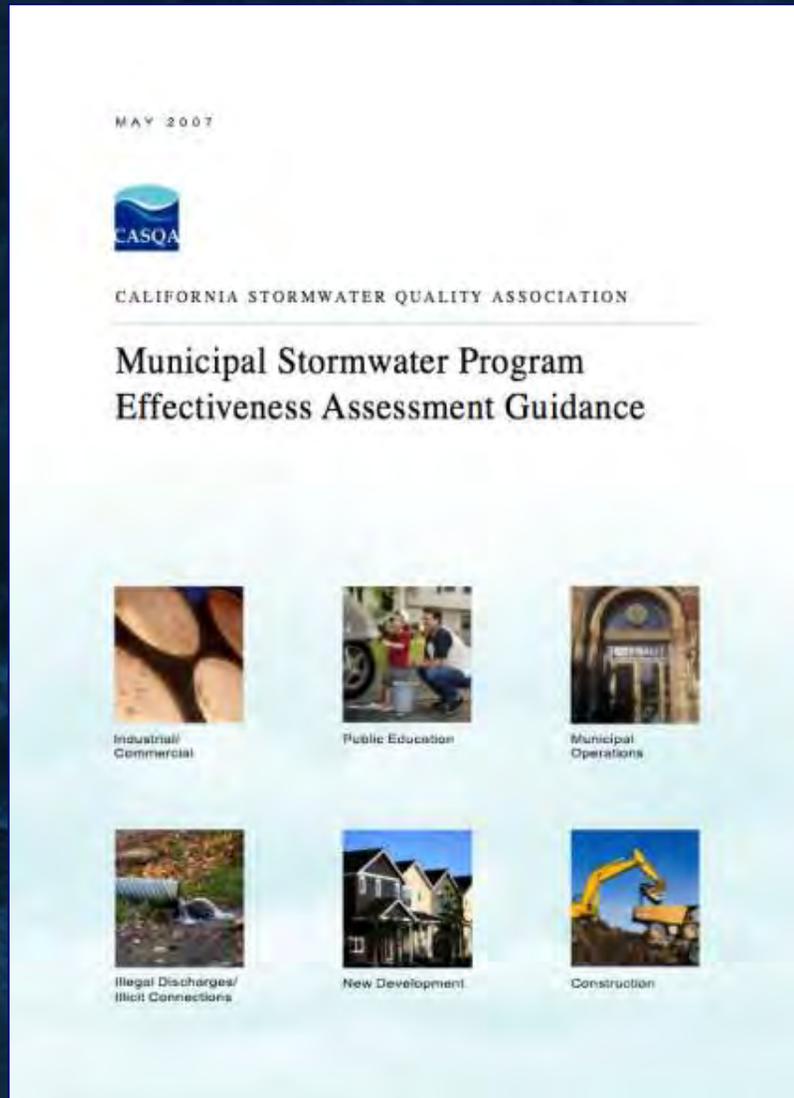
Proposed Program Modification (in ROWD):

- **Develop Model Integrated Pest Management, Pesticide and Fertilizer Guidelines into a Model Program (rather than guidelines) with implementation goals and including model contract language.**
- **Redefine IPM (pesticide use) indicators.**

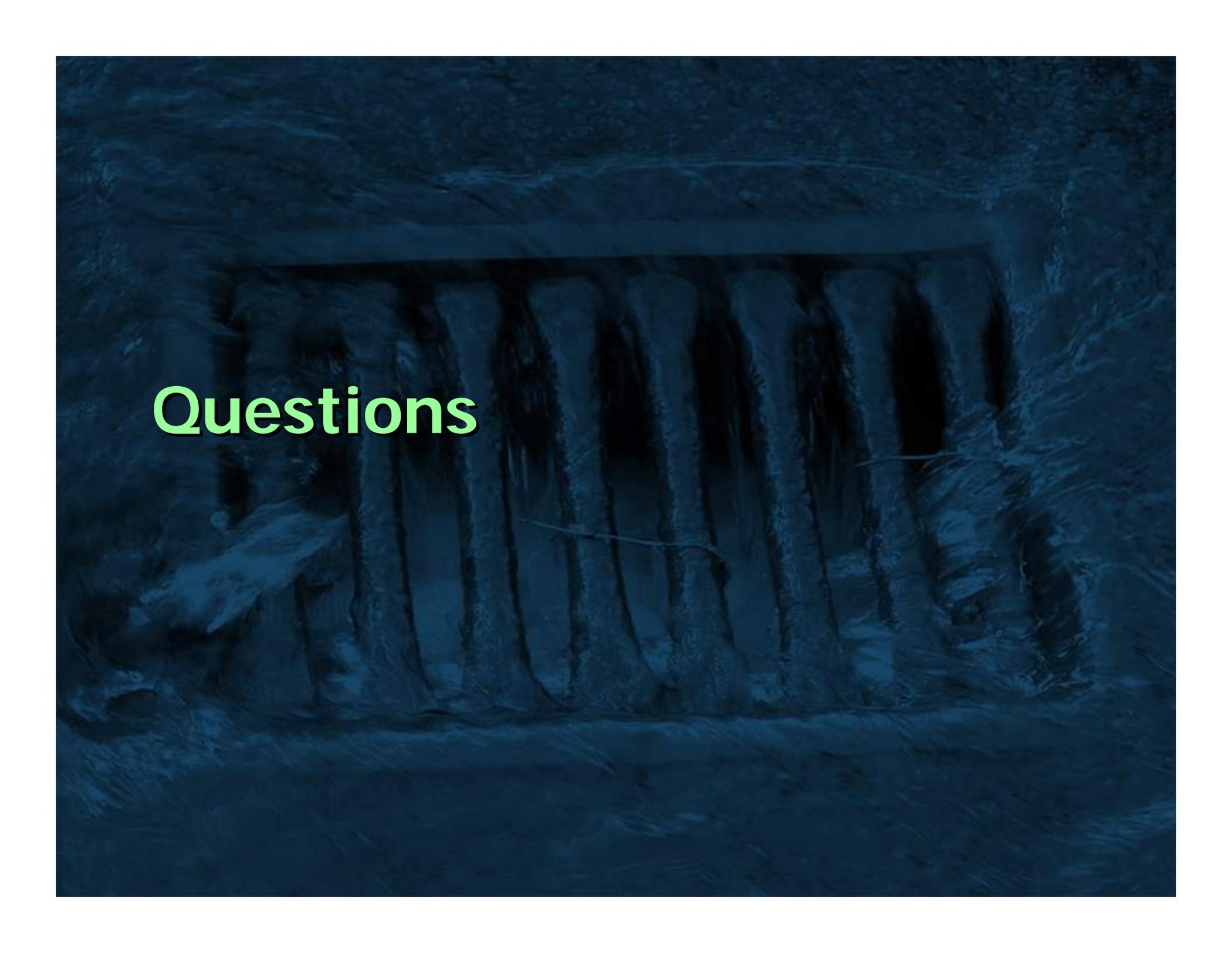
In Summary....

- Guidance Document is one approach for demonstrating effectiveness
- Assists in completing the iterative process
- Evaluates activities and impacts of program
- Can demonstrate intermediary progress towards program goals
- Approach is still evolving – stay tuned

CASQA Guidance Manual



For More
Information:
www.casqa.org



Questions

Next Stormwater Webcast

Stormwater 101

July 23, 2008 12:00 – 2:00
Eastern

Participation Certificate

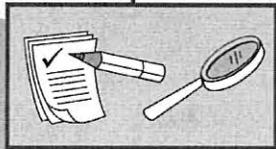
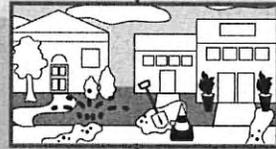
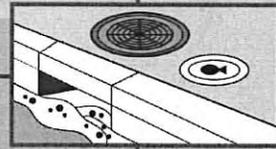
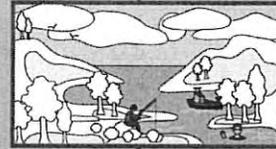
- If you would like to obtain participation certificates for multiple attendees, click the link below
- You can type each of the attendees names in and print the certificates

www.epa.gov/npdes/webcasts/certificate/effective_municipal.pdf

ATTACHMENT 61

A Strategic Approach to

Planning for and Assessing the Effectiveness of Stormwater Programs



CALIFORNIA STORMWATER
QUALITY ASSOCIATION

February 2015

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**A Strategic Approach to Planning for and Assessing the
Effectiveness of Stormwater Programs**

California Stormwater Quality Association

February 2015

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Copyright Statement

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Disclaimer

This document, *A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs* (Guidance Document), is intended to provide specific “how to” guidance with examples for managers to use in planning and assessing their stormwater programs. Users of the Guidance Document should use their professional judgment and assume all liability directly or indirectly arising from the Guidance Document. This disclaimer is applicable whether information from the Guidance Document is obtained in hard copy form or downloaded from the Internet.

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Acknowledgements

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Attachments

- A Glossary of Acronyms and Terms
- B Source Profiles
- C Pollutant Profile Sheets

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Executive Summary

ES.1. Introduction (Section 1)

Municipal Separate Storm Sewer System stormwater programs (MS4 programs) are inherently complex for a variety of reasons.

- They typically address a number of major sources within their area of jurisdiction (construction, development, residential areas, municipal operations, and industrial and commercial facilities) and have to administer the program to tens of thousands to millions of individuals, sites and/or sources.
- Due to the geographic area that the MS4 program covers, the vast number of potential pollutants, and the volumes of flows that must be addressed, the programs tend to predominately focus on the use of source control best management practices (BMPs). While treatment controls are an important part of the MS4 program, managers often find themselves seeking to bring about the broad-scale implementation of many small controls by third parties.
- The flows in an MS4 are transported via both manmade and natural, open systems. The ability to measure, modify, or control MS4 discharges is complicated by the co-mingling of both anthropogenic and natural flows and pollutants within these systems. In addition, MS4s are often impacted by a number of non-point sources such as groundwater seepage, wind-blown and directly-deposited materials, and aerial deposition.

Despite these and other challenges, stormwater program managers find themselves facing increasing pressure to demonstrate the effectiveness of their programs, often with little guidance on how to do so. Without the specific knowledge or the tools needed to do so, stormwater managers can be faced with a perception that their programs are inadequate or failing.

Effectiveness assessment consists of the methods and activities that managers use to evaluate how well their programs are working and to identify modifications necessary to improve results.

The primary purpose of this Guidance Document is to establish specific “how to” guidance with examples for managers in planning and assessing their MS4 programs. It approaches effectiveness assessment as an integral part of a comprehensive strategic planning process. It is designed for use by MS4 program managers involved in developing and implementing all aspects of stormwater programs, but it should also be useful to a variety of dischargers regulated under other stormwater permits and programs (e.g., construction and industrial), as well as other environmental managers with a need for guidance on management and assessment principles.

Executive Summary

A structured approach to planning and assessing stormwater programs can help managers ensure that their programs are properly targeted, determine whether intended results are being efficiently and cost-effectively achieved, relate implementation results to conditions in urban runoff and receiving waters, and, ultimately, help guide managers toward implementation strategies with the greatest opportunity for long-term success.

Table ES.1 provides an overview of the organization of this Guidance Document, and briefly describes the purpose of each section.

Table ES.1: Organization of the Guidance Document

1.0	Introduction and Purpose	Provides background on the development and use of effectiveness assessment methods and their important to stormwater program managers.
2.0	General Concepts and Principles	Introduces the main components of the program planning and assessment processes, describes their use, and defines standardized concepts and terminology used throughout the Guidance Document.
3.0	Introduction to Strategic Planning for Stormwater Management Programs	Describes a stepwise process for developing a Comprehensive Program Planning Strategy, including problem characterization, goal setting, selection of control strategies and program activities, and the establishment of methods and metrics to assess effectiveness.
4.0	Source and Impact Strategies	Applies the strategic planning process introduced in Section 3.0 to the development of Source and Impact Strategies.
5.0	Target Audience Strategies	Applies the strategic planning process introduced in Section 3.0 to the development of Target Audience Strategies.
6.0	Program Implementation Strategies	Applies the strategic planning process introduced in Section 3.0 to the development of Program Implementation Strategies.
7.0	Assessment Tools and Strategies	Applies the strategic planning process introduced in Section 3.0 to the identification of tools and strategies for conducting assessments.
8.0	Interpretation and Use of Results	Provides examples of effectiveness assessments that have been conducted by stormwater programs throughout the state.
Att. A	Glossary of Acronyms and Terms	Defines key acronyms and terms used throughout the document.
Att. B	Source Profiles	Provides additional background information on the following source categories: construction, industrial, commercial, municipal operations, and planning and land development.
Att. C	Constituent Profiles	Provides additional background information on the following common constituents: bacteria, sediment, nutrients, mercury, pesticides, and trash.

Executive Summary

ES.2. Stormwater Management Approach (Section 2.0)

This section describes the primary components of a comprehensive Stormwater Management Approach. Within these components, six types of Outcome Levels are introduced. Outcomes are the backbone of the strategic planning and assessment processes described in this document. They provide the structure and measurability needed to evaluate and improve Stormwater Management Programs over time.

For the purposes of this document, stormwater management consists of three primary components:

- **Sources and Impacts** - the physical component of the management approach, i.e., it deals with the generation, transport, and fate of pollutants and flows from the urban environment (Outcome Levels 6, 5, and 4).
- **Target Audiences** - the behavioral portion of the management approach i.e., the actions of target audiences and the factors that influence them (Outcome Levels 3 and 2).
- **Stormwater Management Programs** - the various activities that are conducted within a program (Outcome Level 1).

Starting with Level 1 (Program Activities) and moving sequentially toward Level 6 (Receiving Water Conditions), they represent a general progression of conditions that are assumed to be related in a sequence of causal relationships. While it may initially seem counterintuitive, managers will normally address the six Outcome Levels in “reverse order”

Outcomes are measurable endpoints associated with programs, people, and physical systems. They are the building blocks of the management approach described in this document.

(from Level 6 to Level 1) during planning and assessment (**Figure ES.1**). The reason for this is that, in practice, they must work backwards from measured or observed effects to try and establish their causes. **Figure ES.2** illustrates the general relationship of the three stormwater management program components listed above and the six different Outcome Levels associated with them.



Figure ES.1: The “Counterintuitive” Order of Planning and Assessment Activities

Executive Summary

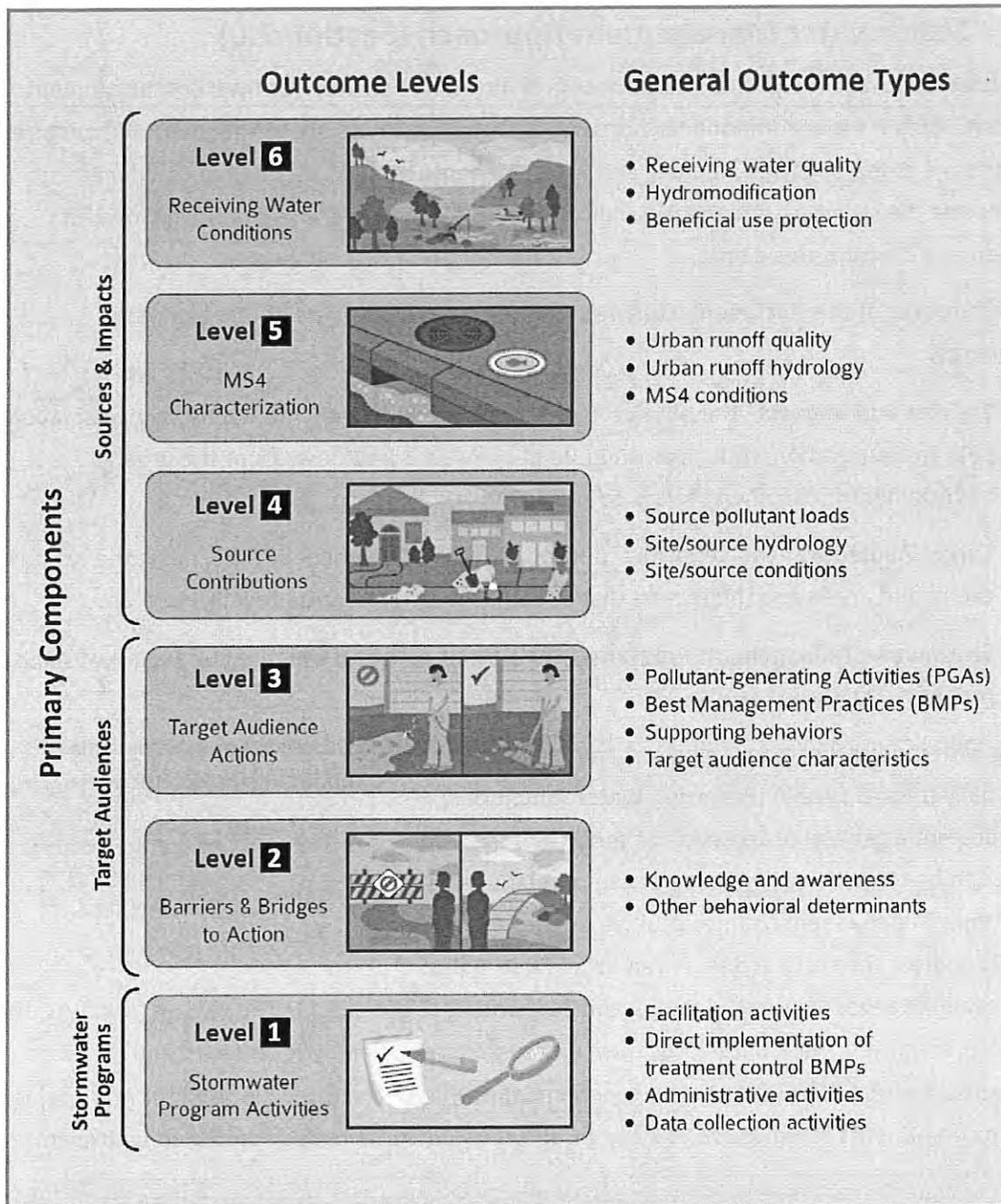


Figure ES.2: General Stormwater Management Model

This section walks the reader through each of the six individual Outcome Levels (shown in Figure ES.2) within the context of each of the primary components (**Sources and Impacts, Target Audiences, and Stormwater Management Programs**). This assists in understanding each Outcome Level both individually and in relation to the others that are influenced by it. This is critical in order for the Program to be measurable and effective in the long term.

Executive Summary

ES.3. Introduction to Strategic Planning for Stormwater Management Programs (Section 3.0)

This section applies the concepts and principles described in Section 2 to the development of a **Stormwater Strategic Plan** that will guide the development and implementation of specific stormwater management plans and programs, and establish a basis for evaluating and updating them. Strategic planning for stormwater managers is best thought of as “strategic problem solving.” Managers will identify and prioritize the problems to be addressed by their programs and develop strategies for resolving them. The general planning process described in this section provides the basis for the more detailed guidance described in the remainder of the document.

Development of a Stormwater Strategic Plan is divided into three distinct stages.

- **Planning Preparation (Stage 1)** - managers establish the basic organizational framework necessary to compartmentalize and make sense of the detailed planning tasks that follow (Section 3.2). This consists of the following steps:
 - Establishing the Strategic Plan Framework
 - Compiling Data and Information
- During **Strategic Planning (Stage 2)**, managers identify and prioritize problems to be addressed, identify specific goals for resolving them, and identify program activities needed to drive and evaluate these changes (Section 3.3).
 - **Figure ES.3** illustrates the core elements of a comprehensive strategic planning process for stormwater management programs.
 - In **Step A**, existing conditions (or outcomes) are evaluated, first very broadly and then in detail, to determine which of them constitute problems potentially requiring a management response. The tasks involved in completing this step are illustrated in **Figure ES.4**.

A **Stormwater Strategic Plan (SSP)** helps guide the development and modification of a **Stormwater Management Plan (SWMP)**. The purpose of the SSP is to systematically explore and define the strategies that will be considered and incorporated as a part of a SWMP, and to suggest how program managers might choose some options over others. In some cases, a SSP may be equivalent to, or part of, a SWMP. In others, it may constitute a separate planning document that informs SWMP development. The SSP will also meet the requirements in the Small MS4 permit for the development of a Program Effectiveness Assessment and Improvement Plan (PEAIP).

Executive Summary

- In **Step B** priority problem conditions are reviewed to determine the types of changes that will be sought and to establish timelines for achieving them. The tasks involved in completing this step are illustrated in **Figure ES.5**.
- **Step C** identifies and documents knowledge and data deficits. While this is shown as a discrete step in Figure ES.3, it's actually an integral part of the entire planning process. The tasks involved in completing this step are illustrated in **Figure ES.6**.
- **Figure ES.7** lays out the entire process for all Stormwater Management Program Components from beginning to end and identifies the sections of this document in which individual planning elements are addressed in greater detail.
- **Strategic Plan Completion (Stage 3)** provides a roadmap to guide program implementation and evaluation (Section 3.4). All Stormwater Strategic Plans will be different depending on their unique needs and circumstances, but each of the following elements should be considered for potential inclusion:
 - Source and Impact Strategies
 - Target Audience Strategies
 - Program Implementation Strategies
 - Assessment Tools and Strategies

Completing this comprehensive process will often require that a wide range of data and information be considered, sometimes beyond explicit regulatory requirements. The purpose of this process is not to create additional requirements, rather it is designed to help managers more effectively and efficiently meet existing ones.

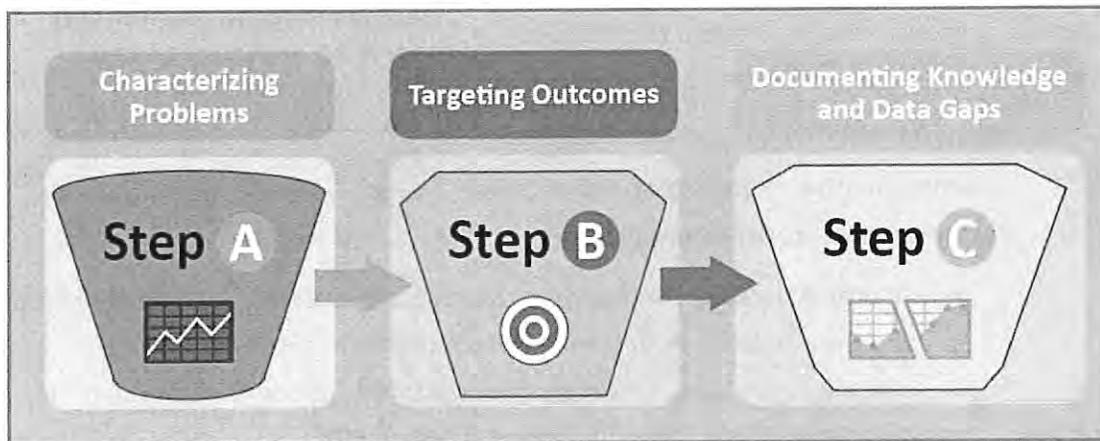


Figure ES.3: Core Strategic Planning Steps (applies to Outcome Levels 2 through 6)

Executive Summary



Step A

Characterizing Problems

During characterization, managers explore what is known about existing conditions at all Outcome Levels, determine which of them constitute problems, and develop priorities for the changes to be sought through program implementation. This work is divided into three tasks as shown and described below.

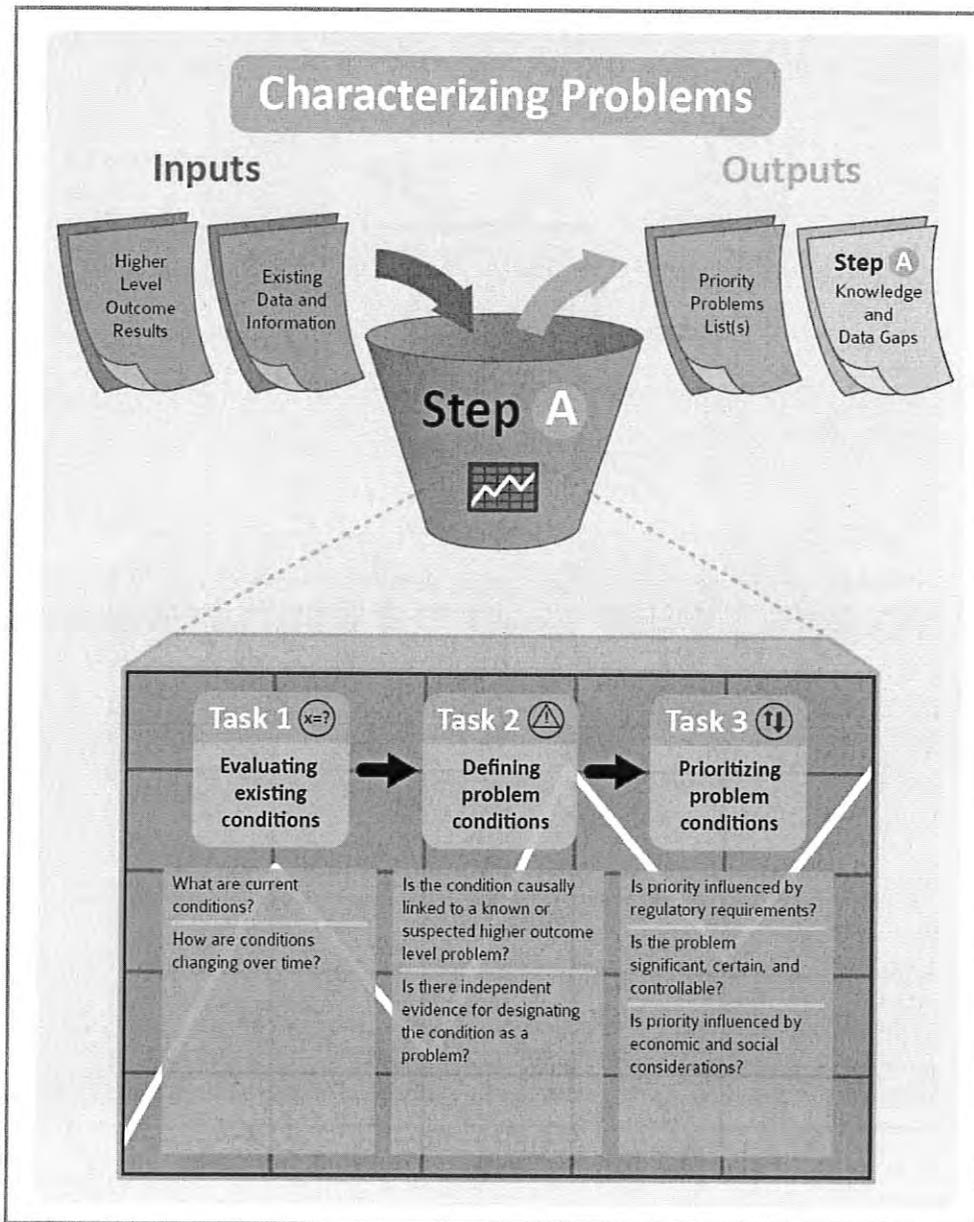


Figure ES.4: General Process for Characterizing Problems

Executive Summary

Step B Targeting Outcomes

Targeted outcomes will define what a control strategy is designed to achieve, and in turn how specific actions can be directed to facilitate these changes.

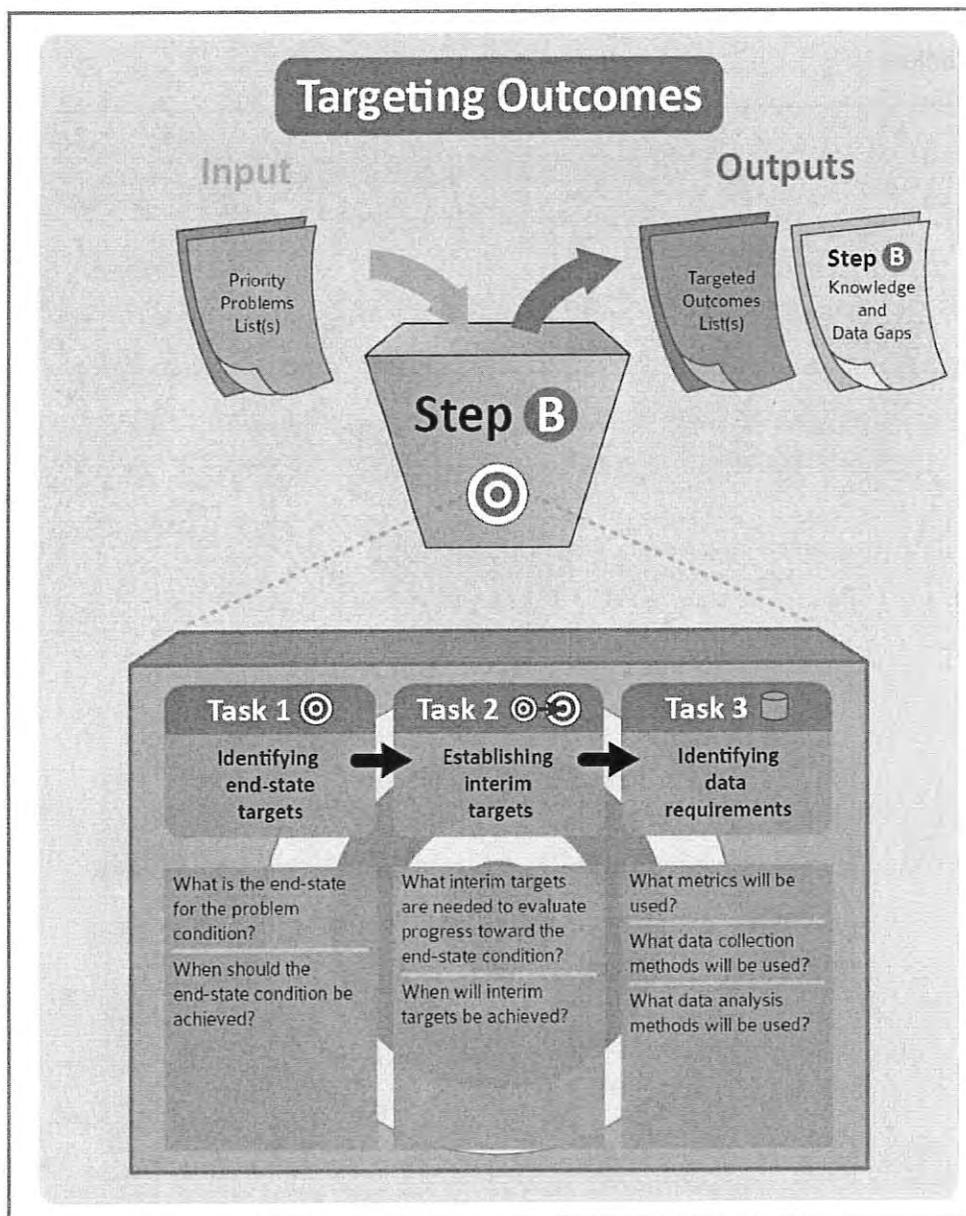


Figure ES.5: General Process for Targeting Outcomes

Executive Summary

Step C Documenting Knowledge and Data Gaps

Knowledge and data gaps should be documented throughout the planning process, and strategies developed for addressing critical gaps through targeted data gathering initiatives.

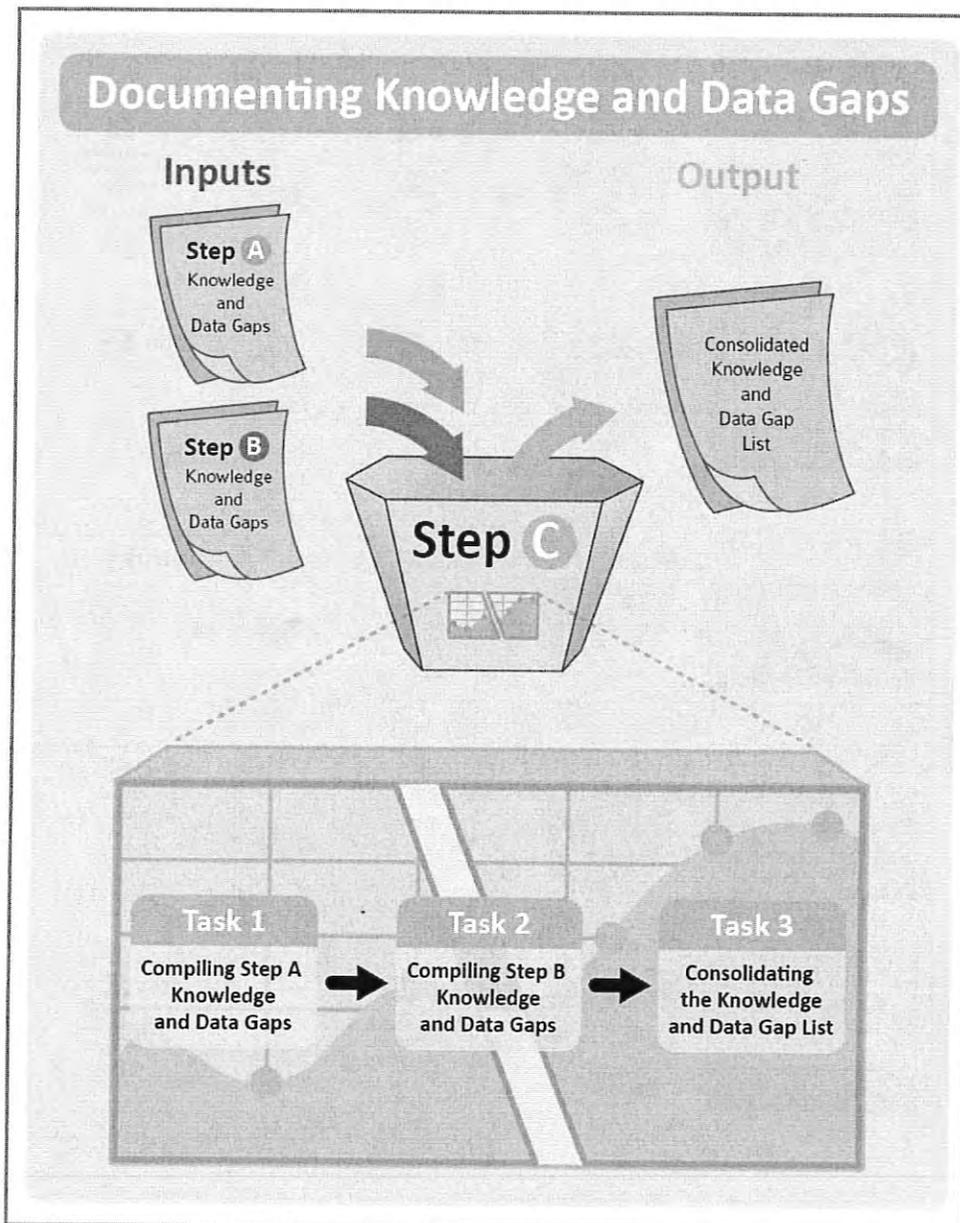


Figure ES.6: General Process for Consolidating Knowledge and Data Gaps (Step C)

Executive Summary

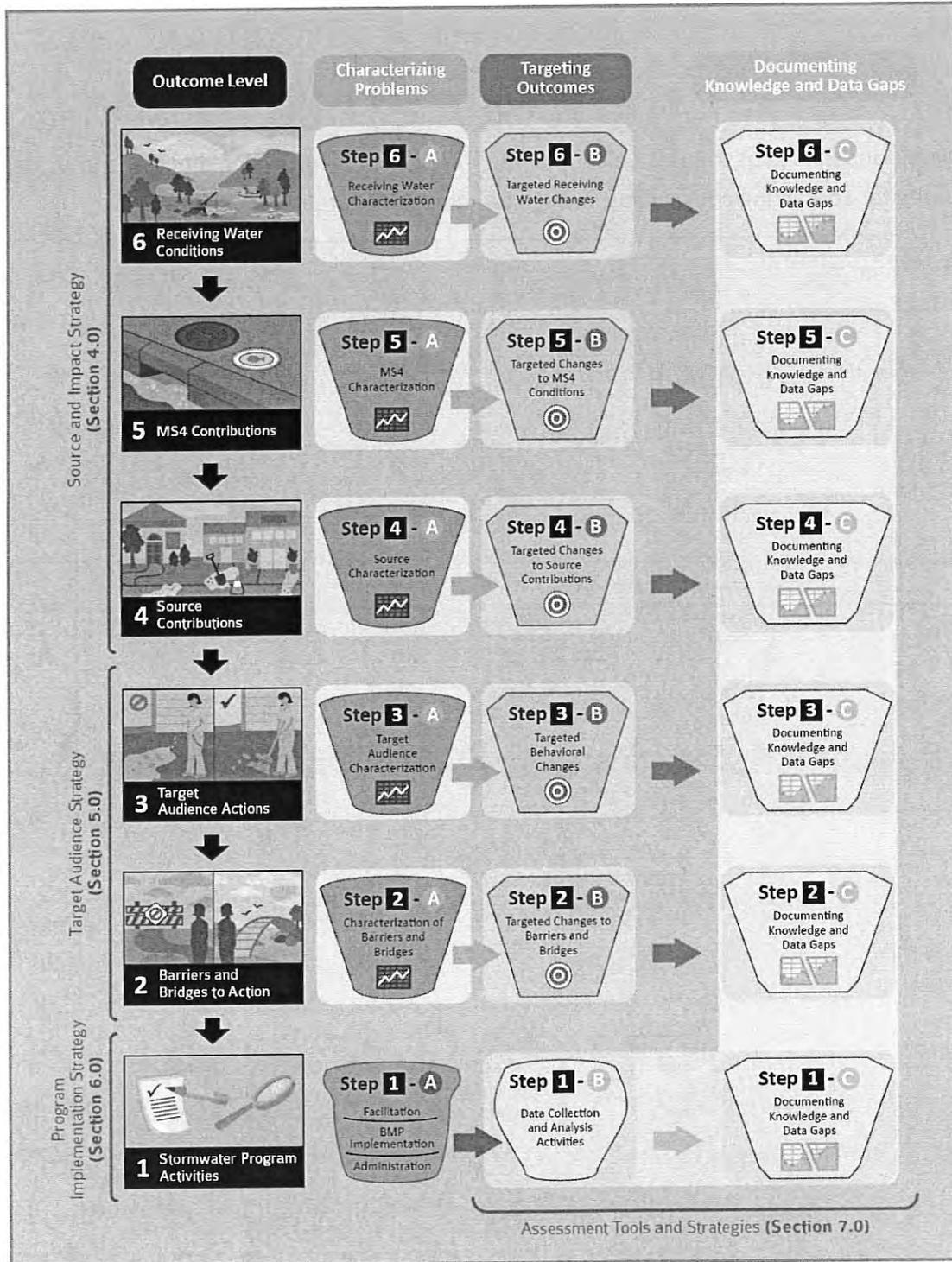
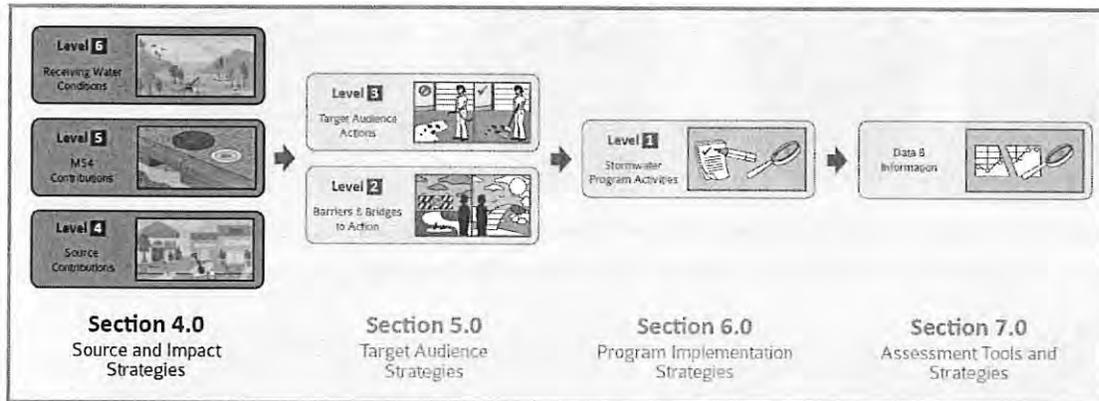


Figure ES.7: Strategic Planning Process Overview

Executive Summary

ES.4. Source and Impact Strategies (Section 4.0)

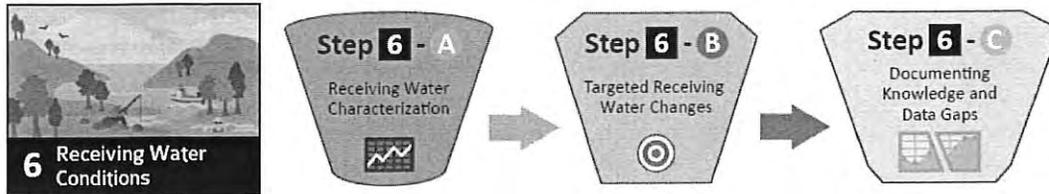


This section describes the development of **Source and Impact Strategies**. This section utilizes the strategic planning process presented in Section 3.0 to identify and prioritize sources of pollutants and flows to receiving waters. It begins with the evaluation of receiving water problems, and then “works back” toward potential contributing sources via MS4s and associated drainage areas. Following this approach, source priorities can be identified in response to demonstrated priority water quality impacts. However, since receiving water and MS4 impacts are often not well-documented, “preventive” approaches that focus primarily on the potential of sources to generate flows or pollutants must also be considered.

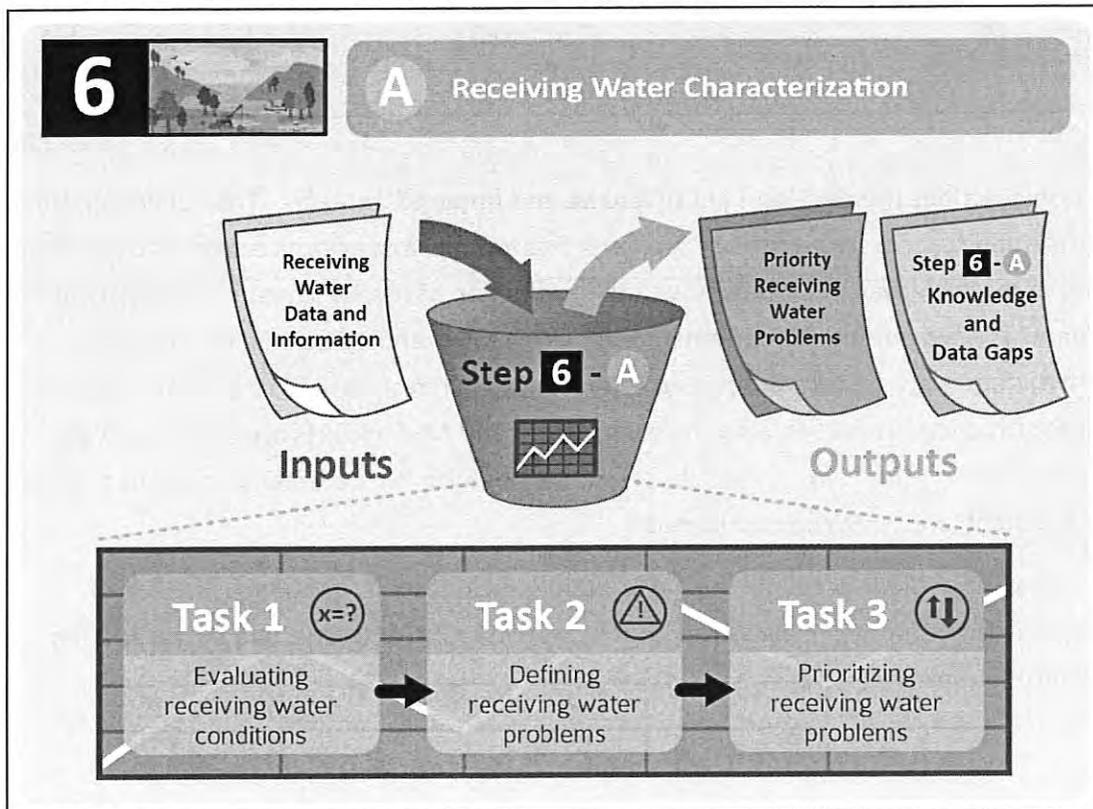
The development of the Source and Impact Strategies includes the following approach to evaluating outcomes for Receiving Water Conditions, MS4 Contributions, and Drainage Area and Source Contributions.

Executive Summary

Outcome Level 6: Receiving Water Conditions

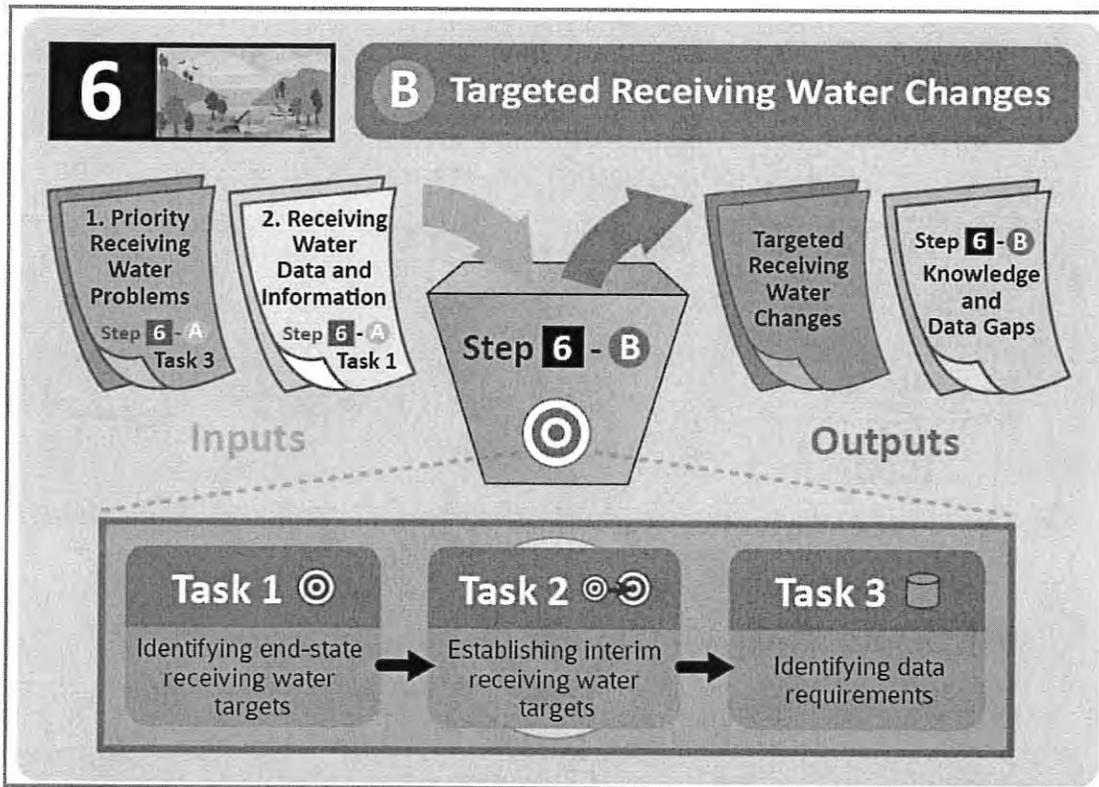


- In **Step 6-A**, managers review existing data and information to evaluate conditions in receiving waters. Initial results are then narrowed to focus on priority problem conditions.



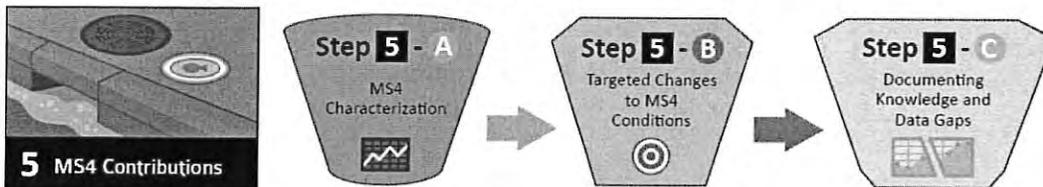
- **Step 6-B** focuses on defining the changes that will be sought in these conditions over time.

Executive Summary



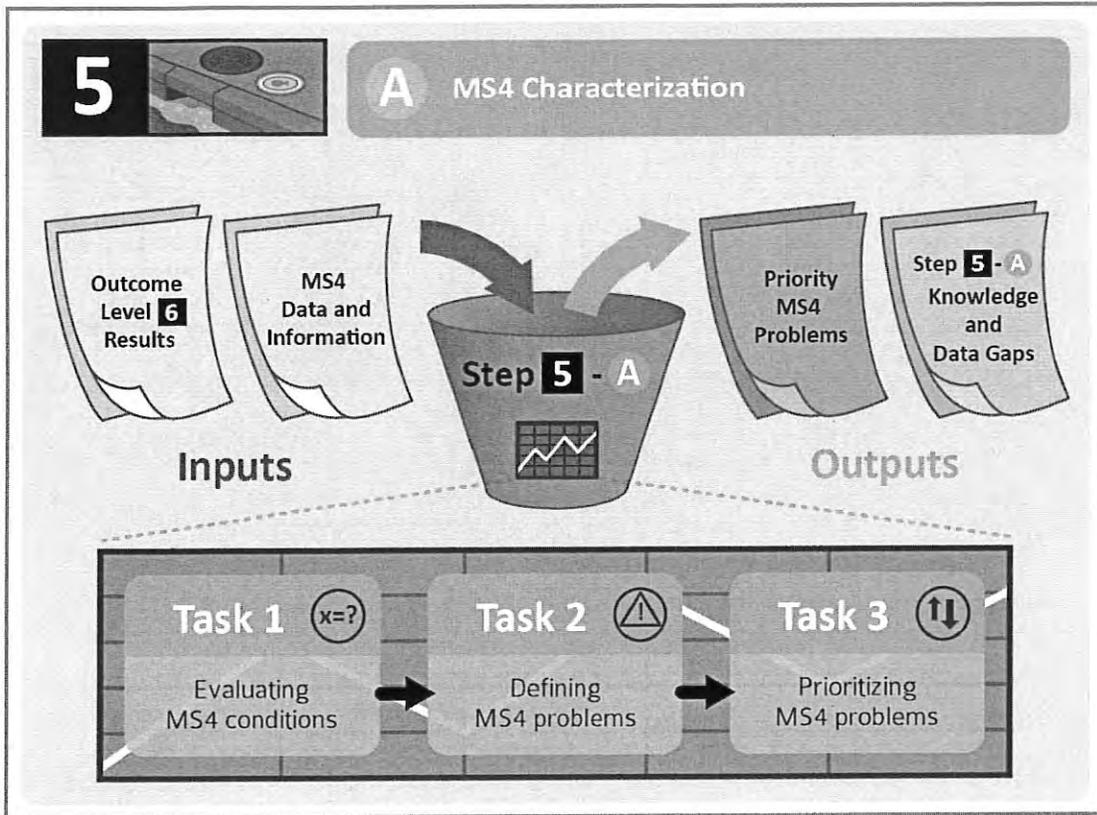
- Finally, **Step 6-C** identifies the knowledge and data gaps discovered along the way, so that future data collection initiatives can be directed toward resolving them.

Outcome Level 5: MS4 Contributions

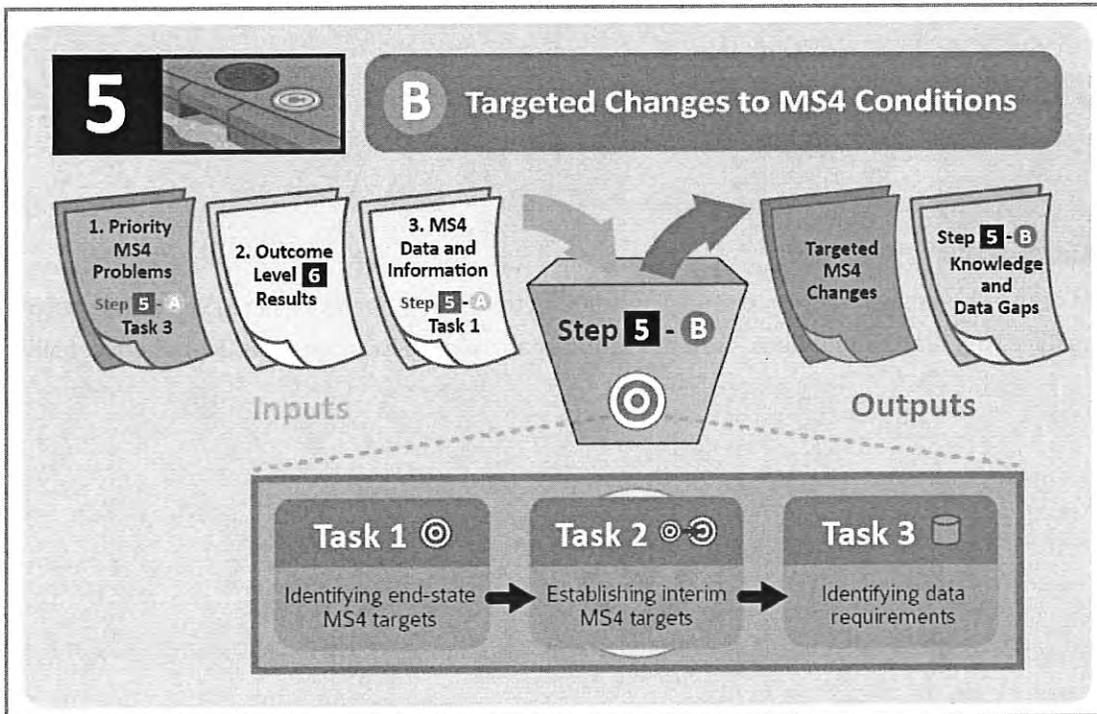


- In **Step 5-A**, managers review existing information to evaluate conditions in MS4s and contributions to Receiving Water Conditions. Results are then narrowed to focus on priority problem conditions.

Executive Summary



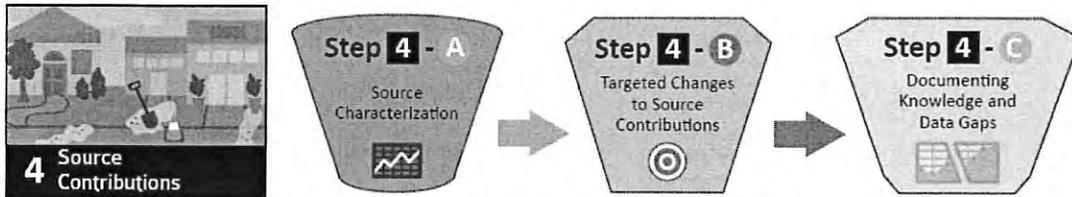
- Step 5-B focuses on defining the changes that will be sought in these conditions over time.



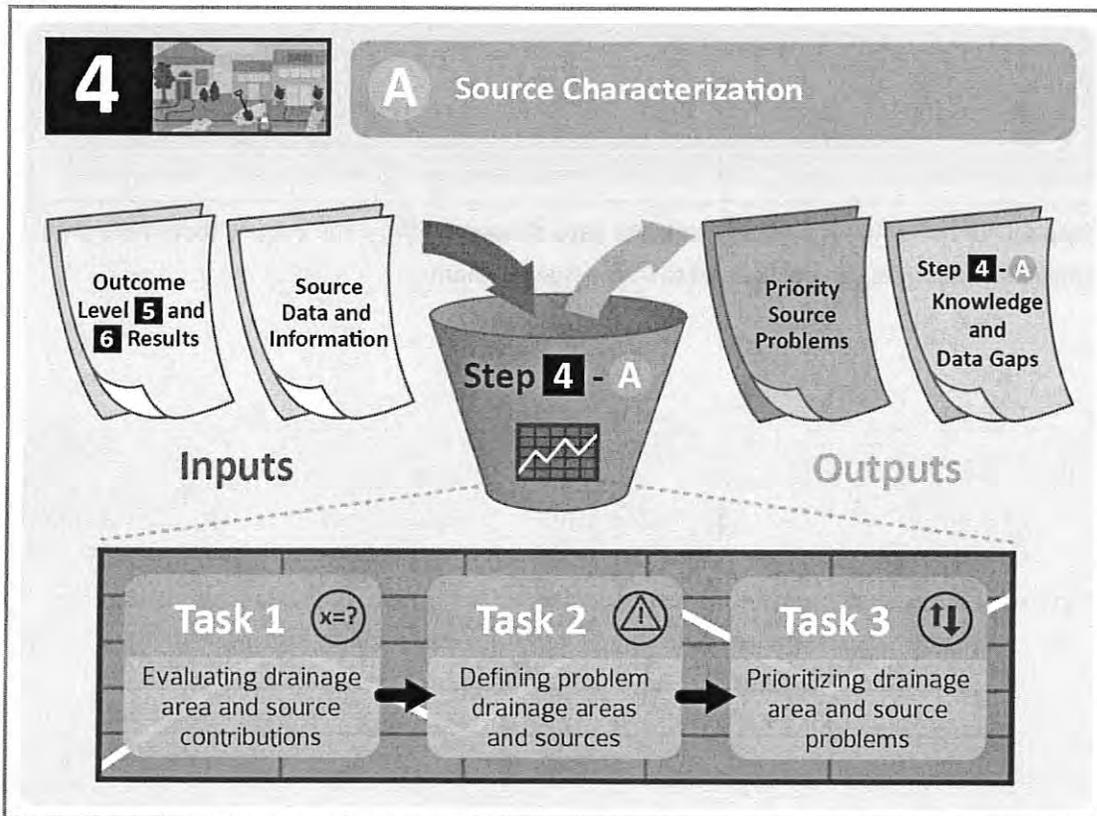
Executive Summary

- **Step 5-C** identifies the knowledge and data gaps discovered along the way, so that future data collection initiatives can be directed toward resolving them.

Outcome Level 4: Source Contributions

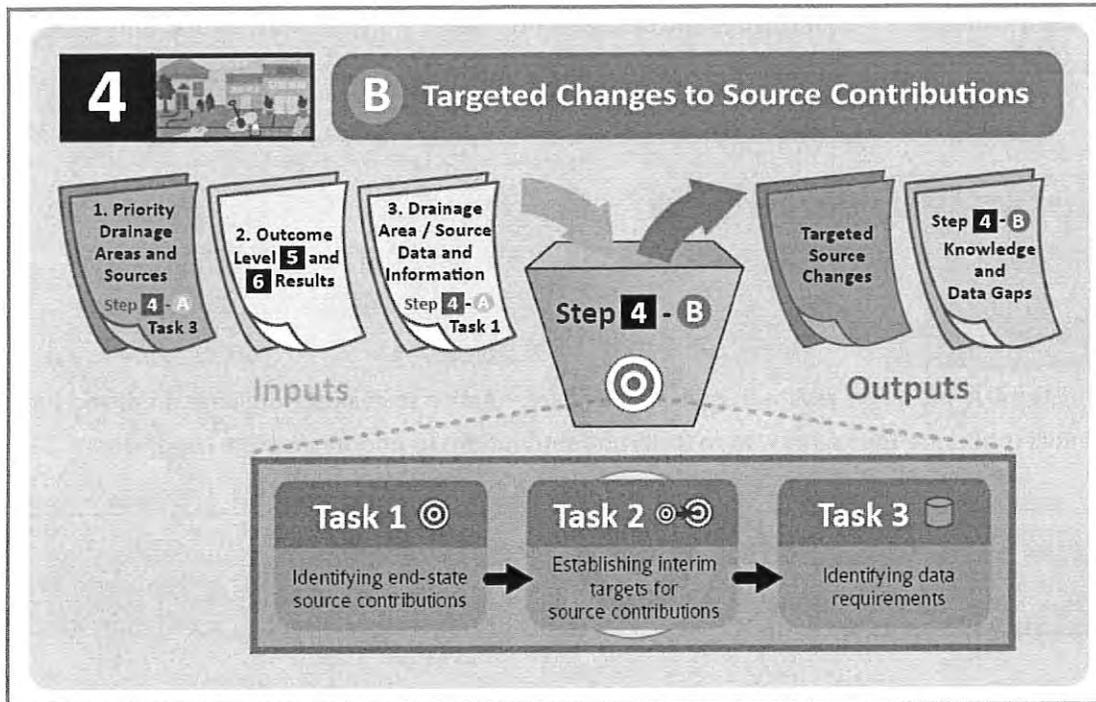


- In **Step 4-A**, managers review existing data and information to evaluate drainage areas and sources. Initial results are then narrowed to focus on contributions to priority problem conditions.



- **Step 4-B** focuses on defining the changes that will be sought in these conditions over time.

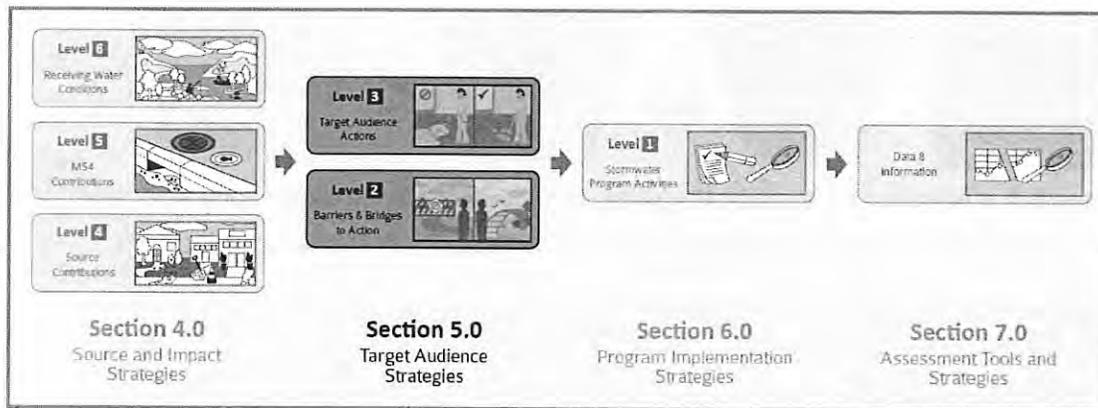
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- **Step 4-C** identifies the knowledge and data gaps discovered along the way, so that future data collection initiatives can be directed toward resolving them.

Executive Summary

ES.5. Target Audience Strategies (Section 5.0)

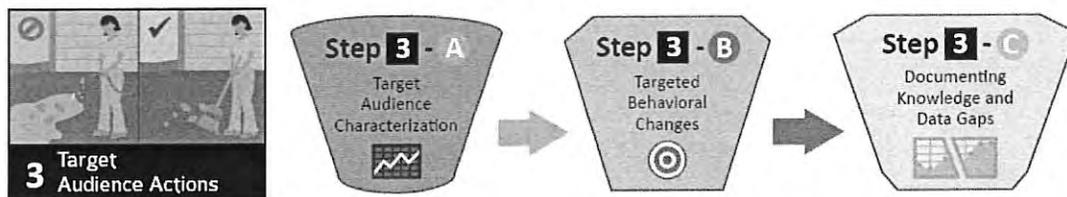


This section describes the development of **Target Audience Strategies**. Following the identification and prioritization of source contributions, as described in Section 4.0, target audience planning addresses Outcome Levels 3 and 2. Managers will focus on identifying the people that are responsible for these contributions, and then on characterizing the specific behaviors attributable to them. Ultimately, they will need to know how people should be acting differently and develop a clear understanding of the factors that may be standing in the way of desired changes.

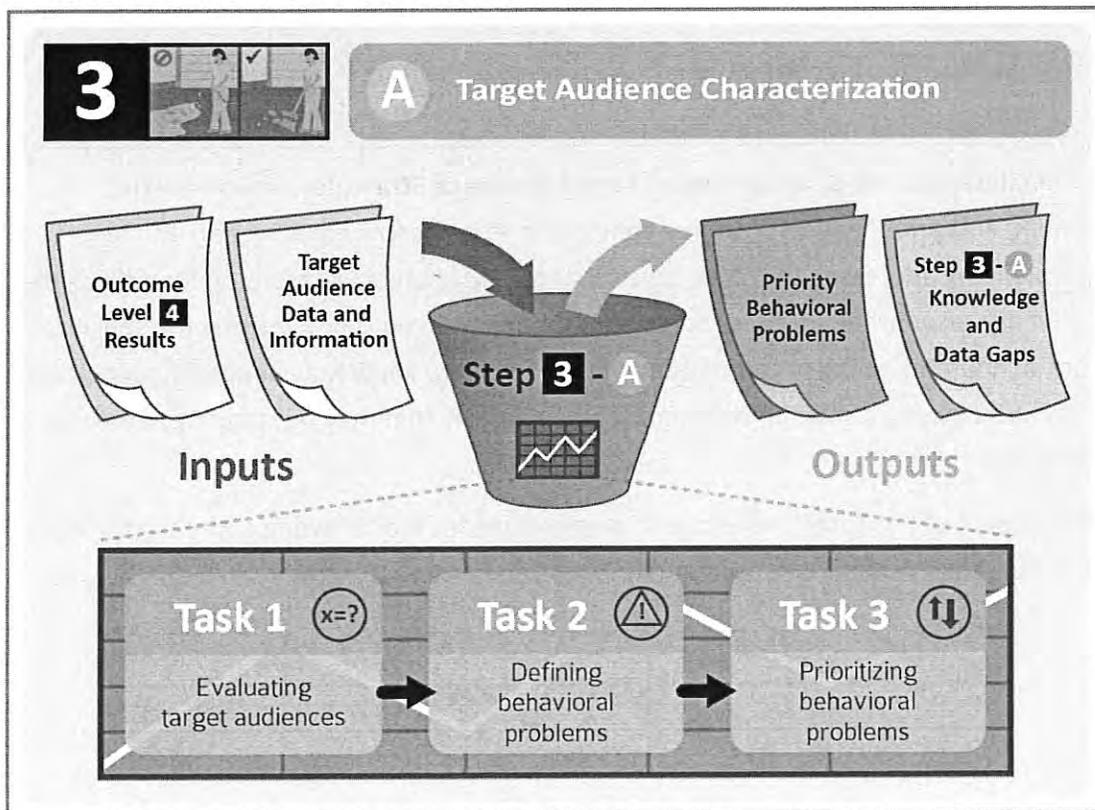
The development of the Target Audience Strategies includes the following approach for evaluating outcomes for Target Audience Actions and Bridges and Barriers to Action.

Executive Summary

Outcome Level 3: Target Audience Actions

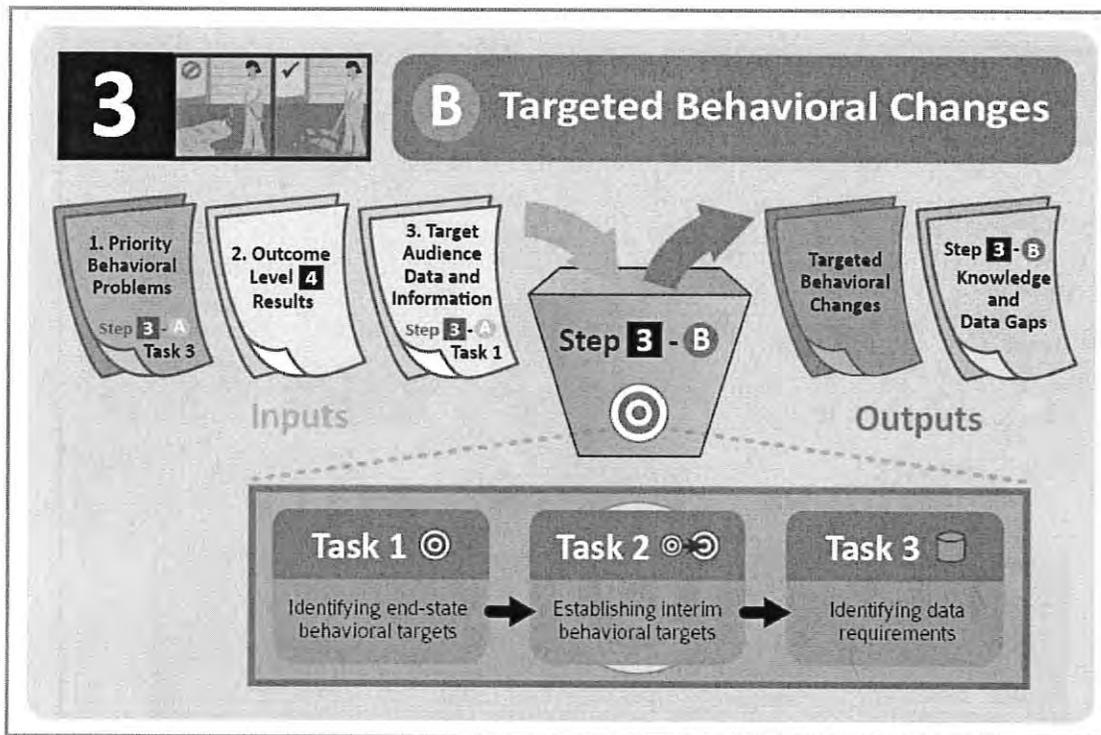


- In **Step 3-A** managers will identify, prioritize, and learn about the target audiences and their actions that may be responsible for the identified priority source contributions.



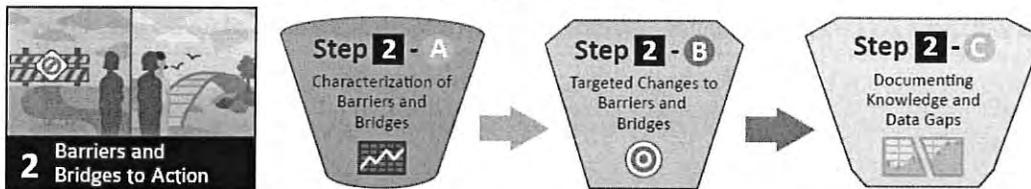
- Once priority target audiences and behaviors are identified, specific changes in them will be targeted in **Step 3-B**.

Executive Summary



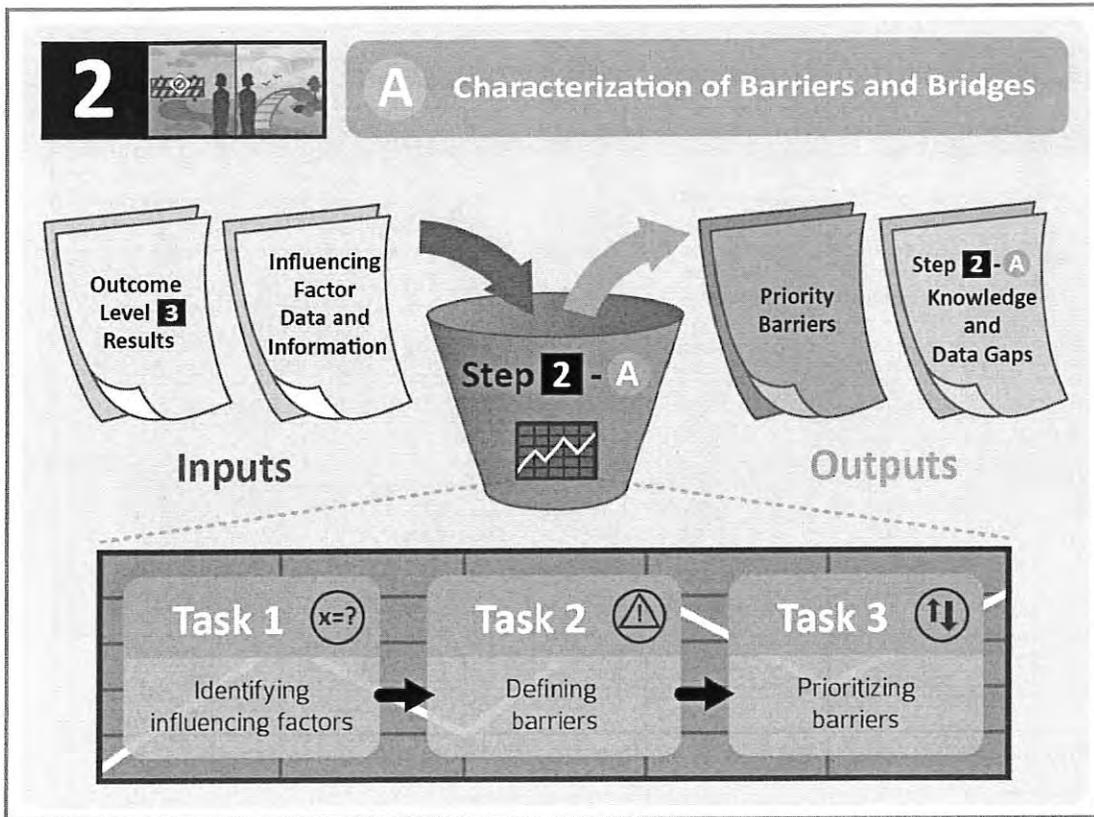
- Knowledge and data gaps will be summarized and documented in **Step 3-C**.

Outcome Level 2: Barriers and Bridges to Action

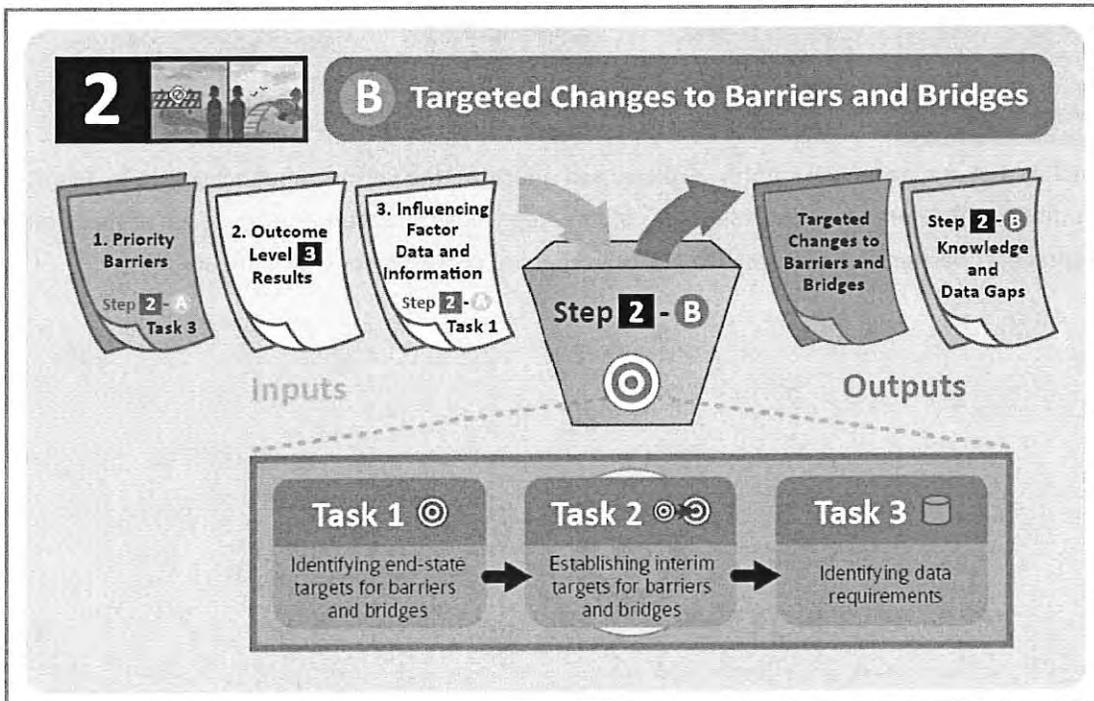


- In **Step 2-A** managers will identify, explore, and prioritize, the factors influencing priority target audience behaviors. An important focus of this step will be to determine how each of these might represent “**barriers**” or “**bridges**” to practices that are protective of water quality.

Executive Summary



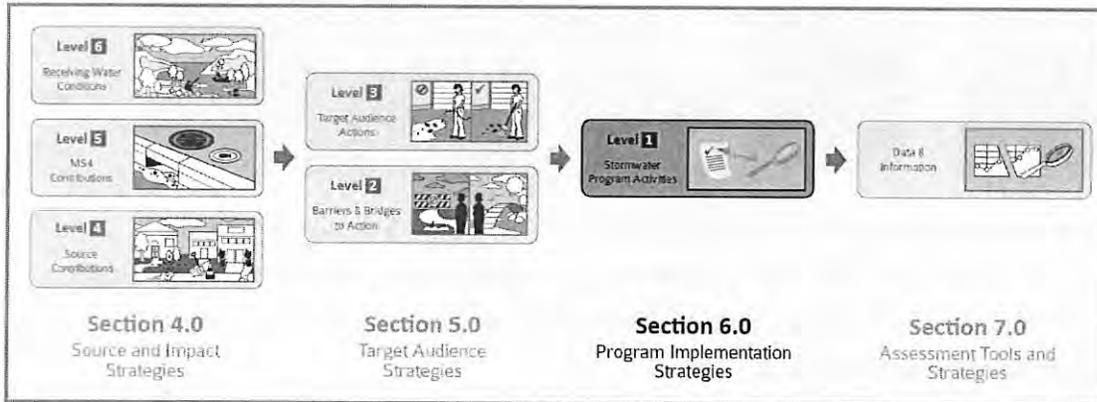
- Step 2-B will focus on targeting changes in factors that favor implementation of BMPs over PGAs.



- Finally, Step 3-C will look at the knowledge and data gaps discovered along the way.

Executive Summary

ES.6. Program Implementation Strategies (Section 6.0)

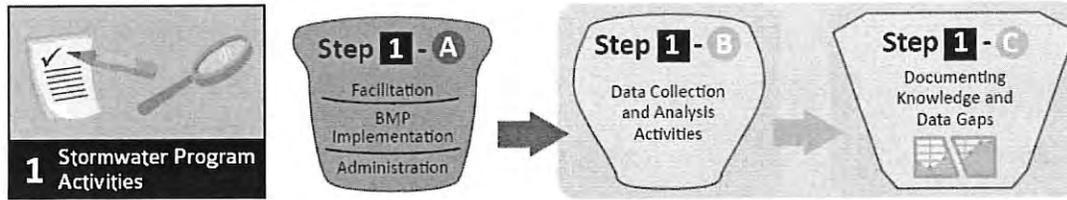


This section describes the development of **Program Implementation Strategies**. Following the completion of Target Audience Strategies, as described in Section 5.0, program implementation planning addresses Outcome Level 1. Managers will consider the target audiences, critical behaviors, and barriers and bridges already identified to develop stormwater program implementation strategies for bringing about targeted changes. Other activities needed to support general program operation and to obtain feedback for evaluating success are also considered.

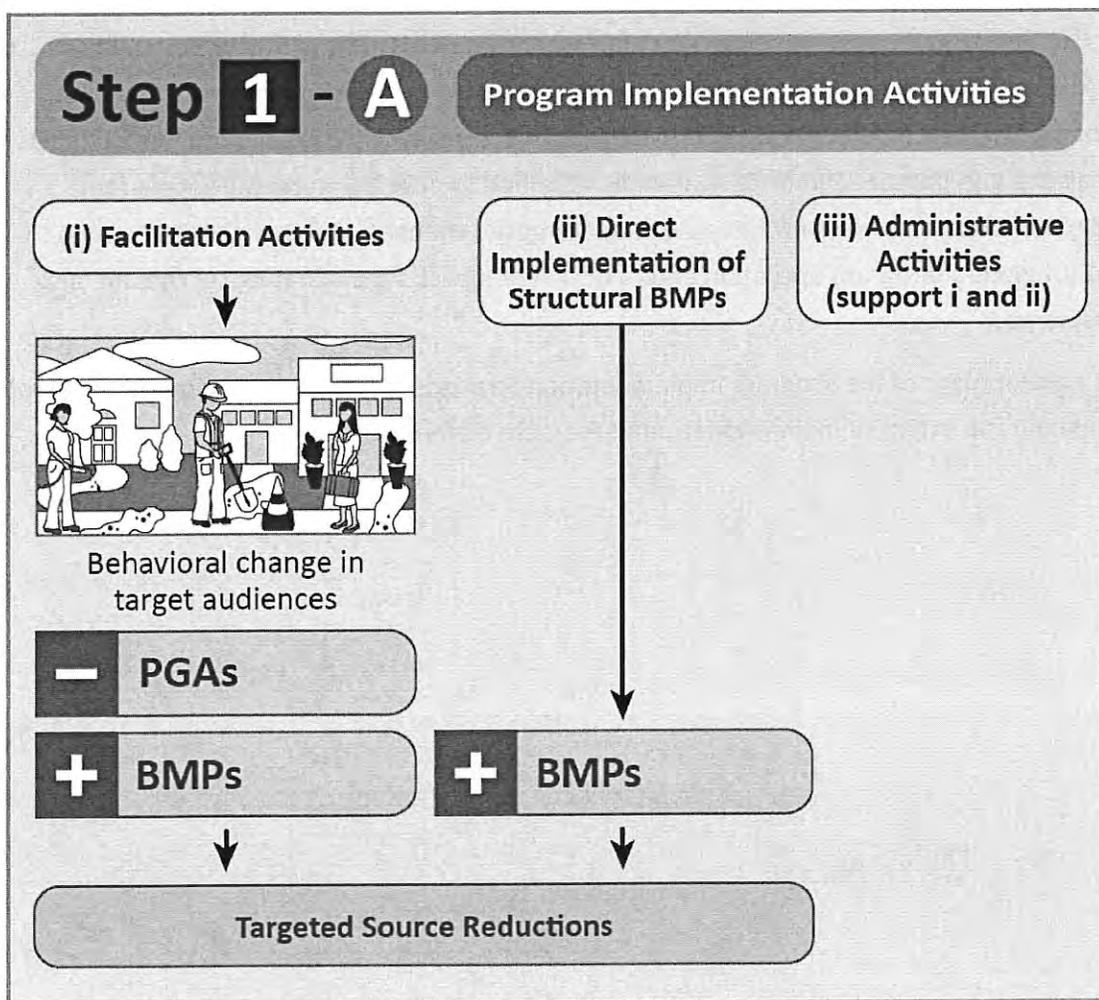
The development of the Program Implementation Strategies includes the following steps for evaluating the extent of implementation of Program elements.

Executive Summary

Outcome Level 1: Stormwater Program Activities

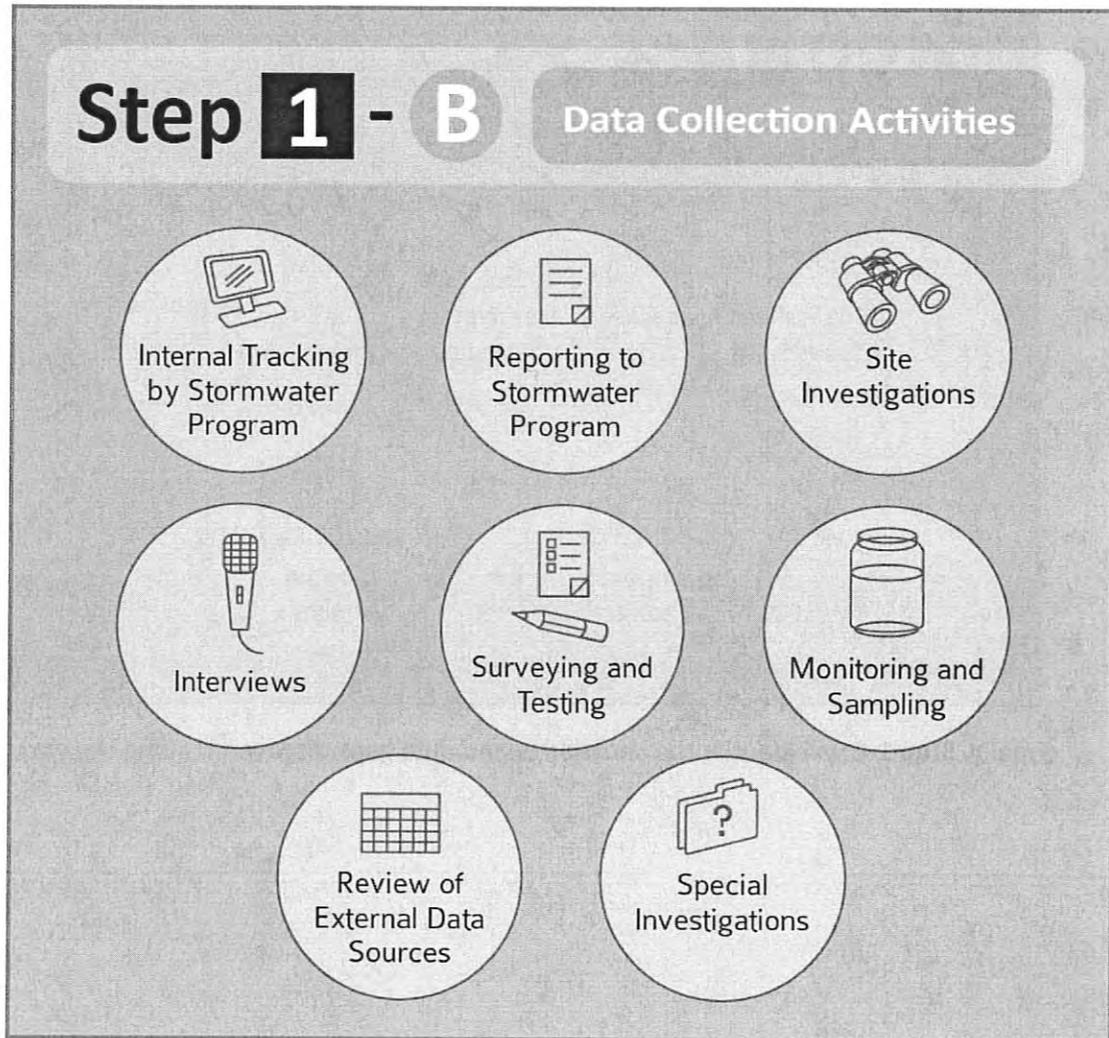


- In **Step 1-A** managers will identify the activities to be targeted during program implementation. This will initially entail the development of strategies to modify target audience behaviors, but BMPs that can be implemented directly by the stormwater program will also be identified.

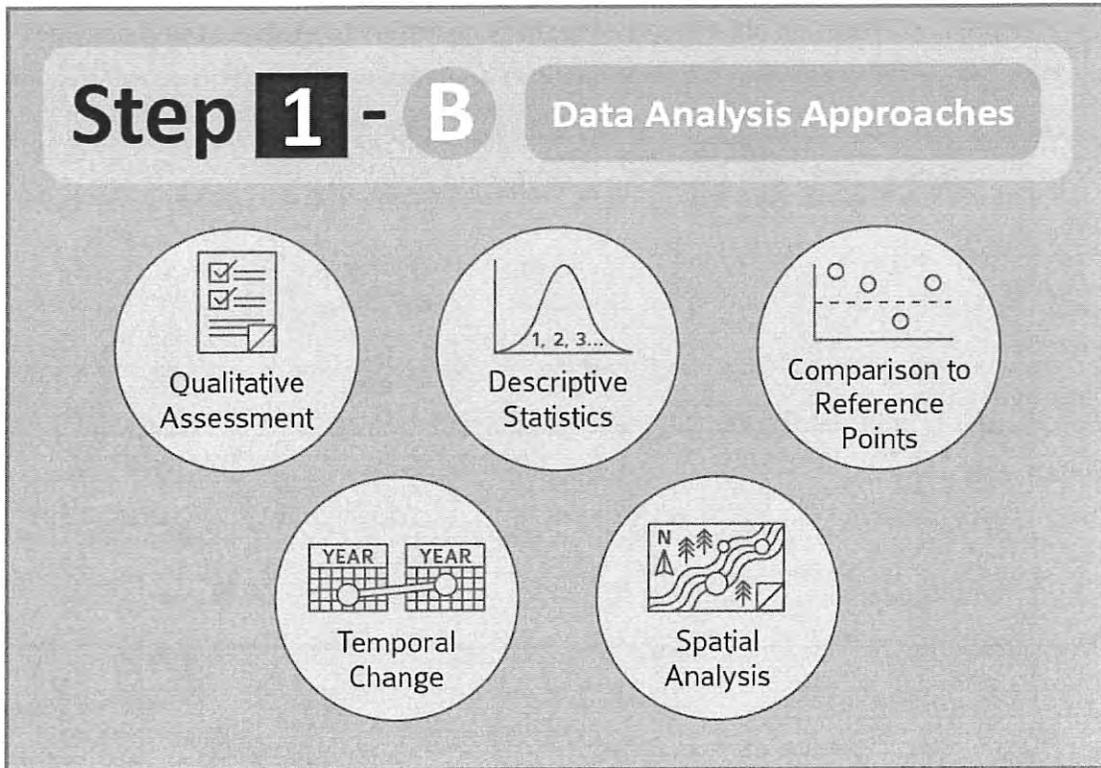


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- Step 1-B will focus on obtaining the feedback necessary to evaluate these activities.



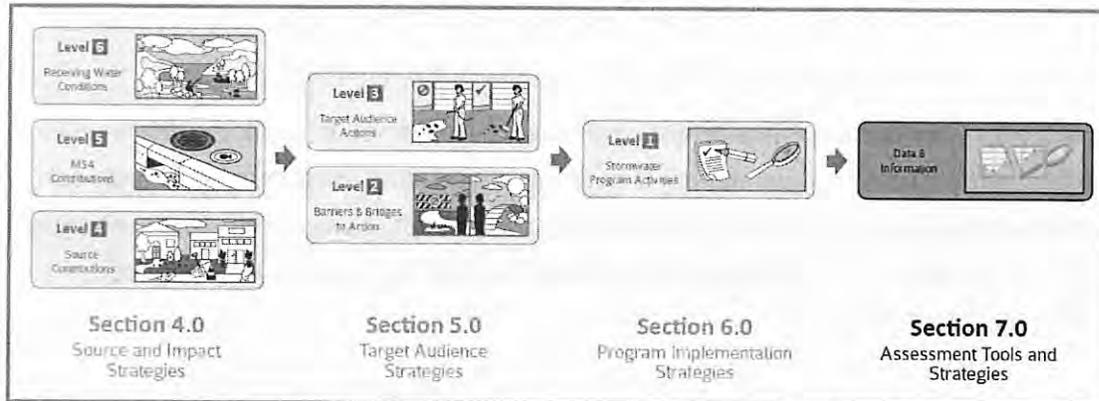
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- Finally, **Step 1-C** will identify the knowledge and data gaps discovered along the way.

Executive Summary

ES.7. Assessment Tools and Strategies (Section 7.0)



This section describes the development of **Assessment Tools and Strategies**. Up to this point, managers will have focused on a comprehensive planning process aimed at identifying a variety of specific measurable outcomes that will define success, guide the implementation of programs, and provide the structure and measurability needed to support a meaningful adaptive management approach.

This section builds on the targeted outcomes identified in Sections 4.0 through 6.0 to provide:

- **Data Collection and Assessment Design and Implementation:** includes monitoring and study design frameworks and approaches to data collection and analysis for each of the Outcome Levels.
- **Application of Data Collection and Program Assessment Methods:** this section provides examples of how to apply these data collection and analysis and assessment methods and approaches to outcome types such as MS4 water quality, source contributions to pollutant loading, and behaviors changes for compliance at construction sites.
- **Adaptive Management:** the results from the Assessment Strategies will provide feedback to assess progress and original assumptions in order to adapt and modify the program to more effectively reach the interim and end-state goals.

Assessment Strategy is the approach that will be used to collect and analyze data to track and assess the interim targets for each of the outcome levels. This strategy is part of an adaptive management approach that provides feedback into the program to improve its' effectiveness.

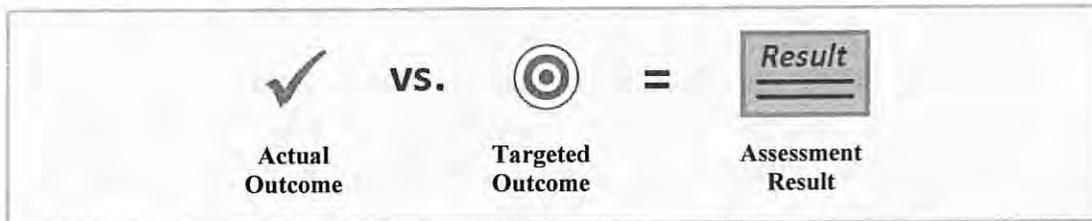
The Assessment Strategy will, based on the identified targeted outcomes, metrics and timelines from each Outcome Level, identify the methodology for data collection and analysis.

Executive Summary

ES.8. Interpretation and Use of Results (Section 8.0)

This section describes how analyses can be conducted, reported out on, and used to improve the stormwater program. Examples of effectiveness assessment are also provided.

Once the strategy for the program effectiveness assessment has been developed, the stormwater program manager should identify the data that is necessary to conduct the assessments and ensure that the approach and infrastructure for the data collection is in place. This step is critical in order to be able to conduct the desired analyses and report out on the goals and/or metrics identified within the PEA strategy.



The analyses can assist program managers in assessing progress in meeting intermediary goals, long-term goals, and identifying programmatic changes that may be necessary in order to obtain a stormwater program goal. In addition, the results may be presented to interested parties so that they may understand the benefits of the stormwater program.

Once an effectiveness assessment has been conducted, stormwater program activities should be modified, as needed, based on the results of the assessment. Modifications may include:

- Improving upon areas that did not accomplish goals;
- Expanding upon efforts that proved to be effective;
- Discontinuing efforts that may no longer be productive; or
- Shifting priorities to make more effective use of resources.

Since the development and implementation of a stormwater program is a phased effort and higher Outcome Levels often require relatively large amounts of data over a period of years, many programs will initially assess the effectiveness of the lower Outcome Levels. However, assessments should be conducted at the highest Outcome Level supported by the data, and program managers should strive to address the higher Outcome Levels as soon as possible.

The rest of the section includes examples of various effectiveness assessments that have been conducted by municipal stormwater programs throughout the state. These examples will assist other stormwater program managers in determining what metrics they may want to utilize for their program and/or how they may conduct their analyses and use the results.

ATTACHMENT 62

FRAMEWORK FOR DEVELOPING HYDROMODIFICATION MONITORING PROGRAMS



Technical Report 752
March 2013



Eric D. Stein
Brian P. Bledsoe

Southern California Coastal Water Research Project

FRAMEWORK FOR DEVELOPING HYDROMODIFICATION MONITORING PROGRAMS

Eric D. Stein and Brian P. Bledsoe

Technical Report 752

March 2013

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EXECUTIVE SUMMARY

In recognition of the pervasive effects of hydromodification (i.e. alteration of runoff patterns associated with change in land use that result in change in physical channel conditions) on southern California streams, many municipalities are now required to develop hydromodification management programs. Monitoring the effectiveness of these programs is critical because hydromodification management is in its infancy, and there is much to be learned from early efforts. This document is intended to provide a framework to assist state agencies, local jurisdictions, and municipal stormwater permittees in developing detailed hydromodification monitoring plans to address specific management and reporting needs.

Monitoring the effects of hydromodification is challenging. Physical changes associated with changes in runoff are difficult to assess because they can result from a combination of contemporary land-use changes, legacy land practices (e.g. grazing), and stochastic events (e.g. floods and fires). Furthermore, channel adjustments can occur dramatically and rapidly after extended periods of apparent stability and can vary over small distances. Separating out the effects of human activity from natural cycles of channel evolution further complicates hydromodification monitoring and requires much longer term monitoring than traditional water quality programs.

Given the need for long-term commitment and investment, we propose a tiered approach to hydromodification monitoring. This tiered approach can be implemented in phases with different elements being prioritized based on management information needs, condition of managed streams, and available resources. Monitoring for each element is based on one or more directed questions that guide specific monitoring designs:

Performance Assessment

- 1) How well do various BMPs, control strategies, and management measures perform relative to their design expectations and in light of how well they are maintained?
- 2) What factors influence the efficacy of hydromodification management strategies?

Effectiveness Assessment

- 3) How effective are specific management strategies at protecting the physical and biological integrity of streams from the effects of hydromodification (in the context of other watershed stressors)?
 - a) How do these effects compare to patterns at unimpacted “reference” sites?
 - b) Are the management strategies sufficiently protective of all stream types?
 - c) How does effectiveness vary by stream type (e.g. substrate, planform, slope)?

Spatial and Temporal Trends Assessment

- 4) What is the spatial footprint of response to hydromodification effects or management actions relative to discharge locations?
 - a) How far up or downstream do potential effects of hydromodification persist?

- 5) How do responses to hydromodification management vary over time?
 - a) What is the effect of natural rainfall and runoff patterns on stream response in the presence or absence of management measures?
 - b) How long do “restored” or “rehabilitated” stream reaches take to recover following remediation?
 - c) How do responses vary based on stream type (e.g. substrate, planform, slope) and environmental setting (e.g. watershed position relative to upstream land use, floodplain condition)?

Ambient (Characterization) Monitoring

- 6) What is the physical and biological condition of streams relative to established regulatory or management objectives?
 - a) How does condition vary by stream type (e.g. substrate, planform, slope) and environmental setting (e.g. watershed position relative to upstream land use, floodplain condition)?

In general, the first and second elements (performance and effectiveness monitoring) of hydromodification monitoring can be addressed by multi-year monitoring programs typically managed by municipalities and other local entities. In contrast, the third and fourth elements (trends and ambient condition) must be addressed over longer time scales (e.g., decadal) through cooperative regional monitoring that involves multiple entities including state, regional, local agencies and grant programs (Figure ES-1).

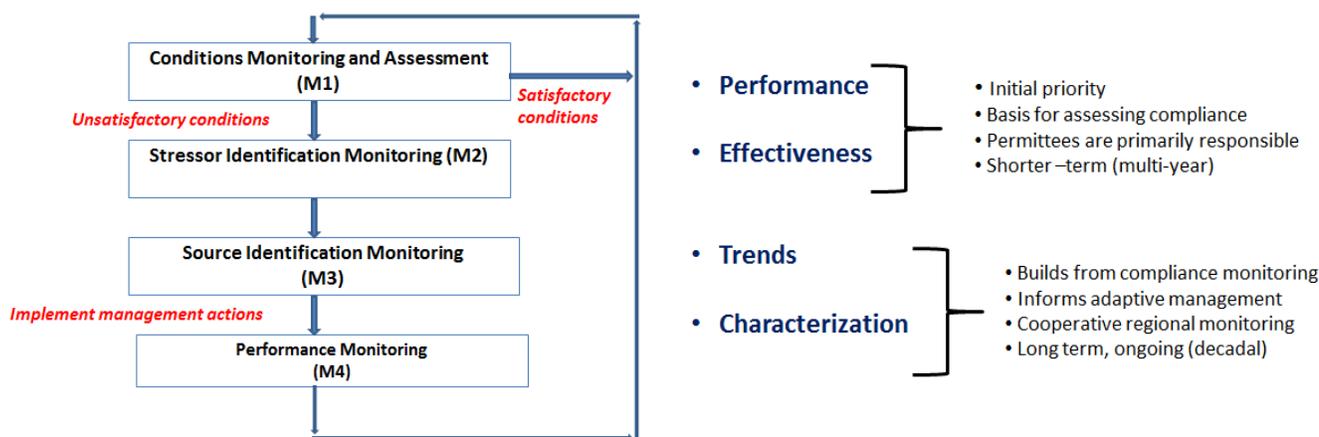


Figure ES-1. Major elements of hydromodification monitoring. General framework (left) and phasing (right)

Addressing all elements of the monitoring plan includes two basic designs: targeted and probabilistic sampling. Targeted sites include reference sites, sentinel sites, and sites downstream of specific BMPs or other management actions (e.g. restoration areas). A summary of the relationship between site types and monitoring questions is provided in Table ES-1.

Table ES-1. Relationship between type of monitoring site and management questions addressed.

Type of Site	Monitoring Questions
Reference sites	1. performance 3. effectiveness
Provide context	5. temporal trends 4. spatial extent of effects
Differentiate effects from natural variability	6. ambient condition
BMP monitoring sites	1. performance
Evaluate performance relative to goals	3. effectiveness (short term)
Evaluate compliance	
Targeted and sentinel sites	2. efficacy of management measures
Evaluate effectiveness of management actions	3. effectiveness 5. temporal trends
Evaluate spatial and temporal trends	4. spatial extent of effects 6. ambient condition
Probabilistic	3. effectiveness (short term)
Provide regional context	6. ambient condition
Interpret long-term trends	
Help understand natural variability	
GIS analysis	2. efficacy of management measures
Provide spatial context	
Provide insight into causal factors	

Three types of indicators are recommended for inclusion in hydromodification monitoring plans. Pressure indicators measure factors that can cause a response in the stream channel, such as flow. State indicators measure the physical condition of the stream and should include measures that can provide an early detection of potential channel response, such as shifts in the composition of the bed material or channel morphology. Response indicators measure the ecological endpoints of concern from a management perspective and should include long-term integrative measures of condition, such as benthic macroinvertebrates and algae. The pressure-state-response approach to monitoring includes measures of hydrology, geomorphology, and biology, as shown in Table ES-2.

Table ES-2. Summary of recommended field indicators along with their assessment endpoints and the monitoring questions that they support.

	Variable Type			Assessment Endpoint	Monitoring Questions
	P	S	R		
Hydrologic Indicators					
Stream flow	■	■		long term flow magnitude and duration	3, 4, 5
BMP inflow and outflow	■			discharge magnitude and duration	1, 5
Geomorphic Indicators					
Bed material composition		■		substrate size as d50	3, 4, 5, 6
Armoring potential		■		dominant substrate type and interstitial material	3, 4, 5, 6
Grade control		■		presences, spacing and condition of grade control	3, 4, 5, 6
Incision/downcutting risk		■		potential specific stream power relative to d50	3, 4, 5, 6
Probability of mass wasting		■		critical bank height and bank angle	3, 4, 5, 6
Evidence of fluvial erosion		■		evidence of erosion at the toe of slope	3, 4, 5, 6
Consolidation of bank material		■		field penetration tests of banks	3, 4, 5, 6
Channel width:valley width		■		active channel vs. floodplain	3, 4, 5, 6
Channel Evolution Model class		■		field observations of CEM class	3, 4, 5, 6
Channel geometry		■		channel cross-sections and longitudinal profile	1, 3, 4, 5
Physical Habitat Assessment (PHAB)	■	■		standard PHAB metrics	3, 4, 5, 6
Biologic Indicators					
Benthic macroinvertebrates			■	IBI, component metrics, functional groups	3, 4, 5, 6
Stream algae			■	IBI, component metrics, functional groups, biomass	3, 4, 5, 6
California Rapid Assessment Method	■	■	■	index score, attribute scores, metric scores	3, 4, 5, 6

Hydromodification monitoring should be a component of a larger integrated management program and should be prioritized in the context of other monitoring efforts (e.g. water quality, bio-objectives). Much of the baseline information necessary for the design of effective monitoring programs can be obtained by up-front watershed analysis. Watershed assessment also provides insight into the historic and contemporary causes of hydromodification, which can inform development of monitoring programs. The results of monitoring should be used to refine and adapt management programs over time.

Full benefits of monitoring accrue based on a commitment to long-term (multi-decadal) implementation, which requires infrastructure to support the monitoring program. We estimate the up-front per site cost to be \$5,250 and annual recurring per site cost to be \$11,500. If all monitoring elements were implemented, the annual cost would range from \$456,000 - \$569,500 per watershed management area, depending on the number of sites sampled each year. However, \$195,000 of that cost would be for ambient condition assessment at probabilistic sites. Monitoring elements can be phased and implemented by different entities in order to defray costs. Furthermore different elements of the monitoring plan can be prioritized based on condition of stream resources being protected and management priorities. The resources necessary to support long-term ongoing monitoring will be beyond the means of individual municipalities or permittees. Long-term implementation needs may be

most effectively met through coordination with existing monitoring programs and by sharing existing monitoring infrastructure. Over time, shared data can support causal assessment and provide information to improve hydromodification management.

This document can serve as a foundation to assist state agencies, local jurisdictions, and municipal stormwater permittees in developing detailed hydromodification monitoring plans to address their specific management and reporting needs. This document is intended to provide a set of monitoring elements that can be prioritized for implementation based on local needs; it is not intended to serve as prescriptive plan that should be universally implemented in all instances.

1.0 INTRODUCTION

Ongoing and well-structured monitoring is a critical component of watershed and water-quality management. Monitoring and management programs should be integrated such that practices intended to prevent or mitigate effects of land use on instream conditions should be refined and improved based on monitoring results. Monitoring is also important for assessing compliance with regulatory requirements and for evaluating program effectiveness. However, monitoring is only recently being applied to hydromodification management and with the exception of testing the efficacy of onsite BMP practices, standard approaches have not yet been developed.

Monitoring of hydromodification (i.e. alteration of runoff patterns associated with change in land use that result in change in physical channel conditions) management is particularly critical given the complexity and uncertainty associated with managing effects of hydrologic change on channel structure. Physical changes associated with changes in runoff are difficult to assess because they can result from a combination of contemporary land-use changes, legacy land practices (e.g. grazing), and stochastic events (e.g. floods and fires). Furthermore, channel adjustments can occur dramatically and rapidly after extended periods of apparent stability and can vary over small distances. Separating out the effects of human activity from natural cycles of channel evolution further complicates hydromodification monitoring and requires much longer term monitoring than traditional water quality programs. Due to the relative immaturity of hydromodification management practices as compared to traditional water-quality management, their effectiveness is also less certain. Thus, hydromodification monitoring is essential to allow adaptation and adjustment of early-generation practices to improve their performance over time.

Many stormwater permits require municipalities to develop “hydromodification monitoring plans” as part of their overall management programs. However, little guidance has been provided on the structure and content for these plans. As a result, monitoring plans vary in their approach and intensity. This inconsistency is inefficient, makes inter-jurisdictional comparisons and information sharing difficult, and precludes regional syntheses.

To begin addressing this issue, a statewide technical workgroup commissioned by the State Water Resources Board produced a broad set of recommendations for hydromodification monitoring as part of their report *Hydromodification Assessment and Management in California* (Stein et al. 2012). The proposed monitoring framework presented here is a tiered approach, designed to be executed at different spatial and temporal scales, to inform and help guide management actions.

In the context of hydromodification assessment and management, there are three interrelated purposes for monitoring which will guide the recommendations in this framework:

- Characterizing the conditions of receiving waters downstream of urban development (including any trends in those conditions over time).

- Evaluating the effectiveness of hydromodification controls at protecting or improving the conditions of downstream receiving waters *(and modify them, as needed).
- Setting priorities on the wide variety of hydromodification control practices.

These needs give rise to several interrelated types of monitoring, or elements, all common to many watershed and stormwater monitoring programs. They are typically executed at different spatial and temporal scales, and if well-designed and executed they can collectively help guide management actions. The four elements of the proposed monitoring framework include: 1) **performance monitoring** to evaluate whether a facility or practice meets its design objectives, 2) **effectiveness monitoring** to evaluate how well management actions or suites of actions reduce or eliminate the direct hydromodification impacts on receiving waters, 3) **trends monitoring** to provide an integrative assessment of whether our “endpoint” indicators (physical, chemical, or biological) are showing any consistent and statistically significant change over space and time, and 4) **ambient condition (characterization) monitoring** to provide context of the overall regional or watershed condition of receiving waters. In general, the first and second elements (performance and effectiveness monitoring) can be addressed by multi-year monitoring programs typically managed by municipalities and other local entities. In contrast, the third and fourth elements (trends and ambient condition) must be addressed over longer-time scales (e.g. decadal) through cooperative regional monitoring that must involve multiple entities include state, regional, and local agencies and programs (Figure 1). In practice, not all these elements need to be implemented at the same time or in the same locations. Implementation can be phased or tiered based on specific needs and resource constraints. Furthermore, different entities may be primarily responsible for different elements of the monitoring program (Table 1). In all cases, efforts should be coordinated between programs and entities to maximize the efficiency of implementation and opportunities for information sharing.



Figure 1. Major elements of hydromodification monitoring. General framework (left) and phasing (right)

Table 1. Phasing and different responsibilities for elements of hydromodification monitoring.

Timeframe	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	<ul style="list-style-type: none"> Define the watershed context for local monitoring (at coarse scale) Evaluate whether permit requirements are making positive improvements 	<ul style="list-style-type: none"> Evaluate whether specific projects/regulations are meeting objectives Identify the highest priority action(s) to take
Long-term (1+ decades)	<ul style="list-style-type: none"> Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) Demonstrate how permit requirements can improve receiving-water “health,” state-wide (and change those requirements, as needed) 	<ul style="list-style-type: none"> Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions Assess program cost-effectiveness Identify any critical areas for resource protection

The goal of this document is to build on the general recommendations provided by Stein et al. (2012) by providing more specific recommendations for hydromodification monitoring plans that address a set of common management questions in a consistent manner. This document can serve as a foundation to assist state agencies, local jurisdictions and municipal stormwater permittees in developing detailed hydromodification monitoring plans to address their specific management and reporting needs. This document is intended to provide set of monitoring elements that can be prioritized for implementation based on local needs; it is not intended to serve as prescriptive plan that should be universally implemented in all instances.

1.1 Hydromodification Monitoring in Context of Larger Management Programs

Hydromodification monitoring should be a component of a larger integrated management program (Figure 2). Watershed assessments conducted during development of integrated management programs provide much of the baseline information necessary for the design of effective monitoring programs. The location and intensity of monitoring (i.e. what gets monitoring at various locations) will depend on the stream types, opportunities and constraints identified during initial assessments. Similarly, the choice and location of management actions informs where monitoring should occur and what indicators are measured. Watershed assessment also provides insight into the historic and contemporary causes of hydromodification, which can inform development of monitoring programs. Therefore, monitoring programs should be developed using information compiled during these earlier efforts. The results of monitoring should be used to refine and adapt management programs over time.

It is also important to recognize that streams will respond to a variety of natural and anthropogenic stressors over varying time scales. Consequently, changes in condition detected as a result of a hydromodification monitoring program will need to be placed in the context of other stressors in the contributing drainage area (and their proximity to the stream reach being evaluated), climatic cycles, and recent disturbances (e.g. floods or fires). Management responses derived from hydromodification monitoring results should account for these factors and utilize other stream management programs as appropriate. Similarly, monitoring priorities should be established based on a consideration of the most important stressors acting on an individual watershed.

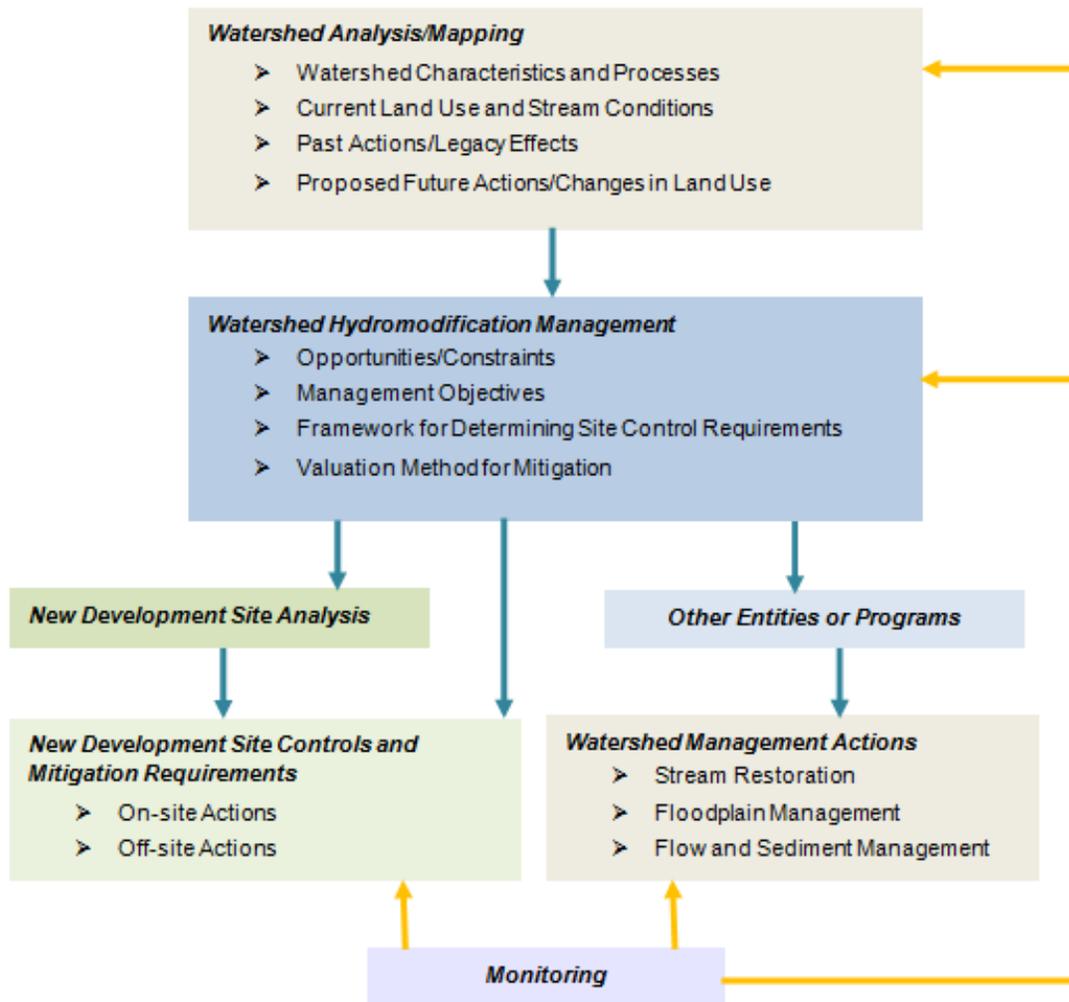


Figure 2. Framework for integrated hydromodification management.

1.2 Key Components of a Hydromodification Monitoring Plan

A successful monitoring plan will be flexible and adaptable, and will have a direct connection to management decisions. There are generally two priority management areas that drive the design of monitoring programs. The first is an evaluation of overall watershed and stream conditions, including stream health and beneficial uses. In its broadest sense, “health” encompasses chemical, physical, and biological integrity and should be evaluated using multiple indicators at multiple spatial scales (i.e., ranging from the entire landscape to site-specific). Hydromodification management is one of many important factors affecting watershed and stream health; therefore, hydromodification monitoring should be well integrated with regional programs that assess overall watershed and stream health. Causal assessment or stressor identification that may be conducted when conditions do not meet

agreed-upon goals and targets may identify hydromodification control as a priority action, increasing the importance of integrating hydromodification monitoring data into larger overall regional programs. The first priority management area should be addressed at a cooperative programmatic scale, involving multiple entities at state, regional, and local agencies and programs.

The second priority area is an assessment of compliance with regulatory requirements. This may include monitoring performance of specific BMPs or management measures and evaluation of whether targets, objectives, and beneficial uses have been met in receiving waters. Permittee-directed hydromodification monitoring will typically focus on this second priority area. However, as stated above, because regulatory compliance may be obtained by achieving overall watershed health, compliance and watershed condition monitoring must be coordinated at every level and by all responsible parties.

To address the two priority management areas discussed above, a Hydromodification Monitoring Plan should include the following attributes:

Plan is question-driven and has clear assessment endpoints. All components of design and data collection should support the core management questions.

Plan is multidimensional. Different factors should be designed to answer the various core questions (e.g. receiving water monitoring, BMP monitoring).

Multiple indicators are used. Using multiple hydrologic, physical, and biological indicators to assess effects of management actions provides a more robust assessment and increases the ability to diagnose potential stress-response relationships. In some cases the primary stressors may be something other than hydromodification. It is important to note that some indicators may only apply in certain types of streams (e.g. benthic invertebrates in wadeable streams).

Plan is modular. A modular design allows elements to be implemented in a phased or incremental manner and to build on existing programs. Different aspects can be implemented based on interest and management information needs. It may not be necessary (or desirable) in some cases to implement all elements of the monitoring program concurrently. A modular design also allows the level of effort to be adjusted commensurate with factors such as the value of resources at risk, the level and certainty of effects, monitoring priorities, and the availability of funding. It also allows for iterative refinement of the overall program based on early monitoring results.

Plan is consistent with other regional programs. Common monitoring protocols allow for consistent application from project to project and across different programs. Data consistency will also allow information to be compiled across programs to build larger, more robust, long-term monitoring data sets that can be readily compared. A consistent regional approach will require development of common quality control procedures and information management/data transfer protocols.

Plan is adaptive. Monitoring data should be directly tied back to the core questions in order to assess the effectiveness of management actions. Monitoring results should be used to inform changes in the selection and implementation of management strategies, to support regional watershed models, and to adapt future monitoring priorities. This will require coordination between the various entities implementing hydromodification monitoring. Adaptive feedback is particularly important for hydromodification because management techniques are relatively new and approaches are expected to evolve over time based on early implementation experience (Figure 3).



Figure 3. Adaptive feedback relationship between monitoring and other elements of hydromodification management.

1.3 Primary Monitoring Questions

The specific monitoring design is guided by monitoring for each of the four elements discussed above. When developing a tiered approach to hydromodification monitoring it is advisable to analyze the highest priority element(s) and focus resources in that area. Six primary monitoring questions are recommended in order to adequately address all elements of the monitoring framework keeping in mind that every Hydromodification Monitoring Plan should be designed to meet local needs. The following management questions should be considered in the plan development process.

1.3.1 Questions Answered through Local-Agency Led Monitoring over Shorter Timeframes Performance Assessment

- 1) How well do various BMPs, control strategies and management measures perform relative to their design expectations and in light of how well they are maintained?
- 2) What factors influence the efficacy of hydromodification management strategies?

Effectiveness Assessment

- 3) How effective are specific management strategies at protecting the physical and biological integrity of streams from the effects of hydromodification (in the context of other watershed stressors)?
 - a. How do these effects compare to patterns at unimpacted “reference¹” sites?
 - b. Are the management strategies sufficiently protective of all stream types?
 - c. How does effectiveness vary by stream type (e.g. substrate, planform, slope)?

1.3.2 Questions answered through regional/programmatic monitoring over longer timeframes Spatial and Temporal Trends Assessment

- 4) What is the spatial footprint of response to hydromodification effects or management actions relative to discharge locations?
 - a. How far up or downstream do potential effects of hydromodification persist?
- 5) How do responses to hydromodification management vary over time?
 - a. What is the effect of natural rainfall and runoff patterns on stream response in the presence or absence of management measures?
 - b. How long do “restored” or “rehabilitated” stream reaches take to recover following remediation?
 - c. How do responses vary based on stream type (e.g. substrate, planform, slope) and environmental setting (e.g. watershed position relative to upstream land use, floodplain condition)?

Ambient (Characterization) Monitoring

- 6) What is the physical and biological condition of streams relative to established regulatory or management objectives?
 - a. How does condition vary by stream type (e.g. substrate, planform, slope) and environmental setting (e.g. watershed position relative to upstream land use, floodplain condition)?

Questions #1 to #3 should be the focus of a local agency/permittee-directed hydromodification monitoring program, but can benefit by regional cooperation with other entities. Questions #4 to #6 should be addressed through coordination of hydromodification monitoring with a watershed or regional monitoring program involving multiple entities at the state, regional and local levels. The latter questions can only be answered through long-term sustained monitoring. This is particularly true since hydromodification effects may only occur under specific circumstances (e.g. storms of certain size or duration). Long-term (multi-decadal) data sets will be necessary to separate effects of management actions (or lack thereof) from natural variability in channel conditions. It should be noted that the approach to answering these questions can also apply to the objectives of other monitoring programs

¹ Reference is currently defined as “minimally affected by human activities” in the Reference Condition Management Program (Ode et al. 2009). Where possible, regional reference sites can be used.

under NPDES permits, watershed plans, or regional monitoring programs. Integration of hydromodification monitoring with other monitoring efforts should be a priority, with the ultimate goal being an integrated watershed-scale monitoring and assessment program. Such a program would allow for sharing of reference sites, sampling sites and information across programs and jurisdictions in order to allow leveraging of effort/information and more coordinated management responses. This involves mapping the location and type of various monitoring efforts and developing mechanisms for data sharing. Monitoring implementation should include time to develop and sustain the necessary inter-departmental and/or inter-agency coordination associated with the integrated monitoring approach.

It is important to note that hydromodification has the potential to affect all water body types; therefore, hydromodification management and the associated monitoring should address potential effects to all streams and receiving waters. Because streams are most directly affected by hydromodification, they have been the focus of current regulatory requirements and, therefore, most management programs. Consequently, this document emphasizes tools and approaches applicable to fluvial systems, which are broadly defined to include wadeable streams, large rivers, headwater streams, intermittent and ephemeral drainages, and alluvial fans (although new specific tools may be necessary for assessment and management of alluvial fans). We recognize, however, that hydromodification can also affect nearshore and coastal environments, including bays, harbors, and estuaries, by altering estuary channel structure, water quality, sand delivery, siltation, and salinity. These effects have been less extensively studied or documented and have received substantially less attention in current hydromodification requirements. Future efforts should more directly address hydromodification effects to all receiving waters, but the information is not presently available to provide equally comprehensive guidance here.

1.4. Adaptive Monitoring through Hypothesis Testing

As with all monitoring programs, this plan should be adaptive. Early monitoring results should be used to refine questions and the associated monitoring design over time. For a plan to be truly adaptive the core questions must be predicated on a set of testable hypothesis. Not every hypothesis can be fully tested at all times; however; they provide a consistent framework for the development of adaptive monitoring designs.

1.4.1 Hypotheses that Drive the Monitoring Plan

Performance Assessment

BMPs will perform as designed over a range of storm conditions and will be maintained adequately to perform effectively.

Effectiveness Assessment

Specific management strategies can help protect the physical and biological integrity of streams from the effects of further hydromodification.

Flow duration control is better than no control or peak flow control at reducing impacts, but effectiveness will be influenced by site conditions.

Management practices that contribute to dynamic channel stability, also contribute to healthy biotic communities.

The effectiveness of flow duration control based BMPs at preventing excessive erosion/channel instability will vary based on the degree of change in sediment supply.

Spatial and Temporal Trends Assessment

Hydromodification management will promote dynamic stability of channels and natural fluctuations in cross-section and planform that are similar to streams from minimally impacted areas.

Hydromodification management will protect against upstream or downstream propagation of channel erosion or deposition.

Ambient Condition (Characterization) Monitoring

Hydromodification management measures will allow streams to meet objectives established under watershed plans or regulatory requirements.

Stream or receiving water type, bed-material, slope (landform), and geologic setting, as well as past, present, and future land use determine overall watershed processes and influence the degree to which hydromodification effects may be manifested.

2.0 GENERAL MONITORING APPROACH

Answering the core questions requires different design approaches, several suites of indicators, and varying time scales, frequencies and durations. The basic monitoring elements are summarized in Table 2 and discussed in detail in the following sections. *As noted above, the overall monitoring program can be implemented in a modular or phased manner and does not need to be implemented all at once.* Specific questions can be addressed as they become relevant or as preliminary data suggests that more intensive monitoring would be beneficial. Also as noted above, the permittee-directed monitoring should focus on performance effectiveness assessment. Permittees should cooperate with integrated regional monitoring programs to answer spatial and temporal trends and overall characterization questions. It is important to note that separating the effect of hydromodification management over time from natural patterns of channel evolution will require long-term (multi-decadal) monitoring, which is often beyond the timeframe typically associated with traditional water quality monitoring programs.

Design of a monitoring program (as well as decisions regarding management actions) can benefit from watershed analysis that summarizes the general condition of various areas, and identifies opportunities and constraints. Watershed analysis should begin with a documentation of watershed characteristics and processes, and past, current, and expected future land uses. The current condition of streams and their response trajectories should be examined in the context of past alterations to streamflow, sediment delivery, and direct manipulations of physical habitat such as channel straightening and armoring. The analysis should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects. The combination of watershed and site-based analyses should be used to establish clear objectives to guide monitoring and management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed and should prioritize areas for protection, restoration, or management. Strategies to achieve these objectives should be customized based on consideration of current and expected future channel and watershed conditions. For example, stream restoration is probably not a viable option if substantial changes in upstream water and sediment delivery are anticipated in the future. A one-size-fits-all approach should be avoided. Even where site-based control measures, such as flow-control basins, are judged appropriate, their location and design standards should be determined in the context of the watershed analysis. Maps and landscape-scale data produced as part of the watershed analysis should inform the hypothesis and management questions upon which monitoring programs are based. Similarly, interpretation of monitoring data should rely on insights and understanding provided by watershed analysis. Watershed analysis provides a critical foundation for monitoring programs, but is often neglected due to time or resource constraints. Efforts should to include this important step will provide long-term benefits in terms of program design and interpretation of results.

Table 2. Summary of recommended monitoring design elements.

Monitoring Question	Design	Location criteria	Season	Frequency	Duration	Sampling triggers	Indicators
Performance Assessment							
1) How well do various controls strategies and management measures perform relative to their design expectations	targeted	location of regional or site-specific BMPs + undeveloped reference sites	storm season	annually for first 5 years after installation	periodically after first 5 years based on performance	enhance monitoring following large storms or substantial changes in land use	inflow and outflow rates from BMPs over storm duration, flow and x-secs immediately d/s of BMPs + comparable reference site data
2) What factors influence the efficacy of hydromodification management strategies?	map/GIS based + review of targeted data	watershed wide GIS + evaluation of data from specific settings	N/A	once at the start of monitoring program and then updated periodically based on changes in land use/infrastructure		substantial changes in land use, infrastructure or other watershed attributes	GIS, supported by field based stressor identification
Effectiveness Assessment							
3) How effective are specific management strategies at protecting the physical and biological integrity of streams from the effects of hydromodification?	Targeted w/BACI design	upstream and downstream of selected BMPs, multiple locations	dry season and continuous flow measures	annually for first 5 years	after yr 5, integrate with regional monitoring	enhance monitoring following large storms or substantial changes in land use	screening tool measures, physical habitat assessment, bioassessment, channel cross-sections, flow
Spatial and Temporal Trends Assessment							
4) What is the spatial footprint of hydromodification responses relative to discharge locations?	targeted	upstream and downstream of selected BMPs, multiple locations	dry season	every 2-3 years	ongoing	increase frequency following large storms & substantial change in land use	screening tool measures, physical habitat assessment, bioassessment, channel cross-sections
5) How do responses to hydromodification management vary over time?	targeted	sentinal or integrator sites + reference sites	dry season and continuous flow measures	every 2-3 years	ongoing	none	screening tool measures, physical habitat assessment, bioassessment, channel cross-sections, flow
Characterization Monitoring							
6) What is the physical and biological condition of streams relative to established regulatory or management objectives?	probabalistic + sentinal sites	stratified by stream type or management unit + reference and integrator sites	dry season	annually in a rotating design	ongoing	possible intensification following stochastic events such as floods or fires	screening tool measures, physical habitat assessment, bioassessment
<i>screening tool measures</i> = cross sections, bed material composition, floodplain width, bank height & angle, grade control, Channel Evolution Model (CEM) class							
<i>bioassessment</i> = benthic macroinvertebrates, algae, California Rapid Assessment Method (CRAM)							
<i>GIS</i> = land use, structures, channel types, Channnel Evolution Model (CEM) classes if available							
<i>BACI</i> = Before-after-control-impact							

2.1 Monitoring Design and Site Selection/Location Considerations

The overall monitoring plan includes two basic designs: targeted and probabilistic sampling. Targeted sites include reference sites, sentinel sites, and sites downstream of specific BMPs or other management actions (e.g. restoration areas). A summary of the relationship between site types and monitoring questions is provided in Table 3.

Targeted sites should be selected in order to best evaluate the specific management questions.

Targeted sites include those used to evaluate effects of management actions and those that serve as watershed reference sites. In addition, the following general criteria should be considered:

- Appropriate scale: the upstream area should be dominated by, or at least significantly affected by, the management action of interest.
- Responsiveness: at the chosen location, the indicators being measured should be amenable and relatively sensitive to change in response to the management action.
- Representativeness: the results at the chosen location should be credibly extrapolated to “similar” sites, and those sites in aggregate should constitute a widespread (or otherwise important) subset of the landscape as a whole.
- Access: the site should be easily and safely reached by the appropriate personnel and equipment, and with a cost of doing so consistent with the frequency of measurements being made. Any equipment left unattended needs to be secure from theft or vandalism, or must be well-hidden.

Probabilistic sites should be selected at random using methods developed by the USEPA and the Stormwater Monitoring Coalition (SMC; Stevens et al. 1997, USEPA 2002, SCCWRP 2007). Randomly selected sites can be stratified into groups based on physical setting, management priorities, or specific assessment questions. An existing “master sample draw” has been developed in southern California as part of the SMC’s regional watershed monitoring program. This existing draw can be used to provide an unbiased set of site locations to support the ambient characterization monitoring under Question #1. This will also facilitate coordination of hydromodification monitoring with existing regional and NPDES required monitoring.

Routine review of aerial and ground-based photography can also be a powerful and relatively inexpensive tool to help select probabilistic sites and support monitoring programs. Aerial photography can be used to identify areas of the watershed analysis that require updating due to changed conditions. Aerial photographs can be used to evaluate floodplain width, planform changes, channel migration, and floodplain obstructions or constrictions (either natural or anthropogenic). This information can provide a screening level evaluation of condition that can be used to prioritize locations for more specific ground-based monitoring. Aerial photographs are also important for reconnaissance of candidate sites for ambient condition assessment (Question #6). They can also provide a general overview of the

condition of the site over time (e.g. before and after construction of a BMP), can help refine specific field sampling locations, and are a relatively easy way to support assessments of potential causes of effects (Question #2), spatial extent of effects (Question #4) and trends (Question #5).

Efforts should be made to coordinate the locations of both probabilistic and targeted hydromodification monitoring sites with sites being used for other monitoring programs. This may or may not be possible given the specific needs of different programs in terms of site types, flow conditions, locations etc. However, where possible sharing sites between programs can increase efficiency and reduce costs. In addition, Questions #1, #5, and #6 involve comparison to relatively unimpacted reference sites as a means of increasing the power to detect effects (Loftis et al. 2001). Selection of these sites can be based on the existing Reference Condition Management Program (Ode et al. 2009) and informed by the watershed analysis described above.

Table 3. Relationship between monitoring questions and types of sites used to answer each question. Shading indicates that the specific site type is used to answer the indicated monitoring question.

		Monitoring Question					
		Performance		Effectiveness	Spatial		Characterization
		1	2	3	4	5	6
Type of Site		How well do various controls strategies and management measures perform relative to their design expectations	What factors influence the efficacy of hydromodification management strategies?	How effective are specific management strategies at protecting the physical and biological integrity of streams from the effects of hydromodification?	What is the spatial footprint of hydromodification responses relative to discharge locations?	How do responses to hydromodification management vary over time?	What is the physical and biological condition of streams relative to established regulatory or management objectives?
Reference sites		developed sites with no BMPs					
Provide context							
Differentiate effects from natural variability							
BMP monitoring sites							
Evaluate performance relative to goals			short term				
Evaluate compliance							
Targeted and sentinel sites							
Evaluate effectiveness of management actions			short and long term				
Evaluate spatial and temporal trends							
Probabilistic							
Provide regional context			Long-term				
Interpret long-term trends							
Help understand natural variability							
GIS analysis							
provide spatial context							
provide insight into causal factors							

2.2 Monitoring Season, Duration, and Frequency

Most monitoring questions can be answered via data collected during the non-storm (dry season). The exception is the evaluation of BMP performance and other measures of stormflow or sediment transport, which will typically occur during the storm flow conditions. Questions #1 to #3 can initially be evaluated over the five-year timeframe associated with a typical permit cycle; however, in many cases several permit cycles may be necessary to fully address these questions. The time necessary to answer these questions may be longer based on several factors that are often out of the control of permittees. For example, BMP performance and stream response may require rainfall patterns necessary to trigger specific size flow events, which may only occur periodically. Second, the pace of development and redevelopment may influence when BMPs or other management measures are constructed and can then be monitored.

Questions 4-6 will need to be evaluated over longer time periods (i.e. multiple decades) as part of a regional monitoring program; often relatively long monitoring periods (>10 - 15 years) are required to detect change (Loftis et al. 2001). A subset of sites used to address Questions #1 to #3 may be rolled into long-term regional monitoring programs. *Finally, the value of long-term flow data should not be underestimated, particularly for evaluating the effects of hydromodification management. Establishing flow monitoring stations at key locations should be a high priority for hydromodification monitoring programs.*

2.3 Monitoring Indicators

Field indicators need to meet several objectives. First, the monitoring program should include indicators of pressure, state and response (Figure 4). Pressure indicators measure factors that can cause a response in the stream channel, such as flow. Stream flow is the first link in the causal chain between management practices and stream response. State indicators measure the physical condition of the stream and should include measures that are able to provide an early detection of potential channel response, such as shifts in the composition of the bed material or channel morphology. Physical habitat is determined by interactions between flow and channel structure; therefore, it is necessary to monitor state indicators of the geomorphic characteristics that mediate the effects of hydromodification on biological endpoints. Response indicators measure the ecological endpoints of concern from a management perspective, and should include long-term integrative measures of condition, such as benthic macroinvertebrates and algae. The pressure-state-response approach to monitoring means that the monitoring program will include measures of hydrology, geomorphology, and biology, as described below.

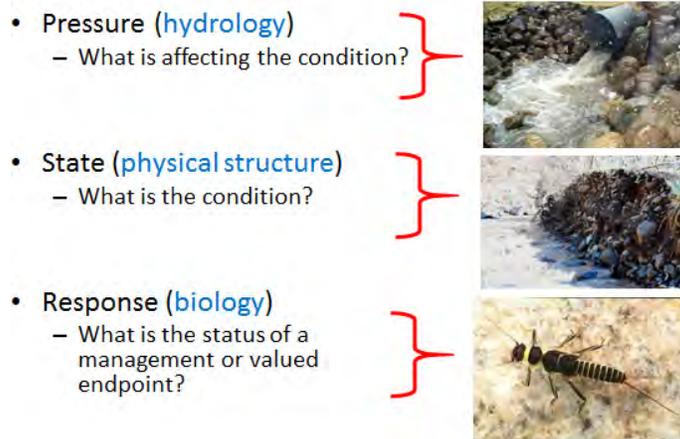


Figure 4. Pressure-state-response approach to monitoring.

In a general sense, response variables measure the overall “health” of a stream and are used to make decisions as to whether intervention is necessary to improve overall condition. State variables provide insight into the physical conditions that affect biological response variables. Together, state and response variables can be used to help prioritize where management action is necessary and how intensive that management action should be. Pressure variables provide insight into “what needs to be changed” to improve stream condition, and (together with state variables) can be used to guide specific management responses (e.g. altering flow conditions).

It is important to note that many stream channels of concern that are impacted by hydromodification will be ephemeral or intermittent, particularly in Southern California. Some commonly used bioassessment indicators (e.g. benthic macroinvertebrates) may not be usable in extremely dry streams (such as those without persistent baseflow through the spring). In such cases, other indicators such as those included in the California Rapid Assessment Method (CRAM; CWMW 2012) will apply. In addition, monitoring entities may want to include general habitat assessments, including several metrics contained in the California Physical Habitat Protocol (Ode 2007) to evaluate biological condition of streams. As new bioassessment indicators for intermittent and ephemeral streams are developed, they can be added into existing programs.

Stressors other than hydromodification (e.g. pollutant discharges, invasive species infestations) may contribute to changes in stream condition. Consequently, many of the indicators used may be responding to multiple factors. This should be accounted for during analysis and interpretation of monitoring data and should be used to identify opportunities for cooperation with other monitoring and management programs.

The selected indicators should be practical from a cost and logistics perspective, have an established scientific basis, have direct ties to designated uses, have existing protocols available, and provide information that can serve broader monitoring objectives beyond hydromodification assessments. In

many cases, the recommended indicators may already be included in existing monitoring programs. Recommended field indicators are summarized in Table 4 and discussed in detail below.

Table 4. Summary of recommended field indicators along with their assessment endpoints and the monitoring questions that they support.

	Variable Type			Assessment Endpoint	Monitoring Questions
	P	S	R		
Hydrologic Indicators					
Stream flow				long term flow magnitude and duration	3, 4, 5
BMP inflow and outflow				discharge magnitude and duration	1, 5
Geomorphic Indicators					
Bed material composition				substrate size as d50	3, 4, 5, 6
Armoring potential				dominant substrate type and interstitial material	3, 4, 5, 6
Grade control				presences, spacing and condition of grade control	3, 4, 5, 6
Incision/downcutting risk				potential specific stream power relative to d50	3, 4, 5, 6
Probability of mass wasting				critical bank height and bank angle	3, 4, 5, 6
Evidence of fluvial erosion				evidence of erosion at the toe of slope	3, 4, 5, 6
Consolidation of bank material				field penetration tests of banks	3, 4, 5, 6
Channel width:valley width				active channel vs. floodplain	3, 4, 5, 6
Channel Evolution Model class				field observations of CEM class	3, 4, 5, 6
Channel geometry				channel cross-sections and longitudinal profile	1, 3, 4, 5
Physical Habitat Assessment (PHAB)				standard PHAB metrics	3, 4, 5, 6
Biologic Indicators					
Benthic macroinvertebrates				IBI, component metrics, functional groups	3, 4, 5, 6
Stream algae				IBI, component metrics, functional groups, biomass	3, 4, 5, 6
California Rapid Assessment Method				index score, attribute scores, metric scores	3, 4, 5, 6
<i>P: pressure variable</i> <i>S: state variable</i> <i>R: response variable</i>					

2.3.1 Hydrologic Indicators

Stream Flow

Stream flow can be a pressure variable in that it affects physical and biological condition of the channel. It can also be a state variable to the extent that it describes the environment in which biota live and directly respond. Continuous flow monitoring is an important element of effectiveness monitoring. In addition, the magnitude and duration of erosive flow events at targeted locations should be measured during storm events; monitoring should commence prior to increase in flow in response to stormwater runoff and continue through peak flow until discharge falls below a threshold of significant sediment transport. Flow should be measured at a portion of the channel with a well-defined cross-section, with relatively uniform flow, and that does not experience hydraulic backwater effects, that can be used to rate flow (i.e. relate water surface elevation to discharge). These constraints should be considered when selecting monitoring locations in channels with multiple or distributed flow paths. Technical guidance on open channel flow measurement methods is available from the USGS, USDA Bureau of

Reclamation, USEPA and numerous State water-quality monitoring program websites. A summary of guidance on measuring streamflow is provided in Appendix A.

BMP Inflow and Outflow

Outflow characteristics from site-specific or regional BMPs are pressure variables. Inflow and outflow should be monitored following representative storms and compared to the design standards of the BMP or basin. A subset of representative BMPs or other facilities could be subject to ongoing monitoring beyond the initial performance assessment period. Consideration must be given to monitoring requirements during BMP design/site permitting/BMP construction, in order to accommodate continuous outflow measurements. Technical guidance on pipe flow measurement methods is available from the USGS, USDA Bureau of Reclamation, USEPA and numerous State water-quality monitoring program websites.

As a pressure variable, stream flow and BMP outflow are factors that can be directly affected by management measures. Therefore, they can be used as proximate measures of the effect of those management measures and as compliance points.

2.3.2 Geomorphic Indicators

Screening Tool Indicators

The Hydromodification Screening Tool developed by SCCWRP and Colorado State University (Bledsoe et al. 2010, 2012) provides a set of relatively simple to measure, but quantitative, field indicators designed to provide a rapid assessment of the relative susceptibility of a specific stream reach to effects of hydromodification. These same field indicators should be used as state variables to assess general condition of a stream reach relative to hydromodification effects. The screening tool includes the following field indicators, with more detail available in Bledsoe et al. 2010:

- Bed material composition, expressed as d_{50}
- Armoring potential measured as combination of dominant substrate type and interstitial material
- Presence and condition of grade control
- Incision/downcutting risk based on the potential specific stream power relative to d_{50}
- Probability of mass wasting based on critical bank height and angle
- Evidence of fluvial erosion at the toe of bank
- Consolidation of bank material
- Width of the active channel relative to the overall valley width
- Channel condition relative to the state of the Channel Evolution Model (Hawley et al. 2012)

Channel Geometry

Channel cross-sectional area and longitudinal profile is a state variable and often serves as an assessment endpoint for determining hydromodification response or recovery. Geomorphic surveys of channel cross-sections should be guided by the field protocol of Harrelson et al. (1994) and performed

by a knowledgeable/experienced survey crew using a total station and data collector or level/rod. Surveys should occur over 10 bankfull channel widths. Surveys should include at least three cross-sectional profiles (upper, mid, lower reach) that extend to either the valley edge or above the apparent 25 year floodplain. Channel surveys and photo points looking upstream and downstream should be tied to “permanent” control points or monuments tied to a geodetic framework (such as NAD 27 or 83).

Physical Habitat Assessment (PHAB)

PHAB data can serve as a pressure or state variable. The PHAB protocol (Ode 2007) is part of the standard bioassessment procedures already conducted as part of many compliance and ambient monitoring programs. PHAB measures a series of physical channel characteristics, riparian, substrate, and human alterations along 11 transects over a 150 to 200 m stream reach. These data are converted to “metrics” used to evaluate the general condition of physical habitat and the suitability of the stream to provide habitat for benthic macroinvertebrates. These same metrics provide insight into stability or response of the stream channel to hydromodification effects.

State variables are monitored for several reasons: 1) they provide a measure of the physical condition of channels relative to hydromodification and thus can be used as measures of compliance or effectiveness of management measures; 2) they indicate areas that require management attention and therefore help guide and prioritize management measures; and 3) they help link pressure variables, such as flow, with response variables, such as biology and therefore help provide mechanistic insight how stream ecosystems respond to hydromodification and hydromodification management.

2.3.2 Biologic Indicators

Benthic Macroinvertebrates

Benthic macroinvertebrate community composition and indices of biological integrity (IBIs) are response variables that can be used to assess overall health of instream communities. As with PHAB, benthic macroinvertebrate assessments are routinely conducted as part of many existing ambient assessment and compliance monitoring programs. Benthic macroinvertebrates shall be collected using the multi-habitat method described in the SWAMP protocol (Ode 2007). Identifications will be done according to the Standard Taxonomic Effort Level 2 for California benthic macroinvertebrates, as described in Richards and Rogers (2007). Benthic macroinvertebrate assessments can be done in perennial wadeable streams and non-perennial streams with persistent baseflow through the spring sampling index period. Other biological indicators such as fish or plants will need to be developed and/or used in streams with deep water flow and in ephemeral streams.

Stream Algae

Bioassessment tools based on instream algae are another response variable often used in concert with benthic macroinvertebrates to assess overall instream health relative to known stressors. Algal bioassessment includes measures of soft-bodied algae, cyanobacteria, and diatoms. Assessments are typically conducted in two ways; biomass and taxonomic identification. Algae are collected using the multi-habitat method described in the SWAMP protocol (Fetscher et al. 2009). As with the benthic

invertebrates, algal assessment can be done in perennial wadeable streams and non-perennial streams with persistent baseflow through spring sampling index period.

[California Rapid Assessment Method \(CRAM\)](#)

CRAM assessments include pressure, state and response variables. CRAM is a standardized assessment method that typically can be completed by a two-person crew in less than four hours in the field per site. It evaluates general conditions relative to four attributes (landscape context, hydrology, physical structure, biological structure) based on a set of structured field observations and includes an evaluation of stressors that may affect condition. CRAM applies to perennial and non-perennial streams and assessments are conducted during the spring-summer plant growing season. Protocols for CRAM assessments are provided in the CRAM user's manual version 6.0 (CWMW, 2012) and on the CRAM website at www.cramwetlands.org.

Response variables measure the biological health of streams, which is the ultimate desired management endpoint. A primary goal of water quality programs is to protect and restore instream biology, so measuring it directly is a direct measure of success. Furthermore, regulatory programs, such as freshwater bio-objectives, increasingly use biological endpoints as compliance measures.

2.3.4 GIS Indicators

GIS indicators should be developed as part of the watershed analysis described above and should include factors that both control and affect watershed processes. Key GIS indicators will include:

- Topography and valley slopes based on the digital elevation models
- Surficial geology from USGS or the California Geologic Survey
- Soil types and infiltration/drainage/runoff characteristics from NRCS or local data
- Land use/land cover from the National Land Cover Database or higher resolution local data
- Existing channel conditions and mapped channel structures
- Channel widths relative to floodplain widths (including floodplain restrictions and obstructions)
- Existing flood control facilities and water quality or flood control basins
- Locations of BMPs, restoration projects and other management actions
- Footprint of regional fires (updated annually)
- Areas of particular environmental, economic, social, or management concern

3.0 SPECIFIC MONITORING APPROACHES

Each of the six monitoring questions (listed in Section 1.3) includes specific design considerations such as specific site selection criteria, frequency and duration of sampling, triggers to initiate monitoring events, and priority indicators. These elements are discussed for each question in the subsections below. As noted above, the elements should be viewed as modules that can be implemented in various combinations and at various timeframes based on need and resource constraints. It is not necessary (nor may it be desirable) to implement all elements at the onset of a monitoring program. Phased implementation allows for adaptation and prioritization. Hydromodification monitoring should be coordinated with other monitoring efforts where there is overlap (e.g. other stormwater programs, water quality certifications under Section 401 of the Clean Water Act, ambient stream monitoring).

Performance Assessment (Local Agency/Permittee Directed)

3.1 Question #1

How well do various controls strategies and hydromodification management measures perform relative to their design expectations?

This is the main question used to evaluate the performance of representative BMPs or other hydromodification management measures. Effectiveness is evaluated by measuring inflow and outflow characteristics from management areas (e.g. floodplain restoration sites, basins)² or BMPs, relative to design parameters. Where possible, continuous flow monitoring should be conducted for the first several years following BMP installation and as an ongoing measure for large or regional BMPs. Understanding the performance of management measures is an important component of regulatory compliance. Results from this question should be used to adapt and improve management practices over time in order to inform future decisions about the design and placement of BMPs. Performance of management measures is a core element of adaptive management that will increase the ability to protect and restore stream channels into the future.

3.1.1 Design and Location Criteria

BMP performance is best achieved through targeted sites located at the outflow of BMPs or other management measures. . In some instances, BMP performance assessment may be pooled regionally instead of conducted within each Watershed Management Area. Data from these sites is used to evaluate their performance relative to design criteria and in the receiving channel downstream of the BMP. Post construction/implementation, representative BMPs should be monitored to determine if they are performing as intended and/or if modifications are necessary to achieve desired performance. Over the long-term a subset of the representative sites could be monitored to aid in evaluation of trends and long-term performance patterns over a variety of climatic and site conditions. Sites should be selected to represent the categories or types of facilities required and/or constructed based on permit

² Management measures may include BMPs or other facilities, locations of floodplain or stream restoration, or alternative land use practices designed to mitigate the effects of hydromodification.

requirements and watershed plans. These categories should include both site-based and regional facilities and those with different design goals (e.g. flow-duration control, retention/infiltration, capture/use, sediment management).

3.1.2 Sampling Season, Frequency, and Duration

Performance monitoring should occur during the storm season because most hydromodification BMPs are designed to help manage stormwater runoff. It is preferable to have continuous flow monitoring occur throughout the storm season for several years following installation in order to provide robust information on representative BMP performance. If this is not possible, at least three storms should be monitored per season. Continuous flow measurements should be initiated at the start of each monitored storm event and continue until all retained water has been discharged from the facility or infiltrated. A subset of representative BMPs and reference sites should be monitored annually to assess performance relative to design specifications.

3.1.3 Specific Sampling Triggers

Monitoring should be initiated based on two triggers. First, each new facility that is not already included in the set of representative BMPs should be monitored. The immediate downstream areas should also be monitored (for representative BMPs). Second, monitoring intensity should be increased following major storm events that may influence BMP performance. If the preferred continuous flow monitoring approach is used, it will provide information over a range of conditions representing seasonal and episodic variability, eliminating the need to increase monitoring intensity following large storms.

3.2 Question #2

What factors influence the efficacy of hydromodification management strategies?

Improved management over time comes from an understanding of the factors that affect the effectiveness of various management actions. Information gained from other monitoring can only be interpreted through such an understanding. Therefore, such “causal evaluation” is an integral part of a comprehensive monitoring program. Evaluation of factors that affect performance is best done through a GIS-based landscape assessment, supported by targeted field evaluation of potential stressors (or pressure indicators). In practice, the outcome of Questions #2 and #3 should be used together to support causal assessment that informs management decisions. This assessment should use much of the same information compiled as part of the watershed analysis that forms the foundation of the overall monitoring program. GIS indicators should be supplemented by field documentation of stressors observed during monitoring activities associated with the other management questions. In particular the CRAM stressor checklist, PHAB, and flow data can provide field-derived insight into the causes of decline or recovery of a particular stream reach.

3.2.1 Design and Location Criteria

Causal assessment is not monitoring in the true sense, but occurs through targeted assessment of potential causes of failure or factors that contribute to success. This evaluation should occur at the watershed scale and consider all upstream and downstream contributing factors. The watershed analysis that forms the foundation of the integrated monitoring program can form the basis of this assessment. In addition, causal evaluation frameworks such as the USEPA Causal Analysis/Diagnosis Decision Information System (CADDIS, <http://www.epa.gov/caddis/index.html>) can be used to evaluate past data sets and provide insight into causes of management measure effectiveness. Results of the watershed-scale analysis may suggest targeted locations for more detailed investigations where field based measures can be used to support the causal evaluation.

3.2.2 Sampling Season, Frequency, and Duration

Because this question is answered mainly through GIS analysis it can occur in ongoing and as-needed manner. As results are obtained from the other monitoring questions, this analysis should be updated and revised to improve understanding of causes of success and failure.

3.2.3 Specific Sampling Triggers

As with other questions, the analysis of causation should be intensified following substantial changes in land use practices or following installation of new management measures. Unlike other questions, natural catastrophic events such as fires and floods would not necessarily trigger intensified causal assessment. Additional field assessment should be triggered if performance monitoring under Question #1 reveals that individual (or groups) of BMPs are not functioning as intended.

Effectiveness Assessment (Local Agency/Permittee Directed)

3.3 Question #3

How effective are specific management strategies at protecting the physical and biological integrity of streams from the effects of hydromodification?

The efficacy of management measures is a function of BMP performance (Question #1) and the effect of those management actions on instream conditions (Question #3). A combination of physical and biological measures taken at channel cross-sections downstream of the BMPs can be used to evaluate effectiveness (Table 5). These measures can be evaluated against comparable assessment conducted prior to the BMP being installed and to unimpacted reference locations³. Results from this question should be used to adapt and improve management practices over time in order to inform future

³ In some watersheds, it may be difficult to find unimpacted reference sites. In this situation regional reference sites may be used (hence the importance of maintaining reference networks). Pre-project data is especially important when reference sites are difficult to locate.

decisions about the design and placement of BMPs. This is a core element of adaptive management and will hopefully increase ability to protect and restore stream channels into the future.

Table 5. Field indicators for measuring effectiveness of hydromodification management.

Geomorphic Indicators	Biologic Indicators
Bed material composition	Benthic macroinvertebrates
Armoring potential	Stream algae
Grade control	California Rapid Assessment Method
Incision/downcutting risk	
Probability of mass wasting	
Evidence of fluvial erosion	
Consolidation of bank material	
Channel width:valley width	
Channel Evolution Model class	
Channel geometry	
Physical Habitat Assessment (PHAB)	

In addition, as stated above, long-term continuous flow data will be valuable in assessment of BMP effectiveness.

3.3.1 Design and Location Criteria

A before-after-control-impact (BACI) design (Stewart-Oaten et al. 1986) is recommended for assessing hydromodification management effectiveness. Targeted stream reaches downstream of BMP locations should be sampled prior to and after BMP installation/construction (at least 2 seasons of pre-BMP sampling are recommended). The condition of the stream channel receiving the BMP discharge should be considered when deciding where to monitor effectiveness. For example, BMPs that discharge into engineered channels or streams subject to a variety of other stressors may not be appropriate for effectiveness monitoring. Instead, effectiveness monitoring should be prioritized in areas where BMPs discharge to soft-bottom channels where the influence of other stressors is relatively minimal.

If possible, a set of reference sites should also be selected that receive runoff from relatively natural landscapes. The paired design increases statistical power to detect differences associated with management actions from natural variability associated with seasonal and decadal scale climate patterns. Because different channel types will respond differently, different channel susceptibility classes should be included for reference sites and streams downstream of BMPs (i.e. high, medium, low according the screening tool developed by Bledsoe et al. 2010). If possible to obtain, three replicate reference sites should be included for each major channel category. Reference sites are also an important component of trends monitoring (see Question #5). Therefore, to the extent possible, these sites should have ownership and access conducive to long-term ongoing monitoring.

3.3.2 *Sampling Season, Frequency, and Duration*

Instream conditions can be evaluated during the dry season when appropriate to sample biological indicators. Channel cross-sections should be taken at least annually for the first five years following BMP installation/construction (frequency may increase following catastrophic events, see below). If possible, continuous flow monitoring stations should be installed in order to accurately capture hydrograph shapes even in small, flashy basins. Following the initial monitoring period a subset of representative sites (and reference sites) should be monitored annually as part of long-term (decadal) regional monitoring programs. Long term monitoring is important as there may be a substantial lag time between land use changes and/or initial management actions and stream responses.

3.3.3 *Specific Sampling Triggers*

Monitoring should be initiated based on two triggers. First, construction of each new representative BMP should initiate monitoring of that BMP (Question #1) and the immediate downstream area (in addition, to the recommended pre-construction monitoring) – for a representative set of sites. Second, monitoring intensity should be increased following major storm events or fires. Following these events, sites should be monitored more frequently within a storm season (i.e. number of storms per year should increase) for the first three years following the catastrophic event. The need for continuing high intensity monitoring beyond this time period should be evaluated based on the results from the first three years.

Spatial and Temporal Trends Assessment (Cooperative Statewide or Regional Monitoring)

Questions #4 and #5 can only be answered through long-term coordinated monitoring that crosses jurisdictional boundaries. Therefore, these questions should be addressed through cooperative programs at the state or regional level (e.g. southern California) that is coordinated by appropriate state or regional agencies. It is recommended that a pilot project focusing on Questions #4 and #5 be conducted first prior to implementation on a larger scale

3.4 Question #4

What is the spatial footprint of hydromodification responses relative to discharge locations?

Hydromodification effects have the potential to propagate upstream or downstream from a discharge location. Therefore, assessing the success of management measures requires an evaluation of the spatial extent of effects. This is best accomplished through a long-term regional monitoring program. Spatial effects are monitored during the dry season at a series of targeted location along a stream corridor. Measures include channel cross-sections and the same physical and biological indicators used to evaluate effectiveness (Question #3, see Table 3). In some cases the same sites may be used to answer spatial extent and effectiveness questions. Results from this question should be used in combination with the results of trends monitoring (Question #5) and compared to the causal factors

evaluated under Question #2. These comparisons will allow a more robust analysis of the effect of management actions.

3.4.1 Design and Location Criteria

Question #4 is best addressed through targeted sampling. Spatial effects should be evaluated upstream and downstream of the same set of management areas or BMPs monitored for Question #1, if suitable areas exist⁴. Monitoring sites should be channels with unarmored bed and banks that would be subject to potential effects of hydromodification. In general, the “analysis domain” should be consistent with and extend slightly downstream of the limits suggested by the Hydromodification Screening Tool (Bledsoe et al. 2010). In brief, the analysis domain proposed by Bledsoe et al. (2010) for downstream monitoring should occur to the first location that meets one of the following criteria:

- at least one reach downstream of the first grade-control point (but preferably the second downstream grade-control location)
- tidal backwater/lentic waterbody
- equal order tributary (Strahler 1952)
- a 2-fold increase in drainage area

Upstream monitoring should extend for a distance equal to 20 channel widths OR to grade control in good condition – whichever comes first. Within that reach, identify hard points that could check headward migration, evidence that head cutting is active or could propagate unchecked upstream. As with Question #3, different channel types are expected to respond differently. Therefore, ideally 3-5 sites representing high, medium, and low susceptibility (per Bledsoe et al. 2010) should be monitoring for each category of management action. Priority should be given to high and medium susceptibility sites, if resources pose a constraint. Sites should be conducive to long-term monitoring in terms of logistics and access.

3.4.2 Sampling Season, Frequency, and Duration

Sampling consists of the same physical and biological indicators measured for Question #3. Therefore, sampling should occur during the spring sampling season during the index period for benthic invertebrate and algal sampling protocols (typically April – June depending on weather conditions). Because sites used to answer this question are intended to be monitored over extended periods of time, sampling every other year is typically sufficient (subject to the triggers described below). Furthermore, as described below the downstream extent may need to change over time based on monitoring results. Many monitoring programs re-evaluate the general monitoring design at a regular interval, typically every five years, and make adjustments to accommodate evolving management needs.

⁴ It may also be desirable to select several legacy BMPs from other parts of the watershed to include in this element of the monitoring program.

3.4.3 *Specific Sampling Triggers*

Monitoring should be initiated based on the same triggers used for Question #3. First, construction or installation of a new representative BMP should initiate monitoring of that BMP (Question #1) and the immediate downstream area (Question #3). State and local agencies should coordinate to identify representative BMPs for monitoring. Second, monitoring intensity should be increased following major storm events or fires. Following these events, sites should be monitored more frequently for the first three years following the major event. The need for continuing high intensity monitoring beyond this time period should be evaluated based on the results from the first three years.

Spatial extent monitoring should also include an adaptive element. If effects are consistently observed downstream of BMPs or other management measures over several years, the monitoring location should be extended further downstream. This will allow incremental improvement in the ability to determine the actual extent of potential downstream effects. Note that this should include consideration of how past influences (e.g., headcutting from historical, pre-urban impacts) may interact with contemporary influences

3.5 **Question #5**

How do responses to hydromodification management vary over time?

Trend monitoring is particularly important for understanding hydromodification effects given that stream channel response is often stochastic/episodic and may occur suddenly following certain size storms or under specific combinations of circumstances. Conversely, gradual effects may persist for decades and stabilization and recovery following restoration and management may be manifested over long periods of time. Monitoring sentinel sites over long periods of time is the best way to understand these long-term effects and trajectories and to develop data sets with sufficient statistical power to detect change. Most of the monitoring should occur during the dry season and should include channel cross-sections the same physical and biological indicators used to evaluate effectiveness (Question #3, see Table 3). In addition, continuous flow monitoring through wet and dry seasons at key locations is necessary to understand effect of management measure over time. Trends monitoring is best accomplished through a long-term regional monitoring program. In some cases the same sites may be used to answer trends and effectiveness questions.

3.5.1 *Design and Location Criteria*

Trend monitoring should occur at two types of targeted sites. First, sentinel sites should be established at key watershed locations in consideration of past and current land use practices. These may also include locations downstream of important long-term management areas, such as regional retention basins or large floodplain restoration projects. They may also be at locations that integrate portions of the larger watershed (e.g. major tributary confluences). When choosing sites near confluences, care should be taken to not establish the monitoring site at the confluence, but just upstream of the confluence. This will reduce potential confounding factors associated with dynamism that often occurs

when two different size catchments join. Second, reference sites should be monitored to help document a baseline range of variability in response to normal decadal scale weather patterns. These natural adjustments will help bound the range of expected responses at sites subject to management measures. As with Questions #3 and #5, different channel types are expected to respond differently. Therefore, ideally 3-5 sites representing high, medium, and low susceptibility (per Bledsoe et al. 2010) should be represented in both the sentinel and reference sites. Priority should be given to high and medium susceptibility sites if funding poses a constraint. All trend sites should be amenable to long-term monitoring in terms of access and logistics.

3.5.2 *Sampling Season, Frequency, and Duration*

Trend monitoring should occur during both the wet and dry seasons. Dry season sampling consists of the same physical and biological indicators measured for Question #3. Therefore, sampling should occur during the spring sampling season during the index period for benthic invertebrate and algal sampling protocols (typically April – June depending on weather conditions)⁵. Wet season sampling consists of continuous flow monitoring and channel cross-section analysis. If continuous flow monitoring is not possible, event-based flow monitoring should occur during one of the three storm events monitored for Question #1, preferably an early season storm of moderate intensity. Discharge measurements should be initiated at the start of each monitored storm event and continue until flow has receded to at least 50% of peak flow. Continuous flow monitoring at 15-minute intervals is preferred, if possible. Channel cross-section and longitudinal profile should be surveyed immediately following the end of each monitored storm event. Ideally, sampling would occur at least every other year on an ongoing basis. Many monitoring programs re-evaluate the general monitoring design at a regular interval, typically every five years, and make adjustments to accommodate evolving management needs.

3.5.3 *Specific Sampling Triggers*

Trend monitoring should occur annually at the targeted reference and effects sites. If natural or anthropogenic factors cause a trend site to no longer be suitable for monitoring, it should be replaced with a comparable site. Monitoring intensity should be increased following major storm events or fires. Following these events, sites should be monitored more frequently for the first three years following the catastrophic event. The need for continuing high intensity monitoring beyond this time period should be evaluated based on the results from the first three years.

Ambient Condition Monitoring (Cooperative Statewide or Regional Monitoring)

3.6 Question #6

What is the physical and biological condition of streams relative to established regulatory or management objectives?

⁵ Many suitable sites for hydromodification monitoring will be dry for most of the year. These sites may be not be amenable to benthic macroinvertebrate or algae sampling.

This question provides an estimate of the regional extent and range of hydromodification effects through an ambient assessment of physical and biological conditions within the stream. This information provides context for interpreting the results of all other monitoring questions. Results from ambient condition monitoring document the range of expected conditions and provide insight into how those conditions vary across physical gradients such as slope, geologic setting, and watershed position. Monitoring should occur during the dry seasons and should include channel cross-sections and the same physical and biological indicators used to evaluate effectiveness and trends (Questions #3 to #5, see Table 3). Where possible, long-term continuous flow monitoring should also be used to help answer this question. Results from targeted monitoring from subsequent questions can be compared to the ranges produced by this question.

3.6.1 Design and Location Criteria

The characterization question is best answered through a probabilistic design. Probabilistic design allows for statistical inference of overall condition in the monitoring area based on sampling at a relatively small set of randomly selected locations. Sites can be stratified by watershed or other management unit of interest or can be sampled as a single stratum and then grouped later for comparative analysis. As a general rule, approximately 30 sites should be sampled per stratum to provide a statistically meaningful estimate of overall condition within the monitoring area. In southern California, the Stormwater Monitoring Coalition (SMC) has a regional monitoring program covering the region from Ventura through San Diego counties that has produced a set of randomly selected sites. The SMC sites could also serve as locations for assessing the regional extent of hydromodification effects.

3.6.2 Sampling Season, Frequency, and Duration

Ambient condition assessment should occur during the spring sampling season during the index period for benthic invertebrate and algal sampling protocols (typically April – June depending on weather conditions). Sampling should occur annually on an ongoing basis. Many monitoring programs re-evaluate the general monitoring design at a regular interval, typically every five years, and make adjustments to accommodate evolving management needs. The current SMC regional monitoring design involves sampling a different set of probabilistic sites each season. This design typically provides the most robust assessment of regional condition. However, revisiting a portion of previously sampled sites can provide information to support trends assessment (see Question #5).

3.6.3 Specific Sampling Triggers

Ambient monitoring typically involves sampling a specific number of sites each year irrespective of environmental conditions. However, intensified sampling may be desirable if substantial changes to the condition of a specific area are expected in association with a natural event (e.g. large flood or fire) or land use change (e.g. large new development area, major stormwater basin). Under these circumstances additional probabilistic sites can be selected from the regional sample draw and monitoring for a discrete period of time. This will help determine if there is a change in ambient condition in the specific area of interest.

3.7 Summary of Monitoring Locations

A hypothetical layout for all elements of this monitoring plan is shown in Figure 5 (note that the number of sites shown are for illustrative purposes only and not meant to imply an actual program). As stated above, this plan can be implemented modularly based on needs and not all elements would need to be implemented together (i.e. use as a toolbox of approaches). The first two elements (performance and effectiveness monitoring) will typically be implemented by permittees as part of their monitoring requirements. The second two elements (trends and characterization monitoring) are best done through long-term cooperative regional monitoring. However, all monitoring elements should be closely coordinated, particularly because individual sites may serve multiple roles (e.g. a site used for trends assessment may also be a reference site or an upstream BMP site). Also, a subset of sites initially used for permittee-directed monitoring may ultimately be incorporated into regional monitoring programs. Where possible, sites (or data) from other monitoring programs may be used to also support hydromodification monitoring.

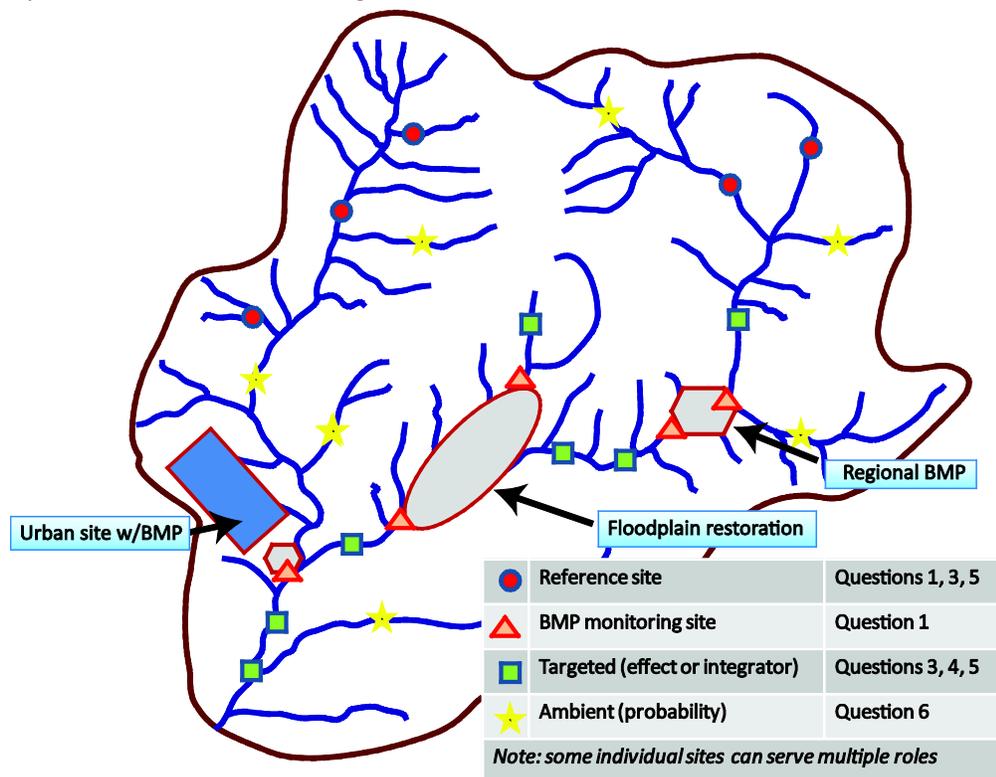


Figure 5. Hypothetical summary of how monitoring site might appear in a watershed. The number and locations of sites is for illustrative purposes only and are not meant to represent an actual program.

3.8 Preliminary Cost Estimates

Implementation of the recommended monitoring elements will require both up-front commitment of resources and recurring annual expenditures. Table 6 provides estimated unit costs per site for the major recommended field indicators.

Table 6. Unit costs for one-time up front and recurring annual monitoring of major indicators.

One time, up front costs		Recurring Annual Costs	
Flow		Flow	
pressure transducers	\$1,250	annual data download/processing	\$5,000
station set up	\$1,000		
Total	\$2,250	Biology and Geomorphology	
Biology and Geomorphology		Field geomorphic assessment	\$2,000
site recon & selection	\$2,000	field collection of inverts and algae	\$2,000
access and permits	\$1,000	CRAM	\$1,000
Total	\$3,000	benthic inverts taxonomy	\$600
		diatoms taxonomy	\$400
		data entry, QA/QC	\$500
		Total	\$6,500

We estimate the up-front per site cost to be \$5,250 and annual recurring per site cost to be \$11,500. Based on general recommendations in this chapter we also provide a range of estimates for annual monitoring costs for each type of monitoring site and each major indicator (Table 7). If all monitoring elements were implemented, the annual cost would range from \$456,000 - \$569,500 per watershed management area, depending on the number of sites sampled each year. However, \$195,000 of that cost would be for ambient condition assessment at probabilistic sites. The overall costs do not include monitoring infrastructure, such as data management, training, and reporting. As stated above, the intent is not for all elements to be implemented concurrently or by the same entity. Rather, we anticipate that various elements would be implemented over time by a combination of local and regional partners in order to defray costs and make implantation more practical. The costs provided in Table 7 should be considered preliminary estimates only.

Table 7. Preliminary cost estimates for each type of site and indicator representing the major monitoring elements.

Type of Site	Monitoring Questions	No. of sites	Flow		Biology and Geomorphology	
			up-front one-time	recurring annual cost	site recon: up-front, one time cost	recurring annual cost
BMP monitoring sites	1	6 - 9	\$13,500 - \$20,250	\$30,000 - \$45,000		
BMP reference sites (sites w/o BMPs)	1	3 - 5	\$6,750 - \$11,250	\$15,000 - \$25,000		
Instream effectiveness monitoring sites	3	6 - 9			\$18,000 - \$27,000	\$39,000 - \$58,500
Spatial effects sites	4	12 - 15			existing locations	\$78,000 - \$97,500
Trends sites	5	6 - 9	\$13,500 - \$20,250	\$30,000 - \$45,000	use existing effectiveness sites	
Reference sites	3, 4, 5, 6	6 - 9	\$13,500 - \$20,250	\$30,000 - \$45,000	\$18,000 - \$27,000	\$39,000 - \$58,500
Probalisitic sites	6	30			\$90,000	\$195,000

4.0 USE OF MONITORING RESULTS TO SUPPORT DECISIONS

Monitoring should not be a static endeavor. In addition to answering the core monitoring questions, information compiled through the monitoring programs should be used to inform management decisions and to guide evolution of the monitoring program itself. Results of the monitoring program should be added to the original watershed analysis and used to support issues such as:

- Identifying successful management measures that should be replicated in other areas and unsuccessful measures that should be modified or abandoned.
- Identifying areas of the watershed in need of additional management attention
- Conducting statistical power analysis to refine the location and frequency of monitoring and to improve protocols
- Providing data to refine, calibrate, and validate watershed models
- Improving understanding of the stress-response relationships between flow, physical habitat, and biological communities in order to support the evaluation of potential causes of degradation.

Full benefits of monitoring accrue based on a commitment to long-term implementation, which requires decision support systems and infrastructure to support the monitoring program. The resources necessary to support long-term ongoing monitoring will be beyond the means of individual municipalities or permittees. A long-term commitment to hydromodification monitoring can be best accomplished through a long-term regional grant program. Long-term implementation needs can be most effectively met through coordination with existing monitoring programs and by sharing existing monitoring infrastructure.

4.1 Triggers for Management Actions

Monitoring results should not only assess performance/compliance, but should inform adaptive management decisions. Hydromodification management is an immature field relative to other forms of water quality management. Consequently, there are relatively high levels of uncertainty associated with long-term effects of management actions.

Triggers for specific management actions will need to be developed for each watershed program consistent with the goals, objectives, and regulatory requirements of that program. These triggers can be informed by many factors, such as:

- Established regulatory limits (e.g. deviation from an objective, change in bioassessment score)
- Differences from reference conditions
- Deviations from pre-project conditions
- Deviations from a specified percentile of ambient conditions

Management actions may be informed by results of effectiveness or condition monitoring. Results of the effectiveness monitoring (Question #3) can trigger changes in the design of facilities or restoration areas (i.e. retrofits) or changes in operation (e.g. frequency of basin clean outs, elevation or size of discharge outlets). For example, a magnitude or duration of outflow from a basin of more than 15% greater than the designed specification could trigger specified management actions. Results from condition monitoring (Questions #4 and #5) can also trigger actions, such as additional causal assessment or implementation of contingency management measures (e.g. additional floodplain restoration). For example, an increase in channel cross sectional area of 15% greater than reference conditions could trigger the need for additional upstream restoration. Similarly, IBI scores consistently below a specific level could trigger the need to initiate a formal causal assessment. However, it is important to note that several watershed stressors may be contributing to the response observed during monitoring. The combined effects of hydromodification along with other stressors should be accounted for during the causal assessment.

Along with adaptation of management actions, monitoring results should also inform evolution of the monitoring program itself. Such “adaptive management” requires long-term commitment to the program; consequently, cooperation with ongoing regional monitoring programs become more critical. As the hypothesis underlying the monitoring program are supported or refuted, the design, location, frequency and/or choice of indicators should be adjusted. Results of early monitoring should inform refinements of subsequent years monitoring. For example, information on how far downstream hydromodification effects propagate (Question #4) can result in changes to the spatial extent of monitoring. Information on the rate of channel evolution (Question #5) can result in a change in the frequency of monitoring or adjustment of the triggers for intensified monitoring. Finally, increased knowledge on the sensitivity of specific indicators at detecting changes may result in some indicators being dropped and new indicators being added, or change in the overall intensity of monitoring.

4.2 Data Management, Information Dissemination, and Reporting

Realization of the goals of any monitoring program to inform management actions depends on an effect data management program. This is particularly important for watershed based monitoring program where information will need to be shared across jurisdictions. Monitoring programs should take advantage of regional data management systems, such as the California Environmental Data Exchange Network (CEDEN; <http://www.ceden.org>) and its associated Regional Data Centers. This requires up-front development of standard data formats that can be shared across programs. The Regional Data Centers provide secure web-based portals through which data can be accessed in a variety of ways. The goal is to provide an easy mechanism for retrieving monitoring results so that they can be used to inform management decisions.

Regular reporting should be directly related to the monitoring questions. Synthesis and analysis should be designed to clearly answer the questions and hypothesis in a way that informs decisions. If management triggers have been developed, data summaries should directly relate to whether triggers have been surpassed. Furthermore, monitoring results should be made readily available to decision

makers and the public as a means of education and to show the outcomes of the investment of resources toward addressing hydromodification.

4.3 Quality Assurance

Confidence in monitoring data requires standardized procedures for sample collection, processing, analysis, and data reporting. These procedures must be established up-front and clearly communicated through the various data and information management systems (see above). Quality assurance procedures are necessary for managers to have confidence in the quality of the data used to support their decisions. Data Quality Objectives (DQOs) are quantitative and qualitative statements that clarify study objectives, and specify the tolerable levels of potential errors in the data. DQOs are generally used to determine the level of error considered to be acceptable in the data produced by the monitoring program.

Ongoing training and field audits of monitoring sites should also be included as part of the quality assurance program. These actions will help ensure consistency and accuracy in data collection, which will be essential to the ability to synthesize data over time and space.

4.4 Final Considerations

This monitoring program includes aspects that are different than what is typically included in existing water quality monitoring. Monitoring methods, approach and program management will require developing new skills and capacities at the local and regional level. In addition, logistical challenges such as identifying sufficient, appropriate monitoring sites, securing site access, data management, and training of field staff will need to be addressed. We recommend that several pilot demonstration projects be conducted in order to provide an opportunity to refine the recommendations provided in this document and develop examples of program implementation. These early efforts will provide important lessons and templates that can be used to aid in long-term broad implementation. From the regulatory perspective, new frameworks may need to be developed to accommodate adaptive management and to encourage and facilitate integrated, watershed and regional scale solutions to hydromodification monitoring and assessment.

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APPENDIX A: BIBLIOGRAPHY OF SOURCE INFORMATION ON STREAMFLOW MEASUREMENT

Flow measurement is a key component of hydromodification monitoring. Long-term continuous flow monitoring provides much more robust data for general evaluation, assessment of management measure effectiveness and model calibration or validation. Although, less desirable, regular manual measurements of flow also provide important data for understanding behavior and response of stream channels.

There are many different approaches to measuring streamflow ranging from direct measures of velocity and cross-sectional area to relatively inexpensive approaches that measures stage (i.e. height of the water surface) and translate that to discharge using an established relationship based on channel geometry. The accuracy of the measurement is affected by the specific approach, the complexity of the technique and practitioner performance. The references below provide background information on various approaches, limitations and considerations for use, and description of protocols.

Rantz, S.E., et al. (1982). *Measurement and Computation of Streamflow: Volume 1. Measurement of Stage and Discharge*. United States Geological Survey Water-Supply Paper 2175. Washington D.C.

This report is a training and operations manual for USGS technicians that describes gaging station installation, and measurement of stage and discharge. It provides guidance on selecting a site for a gaging station, including considerations of channel geomorphology that come into play. Fundamentals of stage measurement are discussed and various methods used in recording and non-recording stream gaging stations are described. The report also discusses the fundamentals and theory of several methods of stream discharge measurement techniques, provides a practical description of the procedures and equipment used, and describes technical issues associated with each. There is also a discussion of the indirect determination of peak discharge.

Rantz, S.E., et al. (1982) *Measurement and Computation of Streamflow: Volume 2. Computation of Discharge*. United States Geological Survey Water-Supply Paper 2175. Washington D.C.

This report is a training and operations manual for USGS engineers to process field measurements into relationships of stage and discharge, to compute daily-discharge records, and to create a graphical representation of the stage and discharge relationship. It covers in detail the computation of stage-storage relationships for various gaging station equipment configurations and provides detailed procedural guidance for documenting, reporting, presenting and publishing gaging station records and computed stage-discharge relationships.

Various downstream natural hydraulic controls and various man-made controls of known geometry are discussed with respect to their effects on stage and discharge relationships. The report covers in depth the topic of determining, analyzing, and correcting for various causes of shift in the stage-storage relationship due to changes in various man-made and natural stream controls, and due to ice effects. It also discusses some typical causes of shift seen in the stage-discharge relationship in sand-channel streams relative to fixed channels, and methods for troubleshooting and properly charting and adjusting

the rating curve. Methods for extrapolation of stage-discharge relationships beyond measured data both on the low and high ends of the flow spectrum are reviewed.

The report contains a discussion of the theory and provides several methods for determining discharge ratings for tidal streams and other instances of variable backwater, or discharge--such as at hydraulic facilities--which may require extra parameters such as slope and velocity index. Additionally, it presents examples for establishing the relationships, with further discussion of the theory and methods for adjusting unsteady flow rating curves to represent steady flow conditions.

Freeman, Lawrence A. et al. (2004). *Use of Submersible Pressure Transducers in Water-Resources Investigations*. United States Geological Survey Techniques of Water-Resources Investigations 08-A3: Reston, VA.

Pressure transducers are commonly used to measure water surface elevation in stream gaging. This report presents the theory behind data collection using pressure transducers, particularly in well-type installations. The report describes the fundamentals of data collection protocol, and provides guidance on various field methods for installation, data processing (refining and calibrating), and quality assurance of collected data. There is a discussion of the physics and electronic circuitry behind pressure transducer operation, as well as the errors inherent in the system. Examples of application in various environments are discussed, along with typical related operational difficulties and potential solutions.

Mueller, David S. and Wagner, Chad R. (2009). *Measuring Discharge with Acoustic Doppler Current Profilers from a Moving Boat*. United States Geological Survey Techniques and Methods 03-A22. Reston, VA.

This report explains in detail the procedures for measuring discharge using an Acoustic Doppler Current Profiler (ADCP). It provides procedures for equipment preparation, field methods and equipment configurations for data collection, and data management and processing, including quality control. The report discusses the theory behind ADCP measurement technology, including potential limitations. It relates this discussion to practical use, providing procedures for equipment calibrations and maintenance adjustments to address various performance issues.

ATTACHMENT 63

MODELING AND MANAGING HYDROMODIFICATION EFFECTS: SUMMARY OF AVAILABLE TOOLS AND DECISION-MAKING APPROACH

Technical Report 753
March 2013



Eric D. Stein
Brian P. Bledsoe



Southern California Coastal Water Research Project

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EXECUTIVE SUMMARY

Hydromodification management has traditionally focused on addressing excessive erosion or deposition in channels and the resulting geomorphic changes. The evolution of stormwater management beyond a focus on water chemistry is an important step forward in holistic efforts to protect the physical, chemical, and biological integrity of water courses. However, current approaches to hydromodification have been limited to managing runoff at the site of new or re-development. Although this approach is beneficial, there is a need for hydromodification management to evolve to a watershed-based approach focused on restoration and protection of watershed processes. Accomplishing this requires developing and organizing new tools and approaches that support integrative assessment and management. This document summarizes suites of modeling tools that can be used to help characterize and predict the complex and multifaceted effects of hydromodification. We also present an approach for developing management prescriptions that account for the specific needs and constraints of individual stream reaches in the context of the watershed in which they exist.

Modeling tools can be organized into four basic categories in increasing level of complexity: descriptive tools, statistical models, mechanistic models with deterministic outputs, and probabilistic models. Descriptive tools are the easiest to apply, but typically provide only general or coarse resolution output. Statistical and mechanistic models are more precise, yet require more data input for their use. Finally, probabilistic models are relatively new for stream analysis, but have the advantage of providing an explicit account of model uncertainty. In most cases, multiple modeling tools will be necessary to fully assess potential hydromodification effects; however, the precise combination of tools applied will vary based on needs, quality of streams being managed, and available resources.

We have developed several new tools, which are also described in this document. These include:

- Revised regional hydrologic curves for estimating discharge in ungauged basins.
- Analytical regime diagrams that allow prediction of changes in channel dimensions based on changes in water or sediment discharge.
- A regional update to the channel evolution model that illustrates expected trajectories of channel response to hydromodification.
- Several statistical channel enlargement models based on regression using local data.
- An artificial neural network model for predicting change in channel cross-sectional area based on a suite of watershed variables.
- An updated version of the GeoTools spreadsheet package for assessing geomorphic response.

These tools, in combination with existing tools, have the potential to advance hydromodification management by:

- Providing a physical basis for making predictions of stream response to watershed development.
- Assessing alternative future states of streams under different management scenarios.
- Avoiding one-size-fits-all solutions through:
 - Improved prediction of relative magnitude of potential channel change and proximity to response thresholds; and

- Tailoring mitigation strategies to streams with different levels of susceptibility.

Statistical models developed in this study indicate that the magnitude of channel enlargement and overall risk of channel instability are highly dependent on the ratio of post-to pre-urban sediment-transport capacity over cumulative duration simulations of 25 years. This ratio is often termed the *erosion potential (Ep)* or *load ratio (Lr)* and is a better predictor of long-term channel response than stream discharge. In addition, hydraulic variables (such as *Ep*, shear stress, or stream power) provide a “common currency” for managing erosion and associated effects that can be applied across many streams in a region. *Overall, the enlargement models point to the importance of balancing the post-development sediment transport to the pre-development setting over an entire range of flows rather than a single flow in order to reduce the risk of adverse channel responses to hydromodification.*

As with modeling, management strategies should also address the complexity of processes that affect stream response to hydromodification through application of a broad suite of management strategies beyond traditional site-based flow control. The foundation of any hydromodification management approach should be a watershed-scale analysis of existing and proposed future land uses and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.

Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions including constraints that may limit the ability to apply certain approaches (e.g., existing development and channelization). A one-size-fits-all approach should be avoided.

An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed. To address existing, legacy and anticipated future effects, management approaches will need to focus on controlling erosion, deposition, and planform change as well as restoring watershed processes that ensure movement of water and sediment in ways that help maintain the dynamic equilibrium of stream channels. Such process-based management actions include:

- Protecting and restoring coarse sediment-supply areas.
- Maintaining and sediment transport capacity through critical stream reaches.
- Protecting and restoring floodplain connections and infiltration areas adjacent to channels.

Modeling and management programs should be connected to robust monitoring that can provide data to calibrate, test, and refine models and improve management approaches and the empirical basis upon which they are constructed.

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1.0 INTRODUCTION AND PURPOSE OF THE DOCUMENT

Hydromodification management is aimed at addressing issues of excessive erosion or deposition in channels and the associated geomorphic changes. The evolution of stormwater management beyond solely focusing on water chemistry is an important step forward in holistic efforts to protect the physical, chemical, and biological integrity of water courses. However, current approaches to hydromodification have been limited to managing only runoff, only at the site of new or re-developments, and without a watershed context. This approach has been shown to be insufficient to fully address hydromodification impacts in other regions (Booth and Jackson, 1997; Maxted and Shaver, 1999). Moreover, the focus on new and redevelopment does not include mechanisms to address legacy effects that may be affecting channel conditions. Present understanding of the causes and effects of urbanization suggest that site-based runoff control must be expanded to include integrated flow and sediment management at the watershed scale, along with targeted stream corridor/floodplain restoration (National Research Council (NRC), 2009; Stein *et al.*, 2012).

Hydromodification management approaches should be selected and designed to protect and restore agreed upon or designated beneficial uses and overall receiving water conditions, *by maintaining or reestablishing the watershed processes that support those conditions*. “Restoration” does not imply the return to a pre-development condition; instead, it may be defined as assisting the establishment of improved hydrologic, geomorphic, and ecological processes in a degraded watershed system (Wohl *et al.*, 2005). Achieving this goal will require that hydromodification management strategies be broadly considered beyond the location of individual projects and operate across programs beyond those typically regulated by National Pollutant Discharge Elimination System (NPDES)/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land use planning, non-point source runoff control, Section 401 Water Quality Certifications and Waste Discharge Requirement programs, in addition to traditional stormwater management programs.

A technical workgroup commissioned by the State Water Resources Board produced a broad set of recommendations for watershed-scale hydromodification management as part of their Technical Report #667 *Hydromodification Assessment and Management in California* (Stein *et al.*, 2012). The proposed management framework included on-site actions, floodplain management, and in-stream restoration. The goal of this document is expand on the recommendations from Stein *et al.* (2012) and provide a more detailed roadmap for 1) evaluating the efficacy of existing modeling tools in support of hydromodification management, and 2) selecting a suite of management measures at the appropriate scale and intensity. As such, the report is divided into two sections. Section 2 provides an overview of available modeling tools (including novel models developed in this project), and Section 3 provides a broad perspective on decision-making approaches for selecting hydromodification management measures. Both sections are intended to provide a set of potential tools and approaches that can be applied based on individual needs, stream conditions, and priorities. The approaches are not intended to be prescriptively used in all instances.

2.0 SUMMARY OF AVAILABLE TOOLS

Watershed urbanization alters natural hydrologic storage processes and leads to increased runoff volumes and rates with consequent increases in erosion and sedimentation potential if left unmitigated. In many southern California watersheds, altered flows of water and sediment resulting from urbanization and other land use changes (i.e., hydromodification) have resulted in channel incision, widening, and other forms of stream instability, as well as loss of riparian functions and connectivity. Even where interactions between climate and land use changes do not result in significant increases in upslope erosion, altered runoff processes may accelerate channel erosion and negatively affect water quality both upstream and downstream of a localized disturbance. The adverse impacts of hydromodification include threats to property and infrastructure, reduced habitat for aquatic life, increased water treatment costs, and diminished reservoir capacity.

Hydromodification results in variable hydrologic, geomorphic, and ecologic responses depending on site-specific factors like the connectivity of impervious areas and stormwater drainage systems, watershed soil characteristics, and the inherent resistance of stream channels to increased erosive forces. Characterizing, predicting, and managing the complex and multifaceted effects of hydromodification is therefore challenging, and there is no single model or predictive assessment tool that can answer the basic questions that are increasingly confronted by managers. These questions include:

- To what extent are patterns of stream flow altered by urban development?
- How do streamflow alterations relate to channel erosion, enlargement, and instability?
- In what ways and how much are the channel and its physical structure likely to respond after development – a little or a lot?
- Do different kinds of streams require different kinds of best management practices (BMPs) to protect channel structure and processes?
- What are reasonable expectations for effects of individual or combinations of BMPs, i.e., how can the location and type of BMP(s) relate to changes in channel structure, stability or recovery?
- What are reasonable expectations for achieving restoration based on specific conditions in a watershed?

Despite the plethora of existing tools and models that are relevant to hydromodification analysis and management (e.g., US Environmental Protection Agency (USEPA, 2007)), most predictive assessments of hydromodification impacts and analyses supporting site design decisions and mitigation activities currently rely on a few relatively-simplistic tools and models. For example, new developments may be required to match pre-development peak discharges for certain design storms or across some portion of a flow-duration curve regardless of the type of receiving stream (e.g., a sand bed vs. a boulder bed). Although uncomplicated and widely transferable approaches for minimizing the impacts of hydromodification are highly desirable from a practical standpoint, they may not sufficiently control the post-development discharges across the full spectrum of erosive flows as defined by the boundary conditions and inherent susceptibility of the receiving streams (both on-site and nearby). Therefore, there is a need for identifying modeling and assessment approaches that better balance the need for simplicity with the need for adequately representing the stream system being managed.

There are currently a number of gaps in the typical modeling toolbox that is utilized in hydromodification management. These gaps include:

- Hydrologic prediction at ungauged sites;
- Channel evolution models that conceptualize the predominant geomorphic processes and thresholds in disturbed channels of a particular region;
- More detailed and physically-rigorous channel response tools that build on rapid field assessments;
- Spreadsheet tools that facilitate computation of geomorphic metrics such as erosion potential and effective discharge;
- Models to estimate reduction in sediment supply (and sediment type) from developed land surfaces;
- Probabilistic models of stream response that explicitly quantify uncertainty; and
- An assessment of whether mobile boundary hydraulic models are appropriate for predicting stream response in this region.

Finally, there is a parallel need for practical guidance that enables managers to better evaluate models and their appropriate uses. When reviewing modeling-based hydromodification studies prepared by consultants, managers are often confronted with questions such as:

- Is this model appropriate for the question(s) at hand?
- What are the key considerations associated with a particular tool (e.g., scale, vintage of data, parameterization, etc.)?
- What are the underlying assumptions about physical and hydrological processes that are used by the model?
- What information and data are sufficient to drive the model?
- What is the simplest model that will provide adequate prediction accuracy?
- What is level of certainty associated with the output?

This section of the report begins to address the broad question of “how do we begin to organize models in a way that is useful to managers for decision-making?” There are two target audiences: 1) those who will actually be doing hydromodification modeling and 2) those who must review their work. The specific aims of this section are to:

- Present a general framework for understanding the role of models in hydromodification management.
- Provide a concise evaluation of selected modeling tools that are most relevant to hydromodification management in southern California (while highlighting some of the modeling tools developed in this project) in terms of the types of management questions the tools can address, input data requirements, scale of application, etc.
- Put individual models into the broader context of some complementary sets or suites of tools that are important in hydromodification management.
- Discuss ongoing limitations, key uncertainties, and priorities for future model development.

This section of the report complements Southern California Coastal Water Research Project (SCCWRP) Technical Report #667 *Hydromodification Assessment and Management in California* (Stein *et al.*, 2012) by 1) providing more specific information on novel modeling tools that address some of the gaps in current modeling tool box, and 2) delving more into some practical considerations of how models can inform hydromodification management. The new modeling tools developed in this study are described and put into the context of existing tools in terms of the management questions they can inform, and practical considerations in application and interpretation.

2.1 A General Framework for Understanding Models in Hydromodification Management

In the context of hydromodification, tools and models are typically used to help answer one or more of the following questions involving an assessment of natural and human influences at various spatial and temporal scales:

- What is the present stability status of the stream system and what are the dominant processes and features within the system?
- How have past human influences affected the current state and future potential of the stream?
- What is the likely future trajectory of the stream in the absence of any changes in land use or mitigation measures (e.g., no action alternative)?
- How will the stream likely respond to alterations in runoff and sediment supply?
- What level of flow control or other mitigation measures are necessary to protect the receiving stream(s)?

Many studies have underscored the variability and complexity of relationships between watershed land use, hydrologic processes, and the physical and ecological conditions of stream systems. Clearly, the process of assessing stream condition and predicting future conditions is very challenging and subject to uncertainty. Therefore, it is important to understand the strengths and limitations of available tools, especially with respect to prediction uncertainty, so one can choose an appropriate model for the question at hand. In addition to prediction uncertainty, considerations in choosing a model for a particular application include appropriate spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding (National Research Council (NRC), 2001; Reckhow, 1999a,b).

Figure 1 presents an organizing framework developed as part of this study for understanding general types of available tools that may be applied in support of hydromodification management and policy development. Tools fall into three major categories: 1) descriptive tools, 2) mechanistic and empirical/statistical models that are used deterministically, and 3) probabilistic models/predictive assessments with explicitly quantified uncertainty. The organizing framework relates these categories to the types of questions the tools are designed to answer, specifically: characterization of stream condition, prediction of response, establishment of criteria/requirements, or evaluation of management actions. The framework also characterizes the tools according to the following features: intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. Subsequent portions of this section discuss each of the three major categories in turn, highlighting

examples of specific tools within each category with particular emphasis on new tools developed in this project.

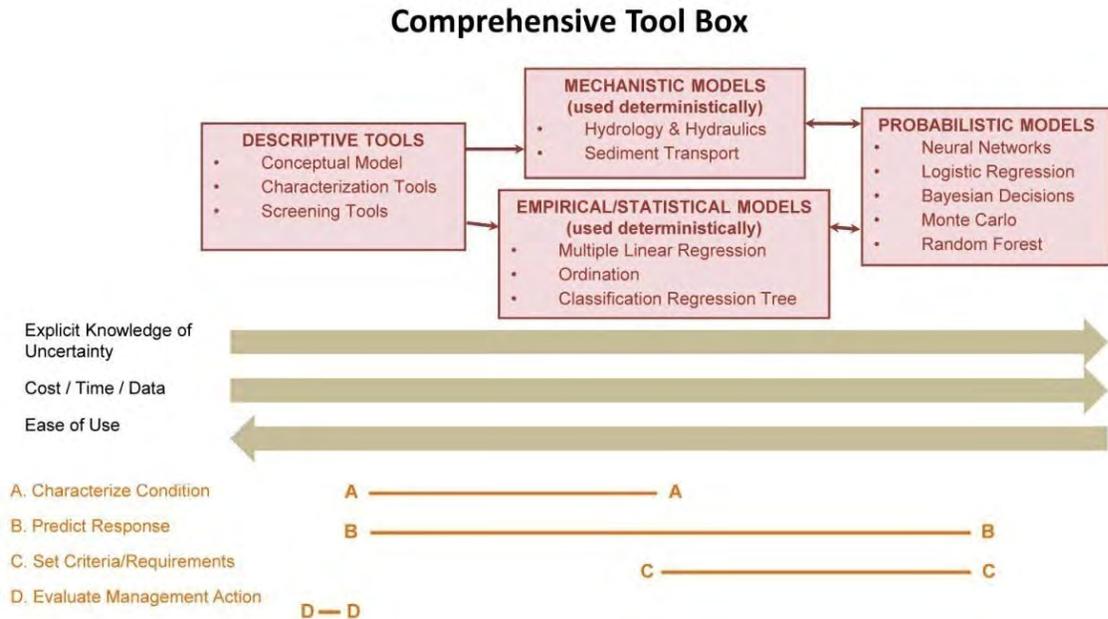


Figure 1. Organizing framework for understanding hydromodification assessment and management tools.

Tool selection should mirror the level of resolution that is required based on the point in the planning process. In the early stages of conducting an assessment, descriptive tools will be sufficient, but more precise tools will be required toward the design phase. Currently, most projects rely solely on deterministic models. However, given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

"Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high."

2.1.1 Descriptive Tools

Descriptive tools include conceptual models, screening tools, and characterization tools. These tools are used to answer the question: *What is the existing condition of a stream or watershed?* Although descriptive tools are not explicitly predictive, they can be used to assess levels of susceptibility to future stressors by correlation with relationships seen elsewhere. The application of some type of descriptive tool, such as a characterization tool, is usually necessary before applying a deterministic model because descriptive tools aid in understanding the key processes and boundary conditions that may need to be represented in a more detailed model.

Conceptual models

A conceptual model, in the context of river systems, is a written description or a simplified visual representation of the system being examined, such as the relationship between physical or ecological entities, or processes, and the stressors to which they may be exposed. Conceptual models have been used to describe processes in a wide range of physical and ecological fields of study, including stream-channel geomorphology (Bledsoe *et al.*, 2008). For example, Channel Evolution Models (CEMs) are conceptual models which describe a series of morphological stages of a channel, either as a longitudinal progression from the upper to the lower watershed, or as a series at a fixed location over time subsequent to a disturbance. The incised channel CEM developed by Schumm *et al.* (1984) is one of the most widely-known conceptual models within fluvial geomorphology. This CEM documents a sequence of five stages of adjustment and ultimate return to quasi-equilibrium that has been observed and validated in many regions and stream types (American Society of Civil Engineers (ASCE), 1998; Simon and Rinaldi, 2000). Conceptual models in fluvial geomorphology also include planform classifications of braided, meandering and straight, and many other typologies that categorize streams by metrics such as slope, sinuosity, width-to-depth ratio, and bed-material size. The famous qualitative response model described by Lane's diagram (1955) is also a conceptual model.

A novel CEM for southern California

A new CEM with quantitative extensions was developed in this project to provide managers with a framework for understanding channel responses and rehabilitation alternatives in the region. The Schumm *et al.* (1984) CEM was modified for streams characteristic of southern California, including transitions from single-thread to multi-thread and braided evolutionary endpoints (Hawley *et al.*, 2012). The CEM is based on southern California data from 83 detailed channel surveys, hundreds of synoptic surveys, and historical analyses of aerial photographs along 14 reaches. The field surveys indicate that channel evolution sometimes follows the well-known sequence described by Schumm *et al.* (1984) for incising, single-thread channels; however, departures from this sequence are common and include transitions of single-thread to braided evolutionary endpoints, as opposed to a return to quasi-equilibrium single-thread planform. Thresholds and risk factors associated with observed channel response were also identified. In particular, distance to grade control and network position emerged as key controls on channel response trajectory.

Channels in southern California were observed to respond in ways that were at the same time analogous to and departed from the CEM of Schumm *et al.* (1984) (Figures 2 and 3). The fundamental importance of grade control in promoting the eventual return to quasi-equilibrium stages such as CEM Type IV or Type V is underscored in Figure 3, as incision-driven responses almost exclusively revolved around a hardpoint fulcrum. Self-stabilized reaches without a proximate grade control structure were rare, both during field reconnaissance and in our dataset (2 of 33 reaches, 3 of 83 sites). A similar trajectory was observed in a subset of braided systems which in some cases follow a sequence analogous to the Schumm *et al.* (1984) CEM for incising single-thread channels. This was especially true for the initial stages of incision (Phase B2), widening (Phase B3), and aggrading (Phase B4); which were primarily triggered by a base-level drop and the resulting headcutting. This was also caused by artificial increases in and/or concentration of flow from new stormwater outfalls or at road crossings via culverts

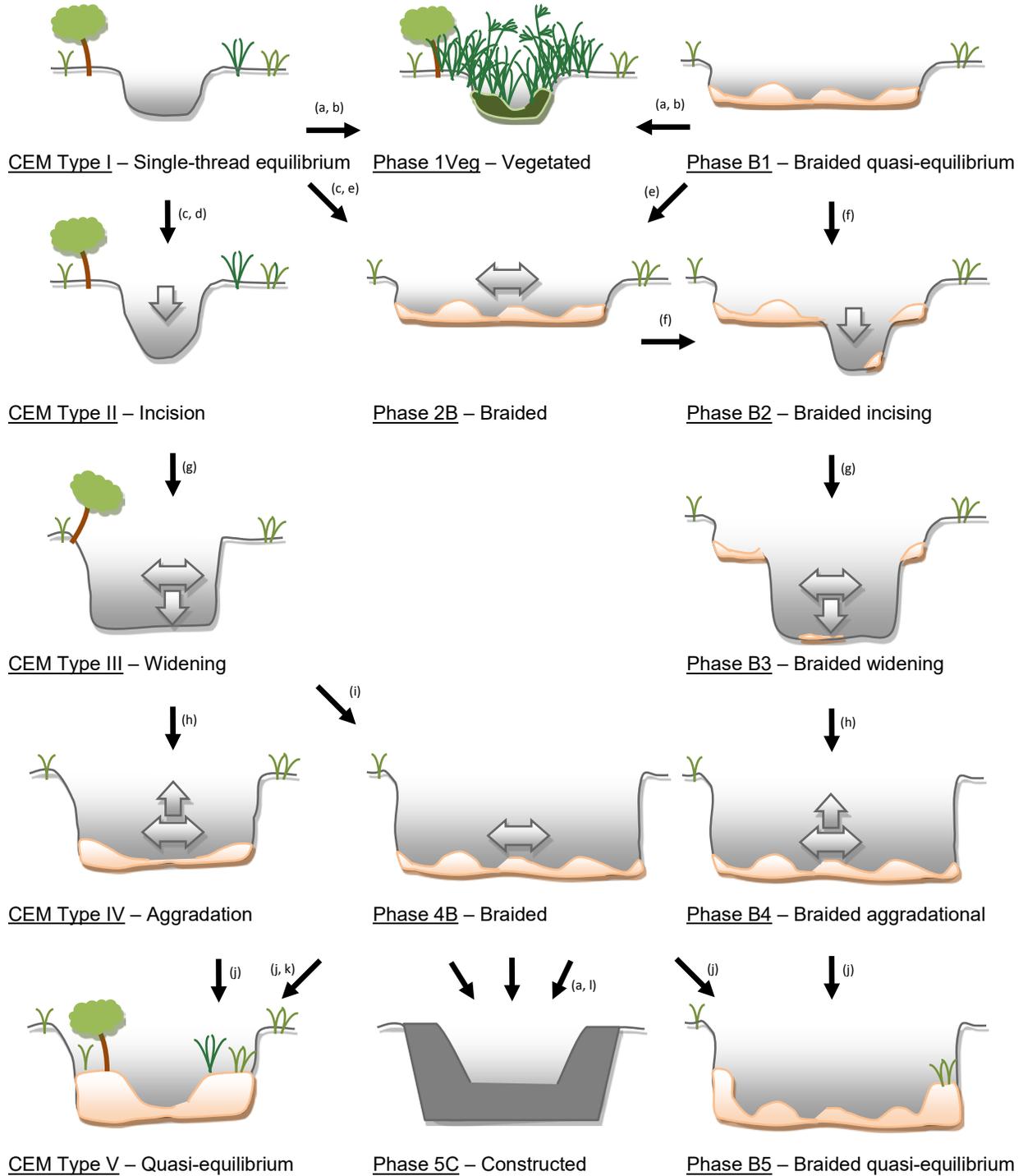
that concentrate the hydraulic energy but reduce sediment through flow, consistent with Chin and Gregory's (2001) observations in urbanizing ephemeral streams of Arizona. Indeed, this response sequence was routinely observed in predominantly rural watersheds (i.e., <1% imperviousness) where it seemed almost exclusively attributable to sediment discontinuities induced by channel fragmentation from infrequent human infrastructure, consistent with the widely-documented response of channel incision downstream of dams.

Although braided channels are widely considered less stable than single-thread channels (Ferguson, 1993; Hoey and Sutherland, 1991; Nanson and Croke, 1992; Schumm, 1977, 1981, 1985) with many classic examples of frequent and large shifts in channel position (Chien, 1961; Gole and Chitale, 1996), audits of historical aerial photography at several sites suggest that braided systems can also attain quasi-equilibrium for ca. 50 years in this region. This is consistent with recognition by other researchers that braiding can be an equilibrium channel state, given the necessary boundary conditions that result in no net change in the vertical or lateral dimensions over time (Chang, 1979; Klaassen and Vermeer, 1988; Leopold and Wolman, 1957; Parker, 1976; You, 1987).

CEM for Incised Single-Thread Channels
(adapted from Schumm *et al.* (1984))

Southern California
Bifurcations from
Conventional
Five-stage CEMs

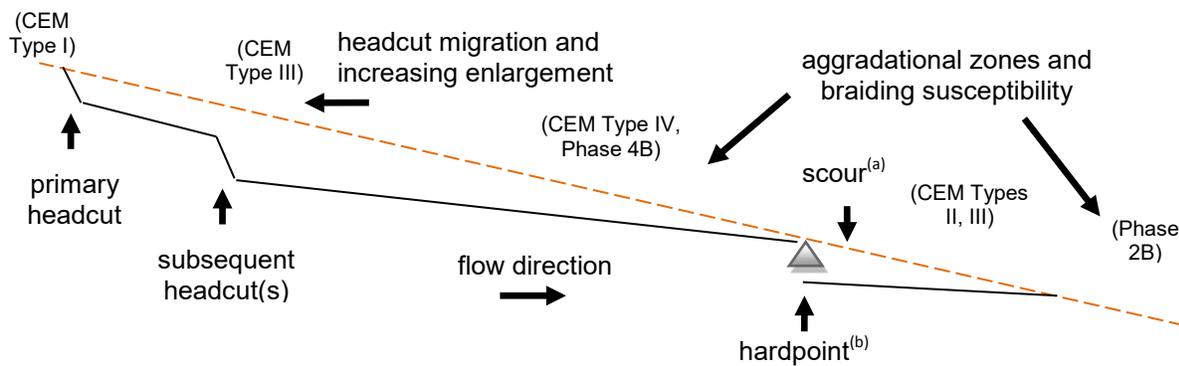
CEM for Braided Channels



(Continued Next Page)

- (a) Can be preceded by any CEM stage
- (b) Induced by urban base flow such as lawn irrigation or wastewater treatment plant (WWTP) effluent
- (c) Relative erodibility of bed and bank material, available valley width, and downstream distance to hardpoint are key boundary conditions
- (d) Possible drivers include: S^+ , Q^+ , and/or Q_s^- basin
- (e) Possible drivers include: Q_s^+ basin, and/or Q^+ with Q_s^+ channel
- (f) Possible drivers include: S^+ , Q^+ , Q_s^- basin, and/or Q_s^- channel
- (g) Incision depth exceeds critical bank height for given angle (i.e., failure via mass wasting)
- (h) Q_s^+ channel exceeds transport capacity leading to toe protection of banks via aggradation
- (i) Q_s^{++} channel leads to excessive/irregular aggradation, flow deflection, and continued bank failure (bank strength and general cohesiveness of floodplain are key boundary conditions)
- (j) In most unstable southern California systems, a proximate downstream hardpoint (natural or artificial) is critical as a fulcrum for complex response sequences and the eventual return to quasi-equilibrium
- (k) Conceivable from any prior braided state; however, increasing braiding extent (i.e., degree of departure from reference channel width) would seem to decrease the probability of a return to single-thread quasi-equilibrium
- (l) Predominant terminal condition in urban/suburban channels of southern California

Figure 2. CEM of semiarid stream response to urban-induced hydromodification.



Notes:

- CEM stages in parentheses
- (a) the discontinuous effects of urban infrastructure such as scour downstream of grade control and increasing width-to-depth ratio moving downstream has also been observed in ephemeral Arizona streams in response to urbanization (Chin and Gregory, 2001)
- (b) natural (e.g., bedrock) or artificial (e.g., riprap/concrete) grade control

Figure 3. Profile view of one common evolution sequence in southern California channels in response to hydromodification.

A preliminary quantification of the CEM was performed using hydraulic and geomorphic metrics from all 83 study sites. Plotting the specific stream power (ω) of the 10-year flow vs. median grain size of bed material (d_{50}) by aggregated CEM stage (Figure 4) shows separation between states of dynamic equilibrium and disequilibrium. Single-thread channels in unconfined valleys that are in or approaching states of dynamic equilibrium (CEM Type I, Phase 1Veg, and CEM Types IV and V) tend to have the lowest specific stream power for a given bed-material resistance. Braided channels in states of dynamic equilibrium (Phase B1) typically have slightly higher erosive energy than single-thread equilibrium; however, they tend to have lower erosive energy than disequilibrium states (CEM Types II and III and Phases B2, 2B, and 4B).

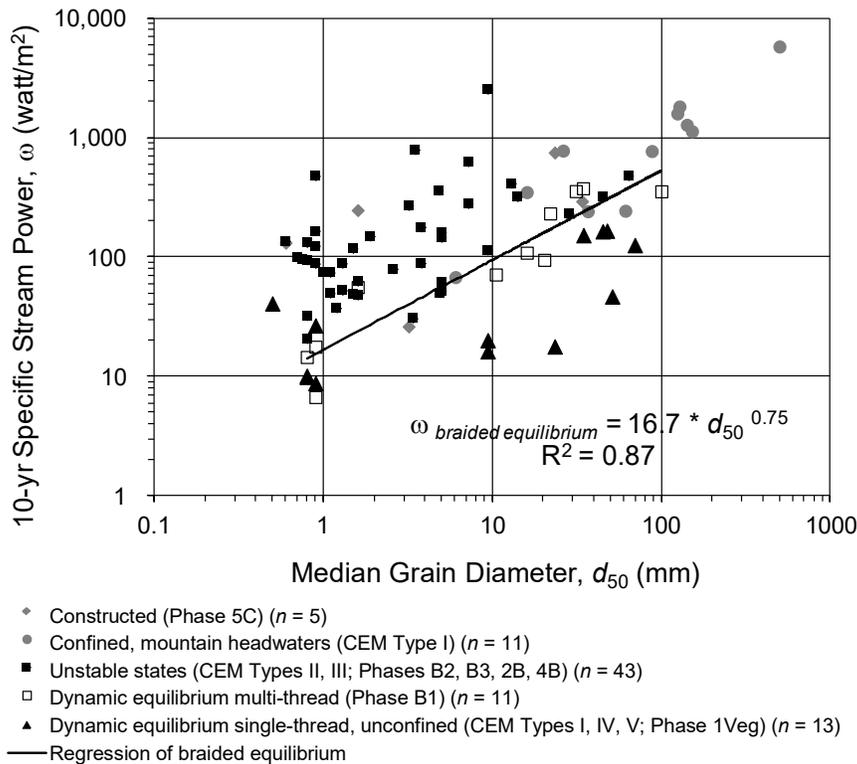


Figure 4. Ten-year specific stream power vs. median grain diameter by CEM stage of all 83 sites with superimposed power function of Phase B1 channels for visual separation.

Plotting the top width for a 10-year water-surface elevation vs. the 10-year peak flow for single-thread equilibrium systems in unconfined valleys and unconstructed settings resulted in a well-fit power function as a regional representation of forms sufficiently wide to dissipate energy without resulting in multiple flow paths (Figure 5). For reference, braided channels and incising channels (CEM Types II and III) are included in Figure 5, and indicated nearly-perfect separation over the power function. The relationship was then used to estimate a reference width (W_{ref}) for each site as a function of the 10-year peak discharge that is used to define a valley width index that was incorporated into the channel susceptibility screening tool that was developed in this project (Bledsoe *et al.*, 2012).

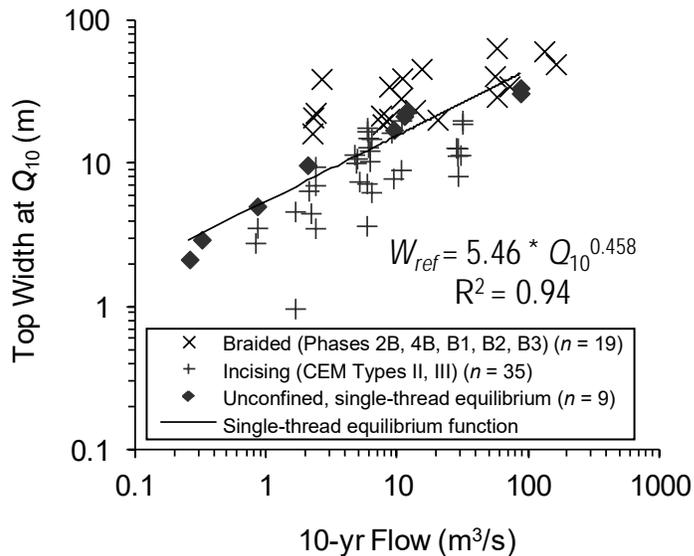


Figure 5. Top width vs. 10-year flow at unconfined, unconstructed single-thread equilibrium, braided, and incising sites with superimposed power function fitted to single-thread equilibrium sites.

The southern California CEM is a conceptual model that has utility for guiding management strategies as detailed in Hawley *et al.* (2012). For example, arresting channel instabilities in systems that are beginning to braid but have a width near W_{ref} , may have a higher likelihood of promoting a return to single-thread equilibrium than those systems with substantially greater widths. In this case, management of a new channel state may be more feasible than attempting to “restore” the channel to a prior state. With respect to incision, the CEM underscores the importance of employing rehabilitation measures before reaching critical bank height (prior to CEM Type III of the Schumm *et al.* (1984) model) in terms of cost and the disproportionate increase in channel erosion and downstream sedimentation/habitat degradation. In another example of using the CEM to guide rehabilitation, the distance away from the equilibrium lines in Figures 4 or I.5 could be used to help establish a threshold between channel restoration and “reconstruction to a new form” because it reflects likelihood of success. That is, CEM Type I could be targeted for preservation, restoration activities would be focused on Type II and early Type III channels, with the latter stages managed as a new form.

Regional CEMs can partially address the needs of the hydromodification management community by providing a framework for interpreting past and present response trajectories, identifying the relative severity of potential response sequences, applying appropriate models in estimating future channel changes, and developing strategies for mitigating the impacts of processes likely to dominate channel response in the future (Simon, 1995). CEMs can be useful in assessing channel instability both independently and as a part of a broader field-screening / reconnaissance tool. More details on specific channel trajectories and other aspects of the southern California CEM are provided in Hawley *et al.* (2012).

Characterization tools

Examples of characterization tools include baseline geomorphic assessments, river habitat surveys, and fluvial audits. A fluvial audit (Sear *et al.*, 1995, 2009) uses contemporary field surveys, historical map and documentary information, and scientific literature resources to gain a comprehensive understanding of a river system in its watershed context and how it arrived at its present state. Fluvial audits, along with watershed baseline surveys are a standardized basis for monitoring change in fluvial systems. These types of comprehensive assessments are comprised of numerous, more detailed field methodologies, such as morphologic surveys, discharge measurements, and estimates of boundary material critical shear strength through measurements of resistance (for cohesive sediments) or size. Baseline assessments may also draw on empirical relationships such as sediment-supply estimation models to explain stream responses to past watershed disturbances.

Screening tools

Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes that may occur due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings. The practical need for rapid assessments in stream management have prompted many efforts to develop qualitative or semi-quantitative methods for understanding the potential response trajectories of channels based on their current state.

Most screening-level tools for assessing channel instability and response potential, especially in the context of managing bridge crossings and other infrastructure, have borrowed elements of the CEM approach and combined various descriptors of channel boundary conditions and resisting vs. erosive forces. For example, Simon and Downs (1995) and Johnson *et al.* (1999) developed rapid assessment techniques for alluvial channels based on diverse combinations of metrics describing bed material, CEM stage, existing bank erosion, vegetative resistance, and other controls on channel response. Although based on a strong conceptual foundation of the underlying mechanisms controlling channel form, these tools were developed with goals and intended applications (e.g., evaluating potential impacts to existing infrastructure such as bridges or culverts) that differ somewhat from what is needed by current hydromodification management programs.

This project has resulted in a general framework for developing screening-level models that help assess channel susceptibility to hydromodification, and a new region-specific tool for rapid, field-based assessments in urbanizing watersheds of southern California (Bledsoe *et al.*, 2010, 2012). The criteria used to assign susceptibility ratings are designed to be repeatable, transparent, and transferable to a wide variety of geomorphic contexts and stream types. The assessment tool is structured as a decision tree with a transparent, process-based flow of logic that yields four categorical susceptibility ratings through a combination of relatively simple but quantitative input parameters derived from both field and geographic information system (GIS) data. The screening rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The screening tool incorporates various measures of stream bed and bank erodibility, probabilistic thresholds of channel instability and bank failure based on regional field data,

integration of rapid field assessments with desktop analyses, and separate ratings for channel susceptibility in vertical and lateral dimensions.

This project has also produced a screening-level model that predicts changes in post-development sediment delivery based on watershed analyses of “Geomorphic Landscape Units” (GLUs) in a GIS (Booth *et al.*, 2010). A GLU analysis integrates readily-available data on geology, hillslope, and land cover to generate categories of relative sediment production under a watershed’s current configuration of land use. Those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting developed land cover for the original categories and reassessing the relative sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect sediment yield to receiving channels.

2.1.2 Mechanistic and Empirical/Statistical Models with Deterministic Outputs

Mechanistic/deterministic models are simplified mathematical representations of a system based on physical laws and relationships. Empirical/statistical models describe the extent to which variation in output can be explained by (associated with) input variables. Both types of models are typically used to generate a single output or answer for a given set of inputs (despite the fact that statistical models are usually quite amenable to producing distributions of outputs). These tools can be used to help answer such questions as: *What are the expected responses in the stream and watershed given some future conditions? What criteria should be set to prevent future hydromodification impacts?* However, hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and the stream response. Deterministic representations of processes and responses can, therefore, mask uncertainties and be misleadingly precise, unless prediction uncertainty is explicitly characterized.

Hydrologic models

These models are used to simulate watershed hydrologic processes, including runoff and infiltration, using precipitation and other climate variables as inputs. Some models, such as the commonly-used Hydrologic Engineering Centers (HEC) – Hydrologic Modeling System (HMS), can be run for either single-event simulations or in a continuous-simulation mode which tracks soil moisture over months or years. Single-event simulations are focused on producing the hydrograph generated by individual storms, such as the 2-year flood or a less frequent flood event. In contrast, continuous simulations provide an unbroken series of discharges at daily or sub-daily (e.g., 15-min) time steps over a period of years to decades. Other hydrologic models that are commonly used for event-based and continuous simulation modeling include Hydrologic Simulation Program Fortran (HSPF) and Storm Water Management Model (SWMM). It is widely accepted that continuous simulation modeling, rather than event-based modeling, is required to assess the long-term changes in geomorphically-significant flow events (Booth and Jackson, 1997; Roesner *et al.*, 2001) that are critical in designing hydromodification mitigation strategies.

Several HSPF-based continuous-simulation models with standardized parameters have been developed specifically for use in hydromodification planning. These include the Western Washington Hydrology Model (WWHM) and the Bay Area Hydrology Model (BAHM). Hydromodification Management Plans (HMPs) in Contra Costa County, San Diego County, and Sacramento County have developed sizing

calculators for BMPs based on modeling done using HSPF models. To illustrate the point about uncertainty in mechanistic models, HSPF contains approximately 80 parameters, only about 8 of which are commonly adjusted as part of the calibration process.

Hydraulic models

These models are used to simulate water-surface profiles, shear stresses, stream power values, and other hydraulic characteristics generated by stream flow, using a geometric representation of channel segments. The industry standard 1-dimensional hydraulic model is the HEC – River Analysis System (HEC-RAS).

Coupled hydrologic and hydraulic models

These models represent a valuable tool in hydromodification management. Because the streamflow regime interacts with its geomorphic context to control physical habitat dynamics and biotic organization, it is often necessary to translate discharge characteristics into hydraulic variables that provide a more accurate physical description of the controls on channel erosion potential, habitat disturbance, and biological response. For example, a sustained discharge of 100 cfs could potentially result in significant incision in a small sand-bed channel, but have no appreciable effect on the form of a large channel with a cobble bed. By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a “common currency” for managing erosion and associated effects can be established and applied across many streams in a region. Such a common currency can improve predictive accuracy across a range of stream types. As opposed to focusing on the shear stress or stream power characteristics of a single discharge, it is usually necessary to integrate the effects of hydromodification on such hydraulic variables over long simulated periods of time (on the order of decades) to fully assess the potential for stream channel changes. By using channel morphology to estimate hydraulic variables across a range of discharges, models like HEC-RAS provide a means of translating hydrologic outputs from continuous simulations in HEC-HMS, SWMM, or HSPF into distributions of shear stress and stream power across the full spectrum of flows.

“By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a “common currency” for managing erosion and associated effects can be established and applied across many streams in a region.”

Sediment-transport models

These models such as HEC-6T, the sediment-transport module in HEC-RAS; CONservational Channel Evolution and Pollutant Transport System (CONCEPTS); MIKE 11; and FLUVIAL12 use sediment-transport and supply relationships to simulate potential changes in channel morphology (mobile boundary) resulting from imbalances in sediment continuity. This means that hydraulic characteristics are calculated as channel form and cross section evolve through erosion and deposition over time. Such models have high mechanistic detail but are often difficult to apply effectively. Although it is not a

mobile boundary model, the SIAM (Sediment Impact Analysis Method) module in HEC-RAS represents an intermediate complexity model designed to predict sediment imbalances at the stream network-scale and to describe likely zones of aggradation and degradation.

In this project, we evaluated the potential applicability of various movable bed and/or boundary models, including HEC-RAS (Brunner, 2008), CONCEPTS (Langendoen, 2000), and FLUVIAL12 (Chang, 2006) to predicting channel response to hydromodification in southern California. The tests involved modeling a prismatic floodplain with channel geometry, bed slope, and bed gradation corresponding to the Hasley Canyon study site in Orange County which represents a braided channel with a bed slope of 0.0258 and a median grain size of 1.6 mm. These tests indicated that mobile boundary hydraulic models are generally difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and bed-armoring processes (Dust, 2009). For example, normal depth computations for the downstream-most cross section at the Hasley Canyon study site indicated that the Froude number ranges from approximated 0.97 to 1.14 for estimated flows corresponding to the 2- through 100-year events. These models are designed for sub-critical flows and it is common for such near-critical flows to produce numerical instabilities. Our extensive field reconnaissance indicates that armoring and channel widening resulting from both fluvial erosion and mass-wasting processes are key influences on channel response in southern California, and these processes are not well-represented and constrained in current mobile boundary models. Sediment transport rating curves based on field measurements have the potential to improve the efficacy of these models, especially for lower energy, single thread channels that are primarily vertically adjustable.

"These tests indicated that mobile boundary hydraulic models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and bed-armoring processes."

Regime diagrams

The relationship between inflowing water and sediment loads and equilibrium channel dimensions can be described mechanistically by combining several governing equations including conservation of mass, conservation of momentum, flow resistance, and sediment transport. Analytical solutions to this system of governing equations can be summarized in a variety of ways, including charts that express channel slope and dimensions in relation to inflowing discharges of water and sediment. This project has developed a set of "regime diagrams" for assessing the potential direction and relative response of channel geometry to long-term changes in discharge and sediment supply due to hydromodification. A regime diagram is a plot of physical control variables overlain with isoclines of geometric parameters for the purpose of assessing potential channel response. *The diagrams are physically-based but designed to provide managers with a relatively simple form of output from analytical channel design models. Managers can use these diagrams to examine the channel dimensions and slope predicted the deterministic models described above without performing additional modeling.* In developing the regime diagrams, we stratified the channel types of study region into three general types (Figure 6):

1. Live-bed, sand-dominated channels,
2. Mixed-bed, gravel channels with considerable sand content, and
3. Cobble-bed channels with some gravel and sand content.

and selected governing equations that are well-suited to each geomorphic setting (Figure 7).



Figure 6. Examples of the 3 geomorphic types from southern California (courtesy of Hawley, 2009).

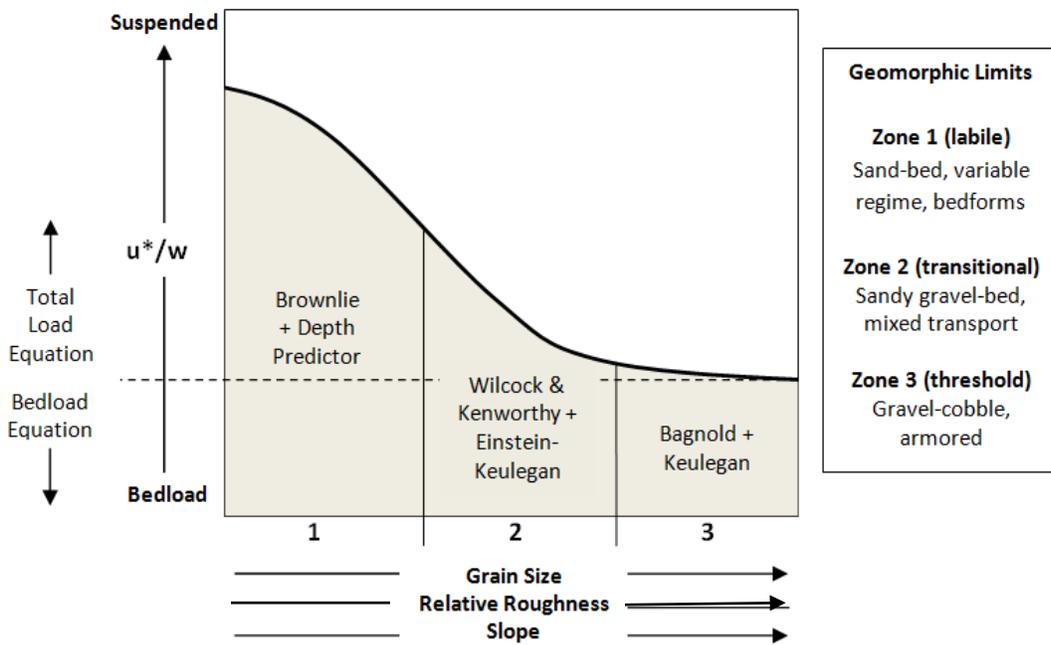


Figure 7. Geomorphic types used in this study. Labile, transitional, and threshold are terms used by Church (2006) to describe the hydraulic and sediment-transport processes occurring within each type.

Several regime diagrams were developed to provide an additional line of evidence describing the effect of long-term alterations of channel-forming discharge and the inflowing sediment concentration at that discharge on channel geometry (Figure 8). Separate diagrams have been developed for each geomorphic type using sediment-transport and flow-resistance relationships that are appropriate for those conditions. These relationships were plotted on log-log scales to compare the equilibrium channel

geometry associated with wide ranges of discharge and sediment concentrations between channels. Each regime diagram contains a series of isoclines, each corresponding to select values of width, depth, and slope.

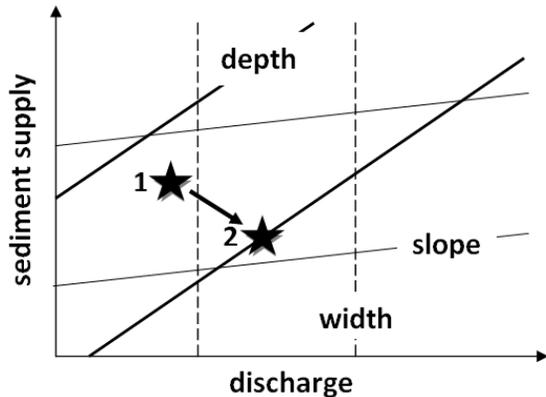


Figure 8. General framework of channel response diagrams. Long-term changes in discharge and sediment supply will be accompanied by a new equilibrium form (from plotting position 1 to 2).

Channel response diagrams for width, depth, and slope in Type 3 based on the Bagnold (1980) bedload transport equation are provided in Figures 9, 10, and 11, respectively. In these “relative response” diagrams, it is assumed that all variables are held constant except for the dependent parameter (width, depth or slope) and independent variables of relative discharge and sediment concentration. The initial state for each channel is indicated by the ratios of post-development to pre-development reference discharges of inflowing water and sediment (Q^* and Q_s^* , respectively) having values of 1 (no change). The post hydromodification state is typically represented by values of $Q^* > 1$ and $Q_s^* < 1$ (i.e., more runoff and less sediment); which translates into a new estimate of width, depth, and slope that theoretically represents the new equilibrium channel geometry. For instance, a Q^* of 2 and a Q_s^* of 0.8 would correspond to a doubling of the channel-forming discharge and a 20% reduction in sediment supply in an urbanizing watershed based on the Bagnold bedload relationship.

In the diagrams below (Figures 9 through 11), hypothetical relative changes in width, depth, and slope in response to changes in inflowing water and sediment discharges of +50% and -25%, respectively, are depicted by the dashed line labeled “regime.” For example, a more than five-fold change in width (departure from initial state of Q^* and Q_s^* equal 1; Figure 9) would be expected in the absence of concurrent slope and depth change. Similarly, the equilibrium slope required to balance inflowing water and sediment would be less than 60% of the pre-disturbance slope in the absence of width and depth change. These estimates bracket the maximum response that might be expected given a particular combination of altered discharge and sediment supply. In most instances, width, depth, and slope mutually adjust; however, in a stream with bedrock or other effective grade control, width increase would be expected to dominate the response to urbanization. In this case, the width equation would be most relevant. Alternatively, the response of a stream with highly-resistant banks and a sand bed without grade control would be expected to incise in its initial response to urbanization. In this case, the slope diagram would be most relevant. Such diagrams can also provide additional resolution to channel

susceptibility ratings in terms of expected relative changes in discharges of water and sediment. For example, this might be especially relevant for channels that rate from HIGH to VERY HIGH for lateral and/or vertical response in the SCCWRP screening tool. This would be accomplished by comparing the projected change in discharge of water and sediment based on watershed characteristics between streams in the same susceptibility class.

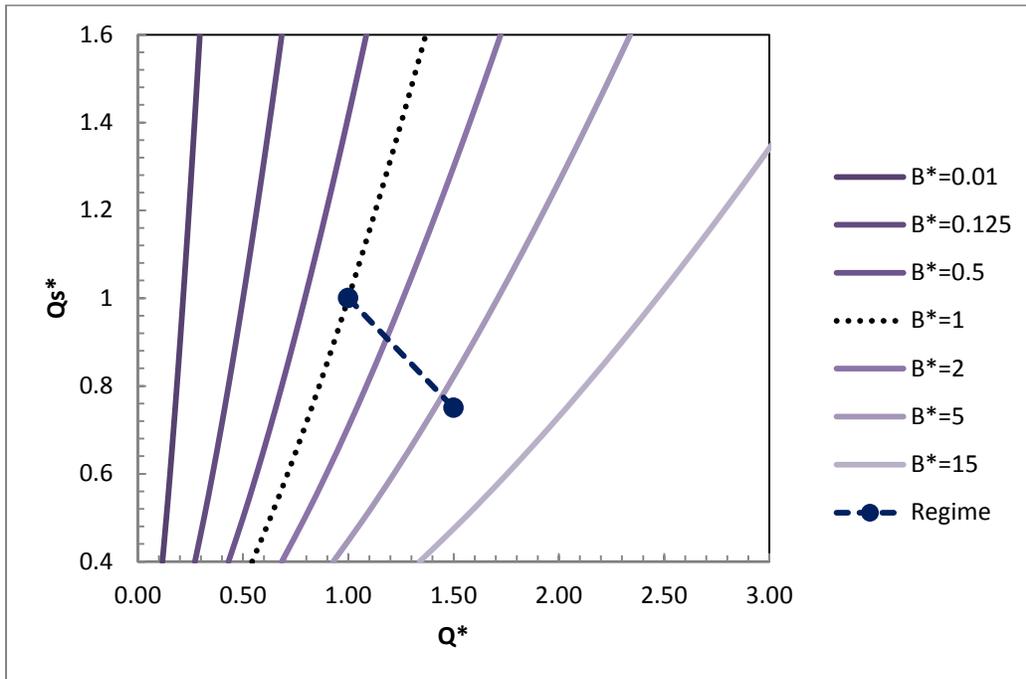


Figure 9. Maximum channel response diagram for width based on the quantitative approximation of Lane's balance using the Bagnold (1980) sediment-transport function. B^* represents an estimated maximum post-development width / pre-development width in the absence of mitigation.

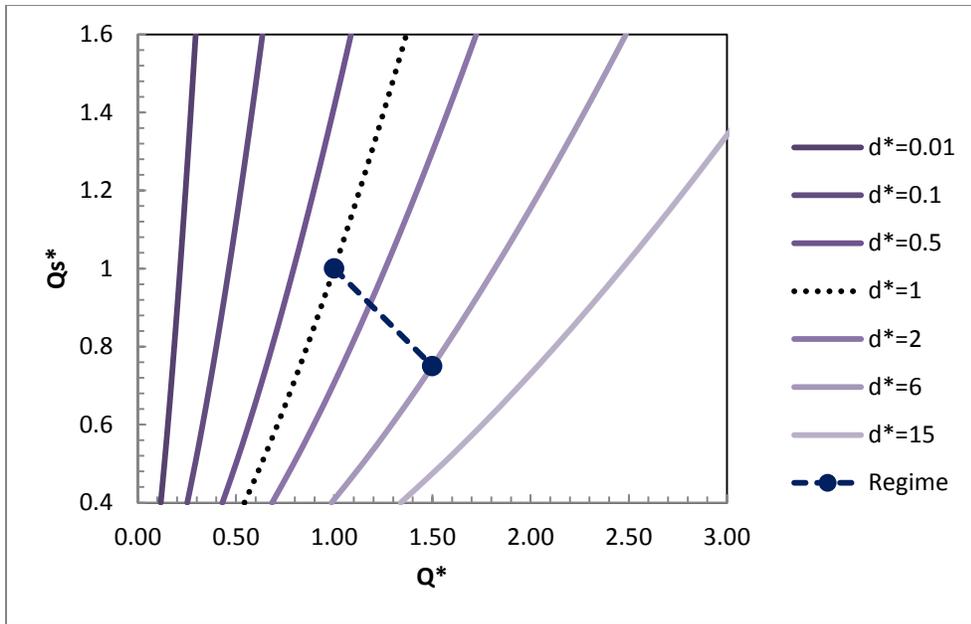


Figure 10. Maximum channel response diagram for depth based on the quantitative approximation of Lane's balance using the Bagnold (1980) sediment-transport function. d^* represents an estimated maximum post-development depth / pre-development depth in the absence of mitigation.

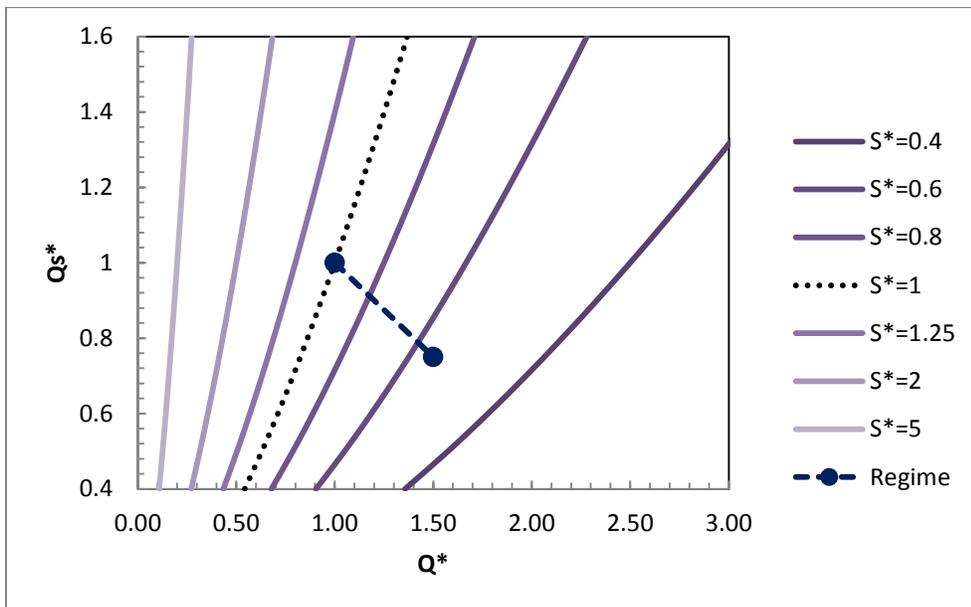


Figure 11. Maximum channel response diagram for slope based on the quantitative approximation of Lane's balance using the Bagnold (1980) sediment-transport function. S^* represents an estimated maximum post-development slope / pre-development slope in the absence of mitigation. For channels with lateral and vertical constraints, S^* values greater than one suggest aggradation, while those less than one suggest degradation.

Regime diagrams expressing absolute values of slope and depth in relation to channel-forming discharge and inflowing sediment concentration were developed by constraining width predictions based on field data collected in this study. Regime diagrams based on the median relationships for downstream hydraulic geometry in Types 1 and 2 are illustrated below (Figures 12 and 13, respectively). The resulting diagrams are unique in that they are based on regional stream width data stratified by type, as opposed to estimating widths by invoking a theoretical hypothesis like minimum stream power (Chang, 1988) or neglecting width by using a unit discharge of water and sediment (Parker, 1990).

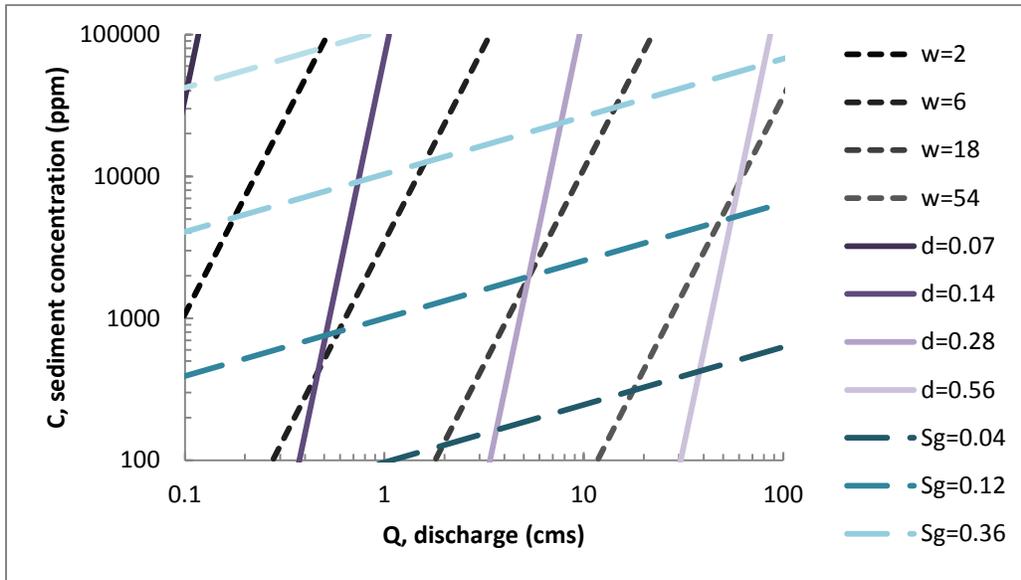


Figure 12. Type 1 regime diagram for absolute values of width, depth, and slope/ $d_{50}^{0.5}$ (S_g).

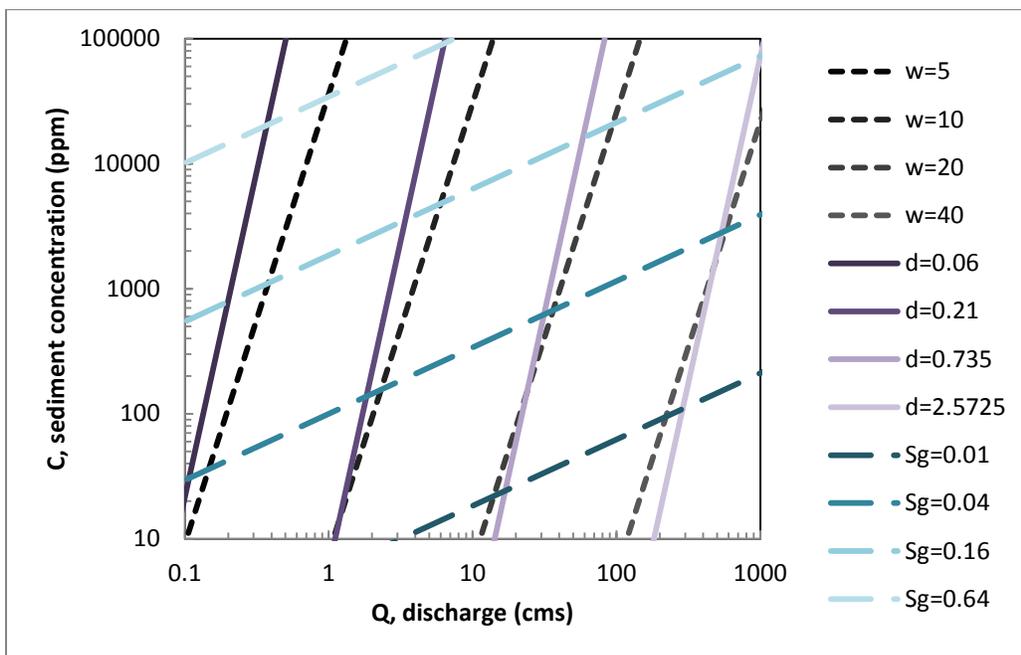


Figure 13. Type 2 regime diagram for absolute values of width, depth, and slope/ $d_{50}^{0.5}$ (S_g).

The regime diagrams based on field-calibrated widths are arguably more directly applicable to southern California than those previously available. Although regime diagrams for sand- and gravel-bed channels have already been developed (Buffington and Parker, 2005; Chang, 1980, 1985), they vary markedly in underlying framework, and were developed using different assumptions, parameters, and procedures that are not transferable across the broad spectrum of stream types encountered in southern California. This approach is unique in its development of a series of hydraulic geometry functions and regime diagrams based on a combination of regional channel data and governing equations categorized by channel type. This framework allows for comparisons between channel types, and allows users to assess the relative susceptibility of differing channel types to hydromodification. Another aspect of this approach is that it can be developed for any study area, and updated when new data are made available, as regional regression models for width and sediment gradation can be easily developed from existing or new field data. Although we selected large ranges of sediment size to represent transitional and threshold channels, the boundaries of geomorphic types are flexible based on field observations and measurements. The use of synthetic channel data and theoretical regression models increase the effective sample size, and models the mutual adjustment of geometric parameters based on the governing equations of flow continuity, flow resistance, and sediment-transport continuity.

Our approach has several limitations including the calibration ranges of the data used to develop the underlying regression models, several simplifying assumptions, and the inherent difficulty of estimating changes in sediment supply. For example, it was necessary in a few instances to extrapolate sediment transport functions beyond the range of field and laboratory conditions in which they were calibrated to accommodate large predicted increases in water and sediment supply from watersheds undergoing hydromodification. Moreover, our relatively small sample sizes have artificially limited the range of variability inherent to channel types observed within the study area. Spatial and temporal variability are also simplified through the use of reach-averaged characteristics and one-dimensional, steady, uniform flow at single return interval discharges. An assumption of rectangular channel geometry was used to simplify in-channel hydraulics and sediment transport analyses. We performed a sensitivity analysis that provided some insight into how the models respond to variability in input parameters; however, this analysis was not exhaustive. For example, in the development of diagrams for transitional channels, the median grain size of sand in the gravel matrix was fixed to 1 mm. This assumption was necessary to simplify an otherwise unwieldy sediment-transport function.

It is important to underscore that the diagrams were developed to examine trends in single-thread quasi-equilibrium channel geometry due to long-term changes in discharge and sediment supply from urbanizing watersheds. As such, the approach does not make short-term predictions of transient channel response, such as incision or widening, nor do the models describe the sequence of channel evolution stages that might occur during the time period that a watershed is urbanized and the receiving channels respond. Rather, the diagrams can be used to predict the likely ultimate channel response to changes in factors affected by development or mitigation (e.g., flow and sediment). The predicted channel responses are best utilized in a comparative sense to assess relative response potential between channels in different watershed settings. For example, one could compare the potential response of two streams that have different levels of estimated sediment supply and net change in

runoff potential based on the GLU method described above. Although these two streams might be in the same susceptibility class based on a rapid field screening, the regime diagrams would indicate non-linear differences in the potential magnitude of width, depth, and slope response to altered water and sediment inputs. Some users may find it difficult to understand separate predictions of ultimate channel depth versus slope, given that the channel depth to the top of bank will increase with incision (slope decrease) and decrease with aggradation that can result in a slope increase. The depth prediction represents the theoretical depth that would be necessary to balance sediment and water continuity if slope and width did not change. It is not the depth that results in response to some other slope change. *For practical applications, it is recommended that managers focus on relative potential changes in width and slope as the primary indicators of channel response potential.*

The regime diagrams are mechanistic models based on physical relationships governing hydrogeomorphic processes within the study area; however, the models should not be used in isolation without consideration of the cumulative error and uncertainty that are inherent. Given the necessary assumptions involved in their formulation and application, regime diagrams are not intended to be used as a stand-alone tool for predicting channel responses. Instead, they should be used in conjunction with other hydromodification tools described in this report to develop multiple lines of evidence for bracketing the possible range of channel responses to perturbations in discharge and inflowing sediment. Future versions of these tools could potentially be designed to explicitly replace single event descriptions of inflowing water and sediment with descriptors of long-term cumulative transport capacity and bed sediment supply rate. In either case, other modeling tools described below must be used to generate estimates of changes in inflowing water and sediment, and this remains the primary challenge (especially inflowing sediment) in applying these tools.

Empirical/statistical models

These models describe associations between response variables and predictor variables, and the extent to which variation in output can be explained by input data. In the context of hydromodification management, statistical models are developed to describe empirical relationships that help predict stream responses to stressors like increased streamflow volumes and rates. With sufficient data, statistical models can be developed to describe significant associations between land use change and hydrologic, geomorphic, and/or biological responses. Such relationships do not mechanistically link cause and effect but can nevertheless provide important evidence for making management decisions, including evaluating the performance of mechanistic models. For example, most lower-order streams affected by hydromodification are ungauged and streamflow characterization necessarily relies on modeling. Statistical models provide a relatively-simple alternative to rainfall-runoff modeling if there are comparable streamflow gages that can be extrapolated to an ungauged site and a truly continuous series of streamflows is not required. Statistical predictions of streamflow metrics in ungauged basins also support mechanistic modeling

Regime diagrams should do not make short-term predictions of transient channel response, such as incision or widening. Rather, the diagrams can be used to predict the likely ultimate channel response to changes in factors affected by development or mitigation (e.g., flow and sediment).

efforts by providing information that can be used for model testing when calibration data are not available. In this project, we developed regional statistical models of streamflow that support a wide range of hydromodification modeling efforts aimed at assessing channel susceptibility and predicting geomorphic response to urbanization (Hawley and Bledsoe, 2011). In particular, the regression models can be used to estimate changes in both peak flows and flow durations that result from unmitigated watershed urbanization. The prediction of pre- and post-development flow-duration curves at ungauged sites provides a relatively-straightforward means of estimating erosion potential metrics that can be used in probabilistic models of channel response.

Statistical models have also been used to explain variance in channel enlargement in response to hydromodification based on measures of watershed urbanization, erosive energy, and other factors. Such models sometimes include independent variables derived from the mechanistic models described above; however, a key difference is that statistical models are not designed to explicitly represent actual physical processes in their mathematical structure. Instead, these models simply express observed correlations between dependent and independent variables. Like mechanistic models, the output from these models is commonly treated deterministically as a precise answer for use in management decisions, despite the fact that estimates from most statistical models could be readily (and more realistically) expressed in terms of distributions or prediction intervals with a range of uncertainty. As part of this project, we developed multivariate regression models of cross-sectional channel enlargement at 61 sites in southern California. Results indicate that channel enlargement is highly dependent on the ratio of post- to pre-urban sediment-transport capacity over cumulative duration simulations of 25 years (load ratio, a.k.a. erosion potential, E_p), which explained nearly 60% of the variance (Tables 1 and 2 and Figure 14). A logistic regression analysis of the same sites (classified categorically as stable vs. unstable channels) with erosion potential as the sole predictor variable indicates that E_p values of 0.79, 1.0, 1.23, and 2.0 correspond to 10, 27, 50, and 92% risk of instability, respectively (Figure 15). Classification accuracies for stable and unstable sites were 93 and 73%, respectively. The appreciably high probabilities of instability associated with values of erosion potential near unity likely reflect the influence of decreased sediment delivery, i.e., matching the flow duration curve for a wide spectrum of erosive flows may not be sufficiently protective of channel stability when inflowing sediment loads are substantially decreased through impervious and other land use changes.

"Results indicate that channel enlargement is highly dependent on the ratio of post- to pre-urban sediment-transport capacity over cumulative duration simulations of 25 years (load ratio, a.k.a. erosion potential), which explained nearly 60% of the variance."

Table 1. Channel enlargement risk factors. Ranked in relative order of importance based on how well they explain changes in channel cross-sections over time.

Variable	Description	Qualitative Influence	Partial R ² [§]	
			n = 66	n = 61 [*]
Lr (Ep)	Sediment-transport capacity load ratio (erosion potential) between 25-yr developed and undeveloped DDF simulations: $L_{\text{developed}}/L_{\text{undeveloped}}$ (m ³ /m ³)	+	.28	.58
Imp	total impervious area as fraction of total drainage area (m ² /m ²)	+	.21	.56
D_{hp}/W₁₀	downstream distance to nearest 'hardpoint' (bedrock or artificial) scaled by top width at 10-yr flow (m/m). term goes to 0 if Lr < 1.20 for d₅₀ > 16 mm OR if Lr < 1.05 for d₅₀ < 16 mm	+	.32	.34
Chnlz	binary variable representing historic channelization along reach (0 = unchannelized, 1 = channelized)	+	.20	.01
Confined	binary variable representing valley confinement as defined as a Valley Width Index (VWI) threshold of 2 (0 = VWI > 2, 1 = VWI < 2)	-	.01	.02
Srf	average surface slope of watershed (m/m)	+	.02	.01
DD	drainage density: total stream length via National Hydrography Dataset (NHD) / total drainage area (km/km ²)	+	.01	.01
Veg	binary variable representing bank vegetation (0 = poor, 1 = dense)	-	.03	.01
Cohesion	binary variable representing relative bank cohesion (0 = low, 1 = high)	-	.01	.01

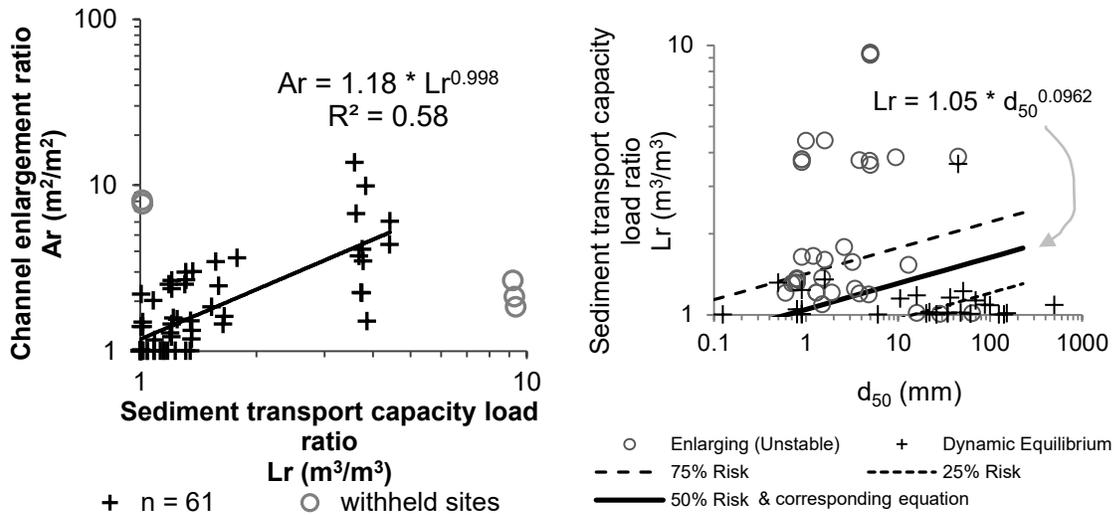
[§] typical partial R² based on model forward selection

^{*} withheld stream reaches where enlargement was primarily driven by historic channelization (San Antonio) or kept artificially low due to dense vegetation (Agua Hedionda); both factors were poorly distributed in our dataset

Table 2. Enlargement models and performance.

Enlargement Function, n = 66	Adj. R ²	p-value Exceptions
$Ar = 0.757 * Lr^{0.433} * (D_{hp}/W_{10})^{0.133} * e^{(1.65*Srf)} * e^{(-0.373*Veg)} * e^{(0.613*Chnlz)}$	0.58	
Enlargement Functions after Systematic Screening[§], n = 61		
$Ar = 0.845 * Lr^{0.831} * (D_{hp}/W_{10})^{0.0751} * e^{(1.11*Srf)} * e^{(-0.246*Veg)}$	0.61	Veg = 0.14, Srf = 0.05
$Ar = 0.863 * e^{(8.83*Imp)} * (D_{hp}/W_{10})^{0.0862} * e^{(0.987*Srf)} * e^{(-0.252*Veg)}$	0.60	Veg = 0.13, Srf = 0.09
$Ar = 0.885 * Lr^{0.846} * (D_{hp}/W_{10})^{0.0770} * e^{(0.715*Srf)}$	0.60	Srf = 0.16
$Ar = 0.906 * e^{(8.98*Imp)} * (D_{hp}/W_{10})^{0.0885} * e^{(0.575*Srf)}$	0.59	Srf = 0.26
$Ar = 0.868 * Lr^{0.904} * (D_{hp}/W_{10})^{0.0650} * e^{(0.149*DD)}$	0.60	DD = 0.17
$Ar = 1.09 * Lr^{0.836} * (D_{hp}/W_{10})^{0.0614}$	0.59	
$Ar = 1.07 * e^{(8.97*Imp)} * (D_{hp}/W_{10})^{0.0750}$	0.59	
$Ar = 1.18 * Lr^{0.998}$	0.57	
$Ar = 1.18 * e^{(11.0*Imp)}$	0.55	

[§] withheld stream reaches where enlargement was primarily driven by historic channelization (San Antonio) or kept artificially low due to dense vegetation (Agua Hedionda); both factors were poorly distributed in our dataset



(a) enlargement vs. erosion potential

(b) risk of enlargement associated with d_{50} and erosion potential

[§] based on the withholding of two stream reaches where enlargement was primarily driven by historic channelization (San Antonio) or kept artificially low due to dense vegetation (Agua Hedionda); both factors were poorly distributed in our dataset

Figure 14. Models of cross-sectional channel enlargement[§]: a) power regression of Lr vs. enlargement indicating that channel enlargement increases with increasing erosional potential, and b) multivariate logistic regression of stable vs. enlarged channels as a function of Lr and d_{50} . This model indicates increasing risk of enlargement with decreasing grain size and erosion potential (Hawley and Bledsoe, In Review).

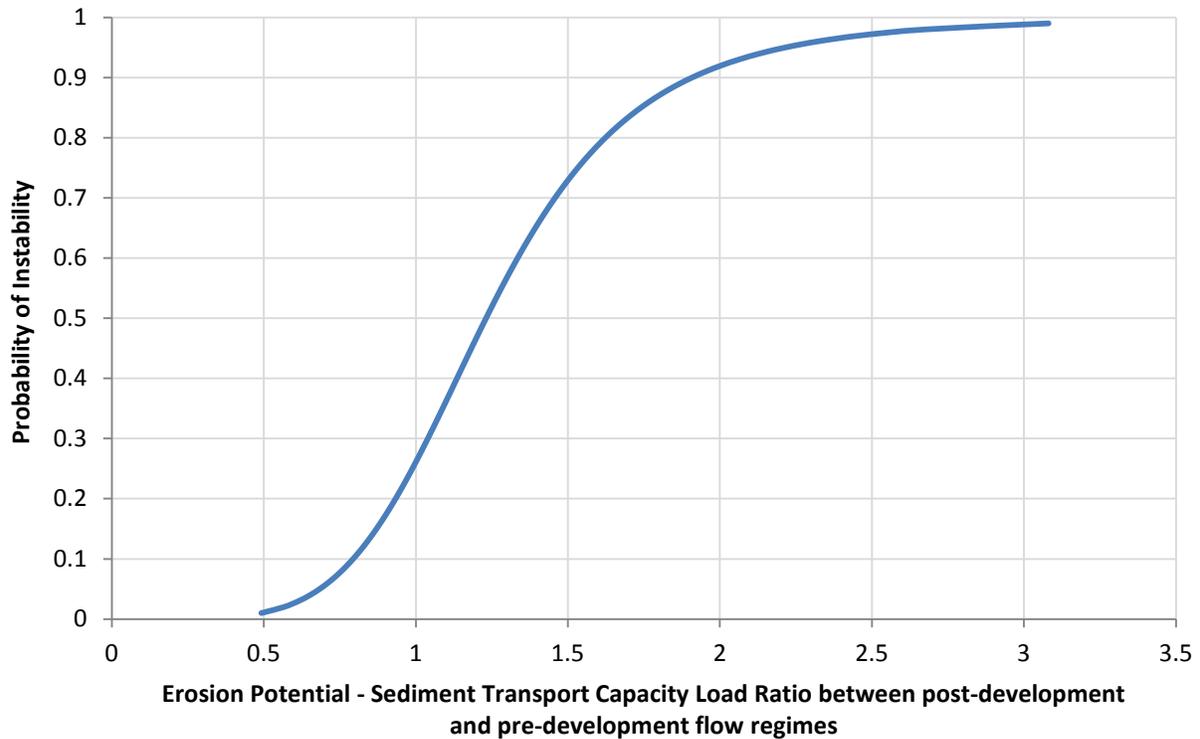


Figure 15. Logistic regression model based on classification of stable vs. unstable streams at 61 sites in southern California described by Hawley and Bledsoe (In Review) indicates increasing risk of channel instability with increasing erosion potential. The vertical axis represents the probability of stream instability which increases rapidly for channels with sediment-transport capacity increased by hydromodification.

Results consistently indicate that susceptibility tends to increase with increasing erosion potential and distance from a downstream hardpoint, and decreasing bed-material particle size. Most of the variance in cross-sectional channel enlargement could be explained by the downstream distance to a hardpoint and the cumulative sediment-transport imbalance quantified over 25-year simulations. For example, ~five-fold enlargement was correlated to $D_{hp}/W_{10} \sim 30$ and $Lr \sim 3.5$ (~15% imperviousness); ~two-fold enlargement would be expected with the same hardpoint distance and $Lr \sim 1.2$ (~5% imperviousness).

The models demonstrate that the risk of adverse morphologic channel responses is best reduced by minimizing increases in time-integrated sediment-transport capacity on future developments. This conclusion was further affirmed with statistically-significant ($p < 0.0001$) logistic-regression models based on erosion potential and d_{50} , which suggested that fine-grained systems, especially those with d_{50} less than 16 mm, have little capacity to resist any increases in sediment-transport potential. Thus, the statistical models point to the importance of balancing the post-development sediment transport to the pre-development setting over a ~25-year range of sediment-transporting flows rather than a single flow in order to reduce the risk of adverse channel responses to hydromodification. The primary step to achieving this criterion in management is matching the pre-development flow duration curve above the shear stress that mobilizes the most erodible channel boundary, which is often the bed material.

Integrative tools that support statistical models

Integrative tools are designed to combine hydrologic and geomorphic data to identify physically-based descriptors of channel-forming discharges, frequency distributions of stream power and shear stress, and cumulative sediment transport. In most instances, such tools are created by analysts in spreadsheet applications because there are very few “off-the-shelf” software packages that perform these types of calculations. One exception is GeoTools, an existing suite of analysis tools for fluvial systems written in Visual Basic for Applications (VBA) / Excel[®]. Based on flow time series and basic geomorphic data, GeoTools automates computation of numerous hydrologic, hydraulic, and geomorphic descriptors including effective discharge, sediment transport and yield, temporal distributions of hydraulic parameters (e.g., shear stress and specific stream power), cumulative erosion potential, channel stability indices, and over 100 flow regime metrics (Bledsoe *et al.*, 2007). GeoTools accepts input flow records in standard US Geological Survey (USGS) format and a variety of other formats and temporal densities. The package also serves as a post-processor for SWMM and HSPF / Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) model output.

As newer versions of Excel[®] have become available since GeoTools was developed in Excel[®] 2003, some of the original functionality of GeoTools has not transferred due to changes in Excel[®] 2007 and 2010 (e.g., reference libraries and chart options in VBA). In this project, we updated GeoTools to make it fully functional in Excel[®] 2010. This facilitates the calculation of erosion potential and flow metrics, and allows users to readily generate several new charts related to effective discharge analysis and other analyses that combine continuous streamflow records and sediment-transport relationships (Figure 16). The erosion potential metrics output by GeoTools are a key input for the channel enlargement models developed in this study and the probabilistic models described in the next section.

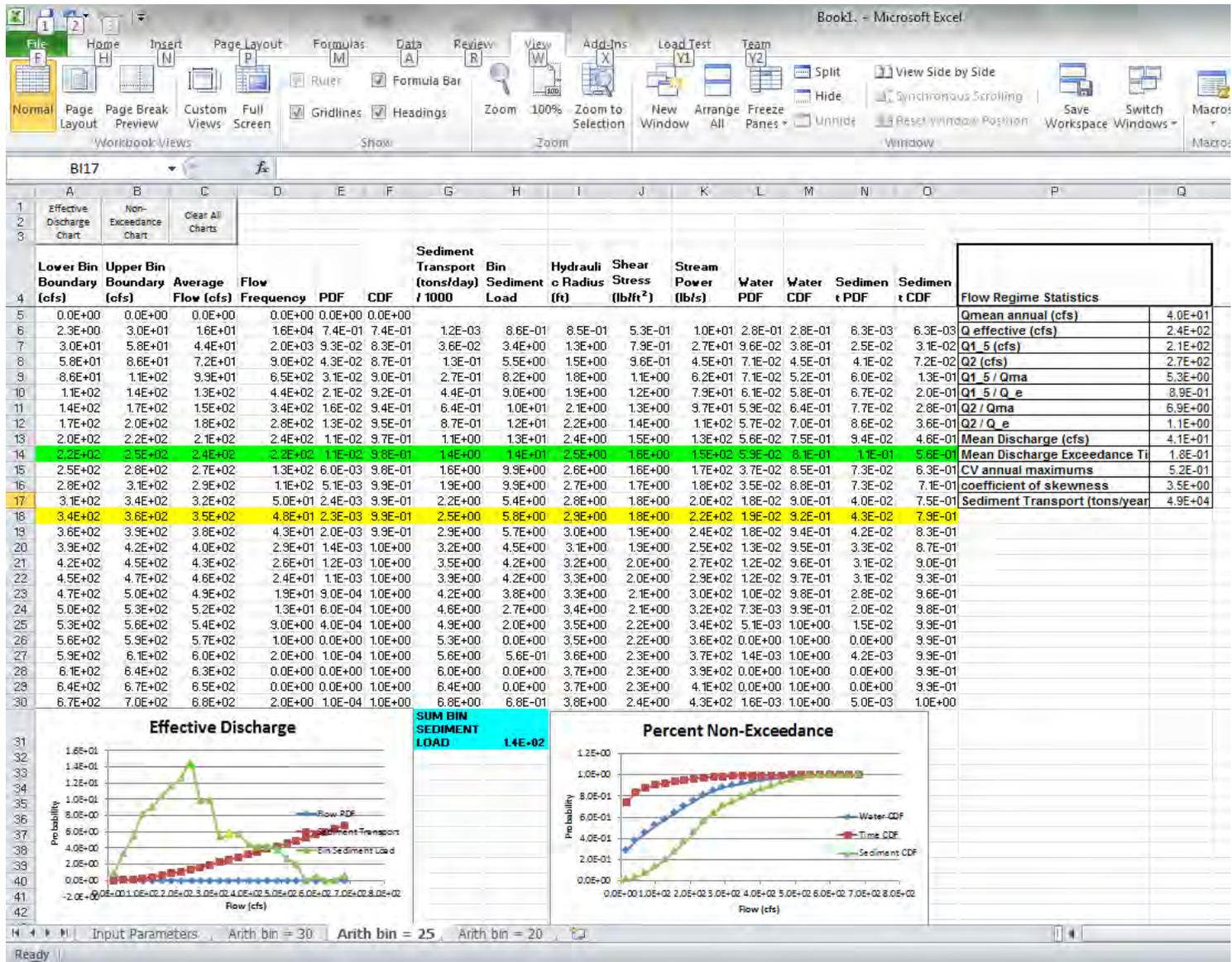


Figure 16. Example output from effective discharge / erosion potential module of GeoTools updated for Excel 2010.

2.1.3 Probabilistic / Risk-based Models

Probabilistic / risk-based models integrate many of the tools discussed above, using modeled changes in hydrology as input to hydraulic models, which in turn provide input to various types of statistical models to predict response. However, the predictions based on these inputs are not represented as deterministic outputs. Instead, the range of (un)certainty in the likelihood of the predicted response is explicitly quantified. Although not commonly used for hydromodification management at this time, there are well-established models of this type that are currently in use in other scientific disciplines. An example of a probabilistic approach that has been used for hydromodification management is a logistic regression analysis that was used to produce a threshold “erosion potential metric” that can be used to quantify the probability of a degraded channel state. More details on this approach are provided below in the section on suites of modeling tools.

In this project, we examined the use of General Regression Neural Network (GRNN) models to predict channel enlargement due to the effects of hydromodification on regional streams. Results indicated that this and other artificial neural network (ANN) modeling techniques represent a viable probabilistic modeling approach for hydromodification management. When applied to our field dataset, the GRNN models indicated that estimated increases in Q_2 , based on regional flood regression equations (Hawley and Bledsoe, 2011), consistently ranked as the most important predictor of channel enlargement despite the inclusion of a large pool of watershed and geomorphic descriptors at various spatial scales. The best models also consistently included key variables used in the SCCWRP Colorado State University (CSU) susceptibility screening tool such as distance to hardpoint, Valley Width and Valley Expansion Ratio that are not directly related to the extent of watershed development. Few attempts have been made to comprehensively model a broad set of parameters that influence geomorphic response in southern California streams, mostly due to the computational limitations of deterministic models and the relative simplicity of regression models. This project has shown that GRNNs can capture many of the non-linear relationships that influence hydromodification response in channels of southern California and provide quantitative estimates of change and the uncertainty associated with those estimates.

“When applied to our field dataset, the GRNN models indicated that estimated increases in Q_2 , based on regional flood regression equations, consistently ranked as the most important predictor of channel enlargement despite the inclusion of a large pool of watershed and geomorphic descriptors at various spatial scales.”

Like all models, GRNNs come with caveats and inherent weaknesses, such as, the choice of model inputs, network structures and internal model parameters, and method of pre-processing of model inputs (Maier and Dandy, 2000). Because most ANN models are data-driven (Chakraborty *et al.*, 1992) and are able to determine critical parameters, users tend to pay little attention to the selection of appropriate model inputs (Faraway and Chatfield, 1998). It is important to ensure that the model includes process-based surrogate measures of response drivers and mechanisms that can accurately represent the real system, and are not just built on available data. GRNNs rely on associations between target and predictor variables; therefore, the more process-based the predictor variables used, the less

complex a GRNN will need to be. For example, in this study the GRNN that was developed with the urban-amplified Q_2 required 25% fewer variables to match the performance of the higher recurrence interval flow models, which did not inherently reflect watershed imperviousness. Pre-processing for GRNN networks includes standardization to ensure all variables are treated equally (Maier and Dandy, 2000). Scaling the variables to fall within the limits of activation functions used in the outer layer is also recommended as a pre-processing step (Maier and Dandy, 2000; Minns and Halls, 1996). Nevertheless, GRNNs can help in support of rating channel susceptibility to hydromodification and identifying target variables for detailed data collection. In this way, GRNN can be used to support not only predictive modeling, but also to inform effective field monitoring and assessment programs. Overall, our results suggest that GRNN predictions can be used in concert with other tools to help inform management decisions, such as the need for flow duration based stormwater controls, and to tailor monitoring programs.

A probabilistic representation of possible outcomes also improves understanding of the uncertainty that is inherent in model predictions, and can inform management decisions about acceptable levels of risk.

2.2 Strengths, Limitations, and Uncertainties

The organizing framework shown in Figure 1 depicts the applicability of the three major categories of tools in support of various management actions. This section addresses a range of issues relating to strengths, limitations, and uncertainty of the tools discussed above. Detailed analysis of individual models is beyond the scope of this document, but *EPA/600/R-05/149* (Shoemaker *et al.*, 2005) contains an extensive comparison of functions and features across a wide range of hydrologic and hydraulic models.

General considerations

The well-known statistician George Box famously said that “all models are wrong, some are useful.”

The usefulness of a model for a particular application depends on many factors including prediction accuracy, spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding.

There is no cookbook for selecting models with an optimal balance of these characteristics. Models of stream response to land use change will always be imperfect representations of reality with associated uncertainty in their predictions. In addition to the prediction errors of standard hydrologic models, common limitations and sources of uncertainties include insufficient spatial and/or temporal resolution, and poorly-known parameters and

“Ultimately, the focus of scientific study in support of decision making should be on the decisions (or objectives) associated with the resource and not on building more-detailed models with the hope that they will provide the answers that elude us.”

...

“The predictive models that hold the most promise in hydromodification management are best thought of as predictive scientific assessments; that is, flexible, changeable mixes of small mechanistic models, statistical analyses, and expert scientific judgment.”

boundary conditions. Ultimately, the focus of scientific study in support of decision-making should be on the decisions (or objectives) associated with the resource and not on building more-detailed models with the hope that they will provide the answers that elude us. Each model has limitations in terms of its utility in addressing decisions and objectives of primary concern to stakeholders. Prediction error in terms of decision endpoints, not perception of mechanistic correctness, should be the most important criterion reflecting the usefulness of a model (NRC, 2001; Reckhow, 1999a,b). The predictive models that hold the most promise in hydromodification management are best thought of as predictive scientific assessments; that is, flexible, changeable mixes of small mechanistic models, statistical analyses, and expert scientific judgment.

Region-specific considerations

Because all models are vulnerable to improper specification and omission of significant processes, caution must be exercised in transferring existing models to new regional conditions. For example, mobile boundary hydraulic models are mechanistically detailed but not generally well-suited to many southern California streams given the prevalence of near-supercritical flow, braiding, and split flow. In addition, bed armoring and channel widening resulting from both fluvial erosion and mass-wasting processes are key influences on channel response in semiarid environments. These processes are not well-represented and constrained in current mobile boundary models. Accordingly, the appropriateness of existing models for addressing a particular hydromodification management question should be empirically tested and supported with regionally-appropriate data from diverse stream settings.

Sediment supply

As described above, a reduction in sediment supply to a stream may result in instability and impacts, even if pre- and post-land use change flows are perfectly matched. Thus, there is a need to develop management approaches to protect stream channels when sediment supply is reduced, and to refine and simplify tools to support these approaches. This continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well-understood and poorly represented in current models. As a starting point, models used to analyze development proposals that reduce sediment supply could be applied with more protective assumptions with respect to parameters and boundary conditions (inflowing sediment loads). Effects of altered sediment supply on stream response could be addressed in a probabilistic framework by adjusting conditional probabilities of stream states to reflect the influence of reductions in important sediment sources due to land use change.

Managing uncertainty

To date, hydromodification management has generally relied on oversimplified models or deterministic outputs from numerical models that consume considerable resources but yield highly uncertain predictions that can be difficult to apply in management decisions. Numerical models are nevertheless an important part of the hydromodification toolbox, especially in characterizing rainfall-response and hydraulic behavior over decades of land use change. It is challenging to rigorously quantify the prediction accuracy of these mechanistic numerical models; however, their utility can be enhanced by addressing prediction uncertainties in a number of ways (Cui *et al.*, 2011). Candidate models can, for

example, be subjected to sensitivity analysis to understand their relative efficacy for assessment and prediction of hydromodification effects. Moreover, it should also be demonstrated that selected models can reasonably reproduce background conditions before they are applied in predicting the future. Modeling results that are used in relative comparisons of outcomes are generally much more reliable than predictions of absolute magnitudes of response.

Hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and stream response. Deterministic representations of processes and responses can mask uncertainties and can be misleading unless prediction uncertainty is explicitly quantified. Errors may be transferred and compounded through coupled hydrologic, geomorphic, and biologic models. Accordingly, explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. This points to two basic needs. First, there is a need to develop more robust probabilistic modeling approaches that can be updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical models based on field surveys of stream characteristics, and expert judgment. Second, the uncertainty inherent to hydromodification modeling underscores the need for carefully-designed monitoring and adaptive management programs.

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...

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A probabilistic / risked-based framework can provide a more rational and transparent basis for prediction and decision-making by explicitly recognizing uncertainty in both the reasoning about stream response and the quality of information used to drive the models. Prediction uncertainty can be quantified for any of the types of models described above; however, some types are more amenable to uncertainty analysis than others. For example, performing a Monte Carlo analysis of a coupled hydrologic-hydraulic model is a very demanding task. A simple sensitivity analysis of high, medium, and low values of plausible model parameters is much more tractable and still provides an improved understanding of the potential range of system responses. Such information can be subsequently integrated with other model outputs and expert judgment into a probabilistic framework. For example, Bayesian probability network approaches can accommodate a mix of inputs from mechanistic and statistical models, and expert judgment to quantify the probability of categorical states of stream response. Such networks also provide an explicit quantification of uncertainty, and lend themselves to continual updating and refinement as information and knowledge increase over time. As such, they

have many attractive features for hydromodification management, and are increasingly used in environmental modeling in support of water quality (Reckhow, 1999a,b) and stream-restoration decision-making (Stewart-Koster *et al.*, 2010).

2.3 Summary of Modeling Tools

At present, there is no definitive inventory and evaluation of hydromodification modeling tools in terms of the specific management questions the models address, relationships between models, and data requirements. Moreover, there are no formal guidelines for helping managers review and evaluate the appropriateness of modeling-based hydromodification analyses. With this goal in mind, Table 3 was developed to provide a tentative summary of the models that are currently considered most relevant to hydromodification management. It is important to note that decisions regarding which models to apply should be made based on a consideration of the questions being asked, the level of certainty required in the output, and ability to compile or collect necessary input data. In addition, the complexity and condition of the watershed of interest should be considered when selecting modeling tools.

Table 3. Summary of the models that are currently considered most relevant to hydromodification management.

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ⁹
Descriptive (D) Tools								
Rapid riparian/wetland assessments	CRAM	D	Level of wetland / riparian function?	reach to segment	Complements geomorphic assessment tools.	Field visit, readily available GIS and desktop data.	Low - Moderate	Were protocols properly followed?
Rapid channel susceptibility assessments	Bledsoe <i>et al.</i> , 2010, 2012	D	Relative channel susceptibility to hydromodification High, Medium, or Low?	reach to segment	Complements riparian assessment tools, vertical and lateral rating point to additional modeling tools, suggests in a coarse sense the level of mitigation that may be required.	Field visit, readily available GIS and desktop data.	Low - Moderate	Were protocols properly followed? For relative comparisons of susceptibility.
Geomorphic Landscape Units	Booth <i>et al.</i> , 2011	D	Where will development most affect runoff processes? Where are key sources of coarse sediment supply to stream channels? Where are priority areas for restricting development to maintain watershed processes? Where might "over-control" be necessary to mitigation reductions in sediment supply?	watershed - region	Complements channel stability assessments, land use planning.	Readily available GIS data.	Low - Moderate	Were protocols properly followed? For relative comparisons of potential sediment delivery.
Channel Evolution Model	Schumm <i>et al.</i> , 1984; Hawley <i>et al.</i> , 2012	D	What is the sequence of incision and/or braiding that can be expected over decades in disturbed channels? What geomorphic thresholds are most relevant to understanding channel response? How can unstable channels be classified for targeting rehabilitation measures?	reach to watershed	Identifies geomorphic thresholds quantified by braiding/incision predictors, highlights key processes that models of channel response may need to account for.	Field visit, expertise in fluvial geomorphology.	Low - Moderate	Are the predictions of other channel response models consistent with this framework, which processes / thresholds in the CEM are not accounted for in a modeling analysis?

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ⁸
Mechanistic (M) / Empirical-Statistical (E/S)								
Rainfall-runoff models	HSPF, SWMM, HEC-HMS	M	What are the estimated streamflows at an ungauged site? How will different types of land use change affect streamflow? How will peak flows change (single event modeling)? How will the long-term streamflow regime change in terms of magnitude, frequency, duration, flashiness, etc. (continuous modeling)?	watershed	Provide inputs in hydraulic models, shear stress and effective discharge calculators, SIAM, mobile boundary models. Continuous simulation outputs necessary to create flow-duration curves and to estimate important metrics like erosion potential for probabilistic models.	Several watershed GIS layers (e.g., precipitation, land cover, soils), streamflow data needed for calibration - long-term records of precipitation, land use change, calibration data required for continuous simulation.	Low - High, depends on data availability, calibration and testing	Is there match in the spatial and temporal scales and vintage of input data, are infiltration parameters consistent with standardized values for the study region, were 15-min data generated for flashy streams, was the model calibrated and validated?
Regional streamflow regressions	Hawley and Bledsoe, 2011	E/S	What are estimates of streamflow metrics at ungauged sites? How will urbanization affect streamflow at this ungauged site? How will peak flows and flow durations change in response to urbanization?	watershed	Complement rainfall-runoff models by providing an additional estimate of flow characteristics that is relatively straightforward to estimate. Can be used as a check of more detailed hydrology models.	Watershed GIS layers.	Moderate if not extrapolated beyond calibration data	Are the regressions applied within the range of conditions used to develop the model?
Hydraulic models	HEC-RAS	M, E/S	What are the hydraulic characteristics (e.g., shear stress, stream power) in a stream at a given discharge (or over some hydrograph)?	watershed to reach	Provides relationships between discharge and hydraulic variables like depth, slope, shear stress and stream power that are required inputs for any model that performs sediment-transport calculations.	Channel and structure geometry, flow resistance values, boundary conditions, and other parameters.	Low - High, depends on data availability, calibration and testing	How accurate are the channel geometry data, flow resistance parameters? Are structures and boundary conditions correctly specified?

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ^s
Mechanistic (M) / Empirical-Statistical (E/S) (Continued)								
Erosion models	WEPP (Water Erosion Prediction Project), SWAT (Soil and Water Assessment Tool)	M, E/S	How will hillslope erosion and watershed sediment delivery change in response to a change in land use or natural disturbance?	site - watershed	Provides an estimate of sediment delivery that can be used in sediment budgets and as a boundary condition in channel response models including mobile boundary models.	Several watershed GIS layers (e.g., precipitation, land cover, soils), sediment-delivery data needed for calibration – long-term records of precipitation, land use change, sediment data for calibration required for continuous simulation.	Very high	Difficult to obtain order of magnitude accuracy. Unreliable for most hydromodification applications except for relative comparisons of potential sediment delivery.
Gross erosion models	RUSLE2 (Revised Universal Soil Loss Equation)	E/S	How will gross erosion change in response to a change in land use or natural disturbance?	site - region	Provides an estimate of sediment delivery that can be used in sediment budgets and in models of relative channel response such as regime diagrams.	Readily available GIS data and table values needed. Some hydrologic data may be needed depending on model selection. Erosion data needed for testing.	High	Most accurate at annual time scales in relative comparisons of gross erosion. Must also account for gullies, sediment delivery.
Braiding / incision thresholds	Hawley <i>et al.</i> , 2012	E/S	Is this stream currently near a threshold of abrupt change in terms of accelerated widening or downcutting and bank failures?	reach to segment	Can be embedded in susceptibility screening tools, quantitative channel evolution models, and regime diagrams. Choice of incision vs. braiding discriminator requires understanding of channel evolution and boundary conditions.	Geomorphic and hydraulic characteristics – channel slope, discharge(s), grain size, stream power.	Moderate if not extrapolated beyond calibration data	Applied within range of applicability with consideration of lateral vs. vertical susceptibility.

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ⁹
Mechanistic (M) / Empirical-Statistical (E/S) (Continued)								
Regression-based channel enlargement models	Hawley and Bledsoe, In Review	E/S	How much might the cross-sectional area of a channel increase in response to an increase in watershed impervious area, a peak discharge, or cumulative erosion potential?	reach to segment	Provide a prediction of channel response that can be used in probabilistic modeling, provide a second line of evidence on relative channel response along with regime diagrams.	Watershed, geomorphic and hydraulic characteristics – channel slope, discharge(s), grain size, stream power, cumulative erosion potential.	Moderate if not extrapolated beyond calibration data	Applied within range of applicability, supported with other lines of evidence? Erosion potential-based models more physically-based than impervious-based models.
Regime diagrams	Chang, 1988; Parker, 1990; Haines, In Preparation	M, E/S	What is the equilibrium slope, width, and depth of a channel given a dominant discharge and inflowing sediment load? If channel-forming discharge and inflowing sediment load are altered, what is the new equilibrium channel slope, width, and/or depth in absolute terms or relative to a current equilibrium condition?	reach to segment	Provide a second line of evidence on relative channel response along with empirical enlargement models, and assessing relative sensitivity to changes in water and sediment delivery.	Channel-forming discharge, inflowing sediment concentration / load, boundary conditions including grain size, flow resistance.	Moderate to High depending on regional calibration	Typically provide maximum response of one channel dimension while other dimensions are not allowed to mutually adjust, brackets maximum response in a relative senses. Applied within range of applicability? Channel-forming discharge is poorly defined in many instances – regime diagrams may not be appropriate in such situations.
Effective discharge calculators	GeoTools	M, E/S	What range(s) of streamflow transport have the most capacity to transport sediment and influence channel form over periods of years to decades? What is the change in cumulative erosion potential associated with a change in the continuous series of streamflows? What is the time-integrated capacity to transport sediment relative to the capacity of an upstream supply reach?	reach to segment	Can help identify channel-forming discharge required by many channel response predictors (e.g., stable channel design calculators). Integrate continuous flow simulations from rainfall-runoff models, hydraulic model outputs, sediment-transport calculations to provide outputs like erosion potential that often form the basis of probabilistic models (e.g., logistic	Continuous streamflow data (15-min preferred for small watersheds in southern California), channel hydraulic geometry, grain sizes.	Moderate if not extrapolated beyond calibration data	Input flow series should be at least 10 and preferably 20 to 30 yrs of 15-min data. USACE (Biedenharn <i>et al.</i> , 2000) provide standard procedures for bin selection and other decisions. Was appropriate sediment-transport relationship used (bedload vs. total load, range of calibration)? Were channel boundary materials accurately defined?

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ⁹
Mechanistic (M) / Empirical-Statistical (E/S) (Continued)					and quantile regression, neural networks, Bayesian networks) of channel response.			
Sediment-transport / shear stress calculators	GeoTools, HEC-RAS, BAGS (Bedload Assessment for Gravel-bed Streams), San Diego tool	M, E/S	What is the estimated sediment-transport capacity of a stream at some discharge(s) of interest?	reach to segment	Provide an independent check on sediment-transport calculations performed by other software packages.	Channel hydraulic geometry, grain sizes, bed slope (uniform flow) or energy slope (varied flow).	Moderate to High depending on selection of appropriate relationship for local conditions	Was appropriate sediment-transport relationship used (bedload vs. total load, range of calibration)? Were channel boundary materials accurately defined? Were shear stresses or other hydraulic inputs generated using appropriate methods (e.g., see HEC-RAS above)? If single-event discharges are used, how are the full spectrum of transport events accounted for?
Stable channel design calculators	HEC-RAS, SAM, iSURF	M, E/S	What is the equilibrium slope, width, and depth of a channel given a dominant discharge and inflowing sediment load (or upstream supply reach characteristics)? If channel-forming discharge and inflowing sediment load are altered, what is the new equilibrium channel slope, width, and/or depth in absolute terms or relative to a current equilibrium condition?	reach to segment	Another way of expressing a regime diagram and assessing relative sensitivity to changes in water and sediment delivery. Facilitates examination of possible mutual adjustments in width, depth, and slope.	Channel-forming discharge, inflowing sediment concentration / load, boundary conditions including grain size, flow resistance.	Moderate to High depending on selection of appropriate relationship for local conditions	Was appropriate sediment-transport relationship used (bedload vs. total load, range of calibration)? Were channel boundary materials accurately defined? Were hydraulic geometry relationships or other hydraulic inputs generated using appropriate methods (e.g., see HEC-RAS above). If single-event discharges are used, how are the full spectrum of transport events accounted for? Channel-forming discharge is poorly defined in many instances - may not be appropriate in such situations.

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ^s
Mechanistic (M) / Empirical-Statistical (E/S) (Continued)								
Bank stability charts – regression of regional field data	Bledsoe <i>et al.</i> , 2012	E/S	Does this stream reach have banks that are close to a threshold of failure given its height and angle?	reach to segment	Can be embedded in susceptibility screening tools, quantitative channel evolution models, and regime diagrams. A much simplified empirical version of highly-detailed, mechanistic approaches like Bank Stability and Toe Erosion Model (BSTEM).	Field visit, bank height/angle, expertise in fluvial geomorphology.	Moderate to High depending on selection of appropriate relationship for local conditions	Requires consistency and expertise in fluvial geomorphology for adequate accuracy. Applied within range of applicability with consideration of lateral vs. vertical susceptibility.
Sediment budgeting tools	HEC-RAS - SIAM, Reid and Dunne, 1996		Given knowledge of streamflows and inflowing sediment loads, how do annualized sediment reach transport capacities compare to supplies? What are the locations of reaches of overall sediment surplus or deficit?		Can provide a network perspective on sediment imbalances that segment-scale approaches and mobile boundary models cannot. Does not translate changes into channel morphologic change like regime diagrams, stable channel design calculators and mobile boundary models.	Channel and structure geometry, flow resistance values, boundary conditions, and other parameters, flow-duration curves, sediment-supply data – source type (gully, surface, bank, U/S, and other), rate (tons/yr) and gradation.	High	Very difficult to define boundary conditions / inflowing sediment loads in southern California.
Bank stability / toe erosion models	USDA – BSTEM	M, E/S	How stable is this bank given its profile, stratigraphy, root reinforcement, drainage, scour, etc.?	sub-reach	Provides site-specific, physically-rigorous basis for predicting bank failures but more data and resource intensive than simplified field assessments.	Extensive parameterization required, e.g., geometric data, geotechnical properties, plant root properties, etc.	Moderate to High depending on availability of numerous input parameters	Meeting extensive input data requirements will rarely be feasible for hydromodification management.

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use ⁵
Mechanistic (M) / Empirical-Statistical (E/S) (Continued)								
Mobile boundary models	HEC-RAS, HEC-6T, CONCEPTS, FLUVIAL12	M, E/S	What degree of aggradation, degradation, and change in channel form is expected along this stream reach?	reach to segment	Provide greatest resolution in morphologic change at the expense of complexity and difficult parameterization.	Extensive parameterization required, e.g., geometric data, sediment gradation and channel boundary conditions, flow resistance, inflowing sediment loads, etc.	Very High	Generally not applicable to southern California streams given high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and bed-armoring processes.
Probabilistic (P) Models								
Logistic regression models of channel instability and enlargement	Palhegyi and Bicknell, 2004; Hawley and Bledsoe, In Review	P	What is the probability of channel instability (or some other undesirable state) given some change in streamflow / sediment-transport characteristics (e.g., erosion potential)? What is the probability of some level of channel enlargement given some increase in imperviousness or erosion potential without mitigation? What is the uncertainty in a prediction of instability, enlargement of some other impact?	reach to segment	Integrates several of the models above (hydrologic, hydraulic, sediment transport) to predict likelihood of channel response based on process-based metrics that control erosion potential. More familiar and easier to understand than neural networks or Bayesian approaches.	Metric(s) of hydromodification impact and context (e.g., erosion potential) typically based on combination of channel geometry, continuous flow series, and channel boundary conditions (bed and bank materials).	Explicitly known, typically moderate with appropriate data	Perhaps most appropriate balance of physical detail and simplicity in application currently available. Several of the models described above supply input information; therefore, all the considerations and questions associated with those models apply to these integrative tools as well. Standard statistical diagnostics should be performed.

Tools / Models	Example(s)	Type	Question(s) Addressed	Scale	Relation to Other Tools	Data Requirements	Relative Uncertainty	Key Considerations / Questions in Appropriate Use [§]
Probabilistic (P) Models (Continued)								
Neural network models of channel enlargement	Sengupta <i>et al.</i> , In Review	P	What is the probability of some level of channel enlargement given some increase in imperviousness or erosion potential without mitigation? What is the uncertainty in a prediction of instability, enlargement of some other impact?	reach to segment	Integrates several of the models above (hydrologic, hydraulic, sediment transport) to predict likelihood of channel response based on process-based metrics that control erosion potential. Can handle many types of input data and complex interactions and non-linear responses.	Metric(s) of hydromodification impact and context (e.g., erosion potential) typically based on combination of channel geometry, continuous flow series, and channel boundary conditions (bed and bank materials).	Explicitly known, typically moderate with appropriate data	Appropriate balance of physical detail and simplicity in application currently available. Several of the models described above supply input information; therefore, all the considerations and questions associated with those models apply to these integrative tools as well. Somewhat more difficult to interpret than more familiar models like logistic regression.
Bayesian networks	Borsuk <i>et al.</i> , 2004; Stewart-Koster <i>et al.</i> , 2010; Shultz <i>et al.</i> , 2011	P	What is the probability of channel instability (or some other undesirable state) given some change in streamflow / sediment-transport characteristics (e.g., erosion potential)? What is the probability of some level of channel enlargement given some increase in imperviousness or erosion potential without mitigation? What is the uncertainty in a prediction of instability, enlargement of some other impact?	reach to segment	Integrates several of the models above (hydrologic, hydraulic, sediment transport) to predict likelihood of channel response based on process-based metrics that control erosion potential. Combines many types of data and models along with expert judgment into a unified probabilistic framework. Prediction uncertainty is clearly expressed in outputs.	Metric(s) of hydromodification impact (e.g., erosion potential) typically based on combination of channel geometry, continuous flow series, and channel boundary conditions (bed and bank materials), can readily incorporate data from mechanistic models, categorical data, and expert judgment.	Explicitly known, typically moderate with appropriate data	Appropriate balance of physical detail and simplicity in application currently available. Several of the models described above supply input information; therefore, all the considerations and questions associated with those models apply to these integrative tools as well. Somewhat more difficult to interpret than more familiar models like logistic regression. Prior probabilities should be non-informative without clearly documented evidence from literature or formal elicitation process.

[§] Key considerations that control precision and accuracy for all models: 1) model structure, detail, resolution, and boundaries; and 2) calibration, validation, and extrapolation.

Managers must also attempt to ensure that the level of analysis of potential hydromodification impacts is commensurate with the risks associated with a particular decision. Rapid geomorphic assessments and screening tools like the one developed by SCCWRP and CSU assess the relative susceptibility of channels to hydromodification. Susceptibility is described in terms of lateral change (bank erosion, widening, shift to braiding) and vertical change (incision and enlargement) based on several physically-based risk factors. It follows that the risk factors leading to a particular susceptibility rating can inform the selection of additional models that can be used to perform a more rigorous assessment of susceptibility. Table 4 illustrates some hypothetical relationships between different combinations of lateral and vertical susceptibility ratings and models that are relevant to more in-depth modeling and analysis of potential channel response to hydromodification. It is important to recognize that the same susceptibility rating can result from different risk factors. For example, one channel may be rated high for lateral susceptibility due to proximity to a braiding threshold and another channel may be rated high due to unconsolidated materials in the bank toe. Thus, the screening ratings do not map directly to a specific set of models that are appropriate for a more in-depth analysis. Instead, it is recommended that managers focus on the risk factors (e.g., proximity to critical bank height and angle) that result in a particular rating and to choose supporting models that provide more resolution in understanding the processes associated with those specific risk factors. It is important to note that we are not including single-event hydrologic modeling in Table 4 because: 1) single-event modeling does not provide critical information on how altered flow frequencies and durations affect cumulative sediment transport capacity, and 2) the highly significant influence of time-integrated erosion potential in the statistical models focused on channel enlargement and instability as described above suggests that single event modeling does not produce sufficiently reliable predictions of future conditions.

Table 4. Matrix illustrating combinations of geomorphic modeling tools for each combination of V and L ratings.

Vertical (V) Rating	H	1,2,4,6,7,8	1,2, ,4,5,6,7,8,9	1,2,3,4,5,6,7,8,9,10,11
	M	1,2,4,6,7,8	1,2, ,4,5,6,7,8	1,2,4,5,6,7,8,9,10
	L	1,2,3	1,2,3,5	1,2,3,5,9,10
		L	M	H
Lateral (L) Rating				

L Low
M Medium
H High

1. Continuous hydrologic simulation
2. Regional regressions – hydrology
3. Shear stress threshold modeling bed and/or bank
4. Detailed incision threshold models
5. Detailed braiding threshold models
6. Regime diagrams / Copeland method in HEC-RAS
7. Channel enlargement models
8. Erosion potential / CSR with continuous simulation
- 9..Bank stability models – Osman / Thorne, BSTEM, RootRIP, Iowa bore hole
10. Jet testing
11. Sediment Impact and Assessment Model – SIAM in HEC-RAS

2.4 Combining Tools for Hydromodification Management

This section provides a discussion of four example “suites of tools” that can be used to perform predictive scientific assessments and address specific questions related to hydromodification assessment and management. The suites are changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment that incorporates a number of the tools discussed above, combined in various ways. For example, some suites apply a series of cascading models, in which the output from one is used as input to the next; other suites apply a number of models in parallel to develop an assessment based on the weight of evidence. The suites of tools discussed below are used to perform a baseline stability assessment, a channel-forming discharge analysis, an erosion potential analysis, and a sediment-transport analysis. Most of these standard tools (with the exception of the erosion potential suite) have been widely employed in a variety of stream management activities for decades, and are considered essential components of the broader fluvial geomorphology toolbox. This is far from a comprehensive list of tools, as there are many other important tools (focused on both geomorphic and biologic endpoints) relevant to hydromodification management (Kondolf and Piégay, 2003; Poff *et al.*, 2010); however, the purpose of this section is to briefly illustrate how several standard tools can be integrated to answer key questions about stream responses and to provide a stronger technical basis for hydromodification management.

Application of these tools provides basic geomorphic data and knowledge that are typically needed to manage a stream for some desired future state in a watershed with changing land uses. This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis. Stormwater management programs typically have made the “practical” assumptions that stream reaches can be managed in isolation from the larger systems of which they are a part, and that effective management prescriptions can be formulated with little or no substantive geomorphic analysis. These assumptions are in direct conflict with current understanding in fluvial geomorphology and stream ecology, which indicates that protection of stream integrity is often predicated upon careful assessments of geologic and historical context, performing detailed hydraulic and sedimentation analyses where appropriate, and developing basic understanding of streamflow-ecology linkages. If hydromodification management policies are to have a reasonable chance of actually achieving their aims, then it will most likely be necessary to reject these simplifying assumptions and instead rely on approaches rooted in current scientific understanding of stream systems.

“This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis.”

The suites of tools described below go beyond screening-level assessments that are designed, in part, to identify which streams lend themselves to relatively-straightforward management prescriptions vs. the streams that do not. For streams that do not lend themselves to generic management prescriptions, the

level of analysis performed with these tools should increase with the level of risk and geomorphic / biologic susceptibility of the streams. This does not mean that every stream will require in-depth analysis by local permitting agencies. It is not possible to carry out sufficient geomorphic analyses with the tools illustrated below on a permit-by-permit basis, and local governments may lack the resources and/or technical capacity to effectively apply these tools. Instead, the vital information provided by these tools will need to be obtained through proactive regional studies that involve watershed-scale baseline assessments followed by progressively more in-depth analyses as necessary to provide local governments with a sound basis for effective project-by-project decision-making within a broader watershed management framework.

1. **Baseline Stability Assessment.** This suite of tools is designed to answer the following key questions:

- What is the trajectory of the stream's form over time?
- How has the channel form responded to changes in water and sediment supply over the years?
- Is the channel close to a geomorphic threshold that could result in rapid, significant change in response to only minor flow alteration?
- How can past channel responses provide insight into potential responses to future watershed change, and so aid in prediction of future hydromodification-induced changes?
- What level of subsequent geomorphic analysis is appropriate given the complexity of the situation and the susceptibility of the streams of interest?

The goals of a baseline stability assessment are to:

- Document the historical trends of the system;
- Establish the present stability status of the system and identify the dominant processes and features within the system;
- Provide the foundation for projecting future trends with and without proposed project features;
- Provide critical data for calibration and proper interpretation of models; and
- Provide a rational basis for identification and design of effective alternatives to meet project goals.

The key tools that comprise this suite include:

- GIS mapping of topography, soils, geology, land use / land cover across the contributing watershed (e.g., Thorne, 2002);
- Analysis of hydro-climatic data, e.g., streamflow gage records, changes in stage-discharge relationships over time (e.g., Thorne, 2002);
- Analysis of aerial photographs and historical data (e.g., Thorne, 2002);
- Field reconnaissance (e.g., Thorne, 1998);
- Qualitative response (e.g., Lane, 1955b; Schumm, 1969; and Henderson, 1966 relations)
- Classification systems (e.g., Thorne (1997); Schumm (1977); and CEM developed for southern California by Hawley *et al.*, 2012);
- Relationships between sediment transport and hydraulic variables;
- Regional hydraulic geometry (e.g., Hawley, 2009) and Haines, In Preparation);

- Regional planform and stability predictors (e.g., Hawley *et al.*, 2012; Bledsoe *et al.*, 2012; and Dust and Wohl, 2010);
- Bank stability analysis (e.g., BSTEM <http://www.ars.usda.gov/Research/docs.htm?docid=5044>, Hawley, 2009); Bledsoe *et al.*, In Press; Osman and Thorne, 1988; and Thorne *et al.*, 1998);
- Sediment budgets (Booth *et al.*, 2010; Reid and Dunne, 1996); and
- Fluvial audit (Thorne, 2002) – a comprehensive framework for performing baseline assessments).

A baseline assessment is completed by integrating information from all the available data sources and analytical tools. Analysis with each of the individual tools may yield a verdict of aggradation, degradation, or dynamic equilibrium with respect to the channel bed, and stable or unstable with respect to the banks. The individual assessments can produce contradictory results. In this case, one should assign a level of confidence to the various components based on the reliability and availability of the data, and the analyst's own experience level. As is often the case in the management of fluvial systems, there is no "cookbook" answer, and we must always incorporate sound judgment.

2. **Channel-forming discharge suite of tools.** This suite of tools is designed to answer the following key questions:

- What ranges of discharges are most influential in controlling channel form and processes over decadal time scales?
- What channel-forming discharges should be used in sediment-transport analyses to identify sediment-transport capacity, equilibrium slope and geometry, etc.?

The tools that comprise this suite include the following:

- Effective discharge computations (e.g., Soar and Thorne, 2001); Biedenharn *et al.*, 2000; GeoTools – Bledsoe *et al.*, 2007) – an effective discharge analysis directly quantifies the range of discharges that transport the largest portion of the annual sediment yield over a period of many years;
- Field identification of high water elevations, depositional surfaces, and "bankfull" features;
- Flood frequency analysis; and
- Un-gaged site analysis (e.g., USGS StreamStats, <http://water.usgs.gov/osw/streamstats/california.html>); Hawley and Bledsoe, 2011, regional flow-duration curve extrapolation – Biedenharn *et al.*, 2000).

This suite incorporates a number of parallel analyses that can be used to establish likely upper and lower bounds to the range of influential discharges, and that can be assessed through a weight-of-evidence evaluation. Figure 17 is an example output from the channel-forming discharge suite of tools.

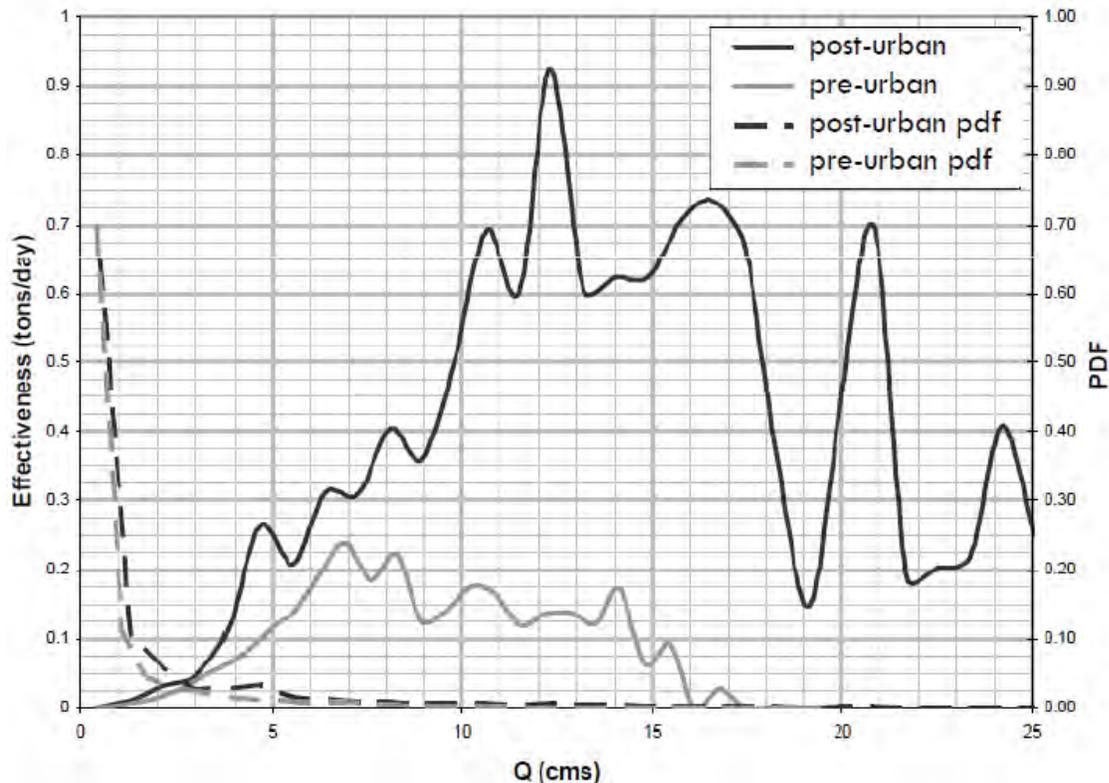


Figure 17. Flow effectiveness curves for continuous series of pre-urban and post-urban discharges (Biedenharn *et al.*, 2000; Bledsoe *et al.*, 2007). Cumulative sediment yield is approximated by the area under the respective curves. If the stream bed is the most erodible channel boundary, the ratio of areas under these curves would be the erosion potential metric described below in the next suite of tools.

3. **Erosion potential suite of tools.** This suite of tools is designed to answer the following key questions:
- How do proposed land use changes or channel alteration affect the capacity of a channel to transport the *most erodible material in its boundary* over a period of many years (erosion potential – E_p)?
 - Do proposed mitigation approaches match the pre- vs. post-development erosion potential over the full spectrum of erosive flows?
 - Do past changes in erosion potential correspond to different states of channel stability and degradation in this region?
 - Does a proposed change in streamflow make it more likely that a channel will enter an alternative / degraded state?

The underlying premise of the erosion potential approach advances the concept of flow-duration control (discussed in Chapters 2 and 3 of Technical Report #667 *Hydromodification Assessment and Management in California* (Stein *et al.*, 2012)) by addressing in-stream processes related to sediment transport. An erosion potential calculation combines flow parameters with stream geometry to assess long-term (decadal) changes in the sediment-transport capacity. The cumulative distribution of shear

stress, specific stream power, and sediment-transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric, E_p (e.g., Bledsoe, 2002). This erosion potential metric is a simple ratio of post- vs. pre-development sediment-transport capacity over a period of many years. The calculated capacity to transport sediment can be based on the channel bed material or the bank material, depending on which one is more erodible.

This E_p suite of tools has been applied in two primary ways:

1. At a project-level analysis, it has been applied to answer the first two questions above. A municipal stormwater permit may require a project design to achieve an erosion potential (E_p) value of 1.0. This means that a project must be designed so that the long-term erosion potential of the site's stormwater discharge is equal to the erosion potential of the pre-development condition. Item 3.1 below explains the process by which this analysis is conducted.
2. At a regional level, this suite of tools can be applied to answer the third and fourth questions above and to provide further guidance to project-level assessments. For example, practical engineering considerations generally require that a tolerance be permitted around a target design value. It is unlikely that a project design can match an E_p target of 1.0 across all conditions and through all stream reaches, due to variations in a multitude of contributing factors. The selection of an acceptable tolerance or variance from 1.0 is a management decision that should be informed by regional data presented in a risk-based format. Item 3.2 below explains how such a study has been conducted, using the Santa Clara Valley example from northern California.

2.4.1 *Project-level Analysis.*

As applied to the analysis of project impacts and mitigation design, the steps and associated tools that comprise this suite include the following (Figure 18):

- Perform continuous simulation of hydrology (e.g., SWMM, HEC-HMS, HSPF) for the project site, for both pre-project condition and post-project condition with the proposed mitigation design.
- Convert discharges and field surveys to hydraulic parameters (shear stress and specific stream power) – e.g., for uniform flow analysis use Manning's equation, GeoTools; for varied flow analysis use HEC-RAS.
- Convert hydraulic parameters into sediment-transport capacity – e.g., at-a-station hydraulic geometry, HEC-RAS, GeoTools, sediment-transport relationships (bedload and total load).
- Integrate E_p over time – e.g., GeoToolsCompare E_p values for pre-development and post-development to determine if the proposed mitigation design is adequate. Adjust stormwater controls as necessary to meet target E_p .

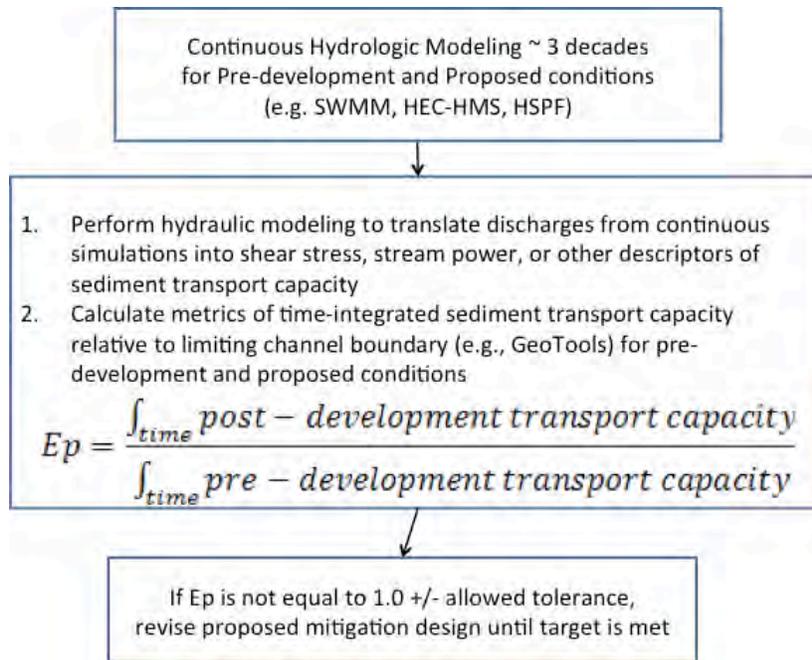


Figure 18. Steps involved in a project-level erosion potential analysis.

2.4.2 Risk-based Regional Analysis.

Risk-based modeling estimates the probability of stream geomorphic states. Decision-makers can then choose acceptable risk levels based on an explicit estimate of prediction error. The foundation of risk-based modeling in the context of hydromodification management is the integration of hydrologic and geomorphic data derived from the output of continuous hydrologic simulation models to generate metrics describing expected departures in the most important stream processes. These physical metrics are provided as inputs to probabilistic models that estimate the risk of streams shifting to some undesirable state. Because the decision endpoint is often categorical (e.g., stable, good habitat) the statistical tools of choice are often logistic regression, classification and regression trees (CART), and/or Bayesian probability networks.

The steps below are used to develop a risk-based framework (Figure 19) for assessing how hydromodification may impact streams within a region, and for understanding the relationships between E_p and the likelihood of channel instability. Both Figure 15 described above and the probabilistic approach that was used in the development of the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (<http://www.SCVURPPP.org>) demonstrate that a time-integrated index of erosion potential based on continuous hydrologic simulation and an assessment of stream power relative to the erodibility of channel boundary materials can be used to distinguish between channels of a particular regional type that are stable vs. degraded by hydromodification in urban watersheds. For example, as erosion potential increases from 0.7 to 1.5, the risk of channel instability (vertical axis) increases nonlinearly (Figure 15). The overall steps include:

- Perform project-level analysis as described above for existing developments throughout the study watersheds.
- Perform stream surveys throughout the study watersheds to characterize condition (i.e., stable, unstable).
- Create statistical relationships between E_p and different channel states – e.g., logistic regression in R, SAS, Statistica, Minitab, etc. Note that standard regression techniques are applied when the dependent variable and the explanatory variables are quantitative and continuous. To analyze a binary qualitative variable (e.g., 0 or 1, stable or unstable, healthy or degraded) as a function of a number of explanatory variables, alternative techniques must be used. The regression problem may be revised so that, rather than predicting a binary variable, the regression model predicts a continuous probability of the binary variable that stays within 0–1 bounds. One of the most common regression models that accomplishes this is the logit or logistic regression model (Menard, 1995; Christensen, 1997).

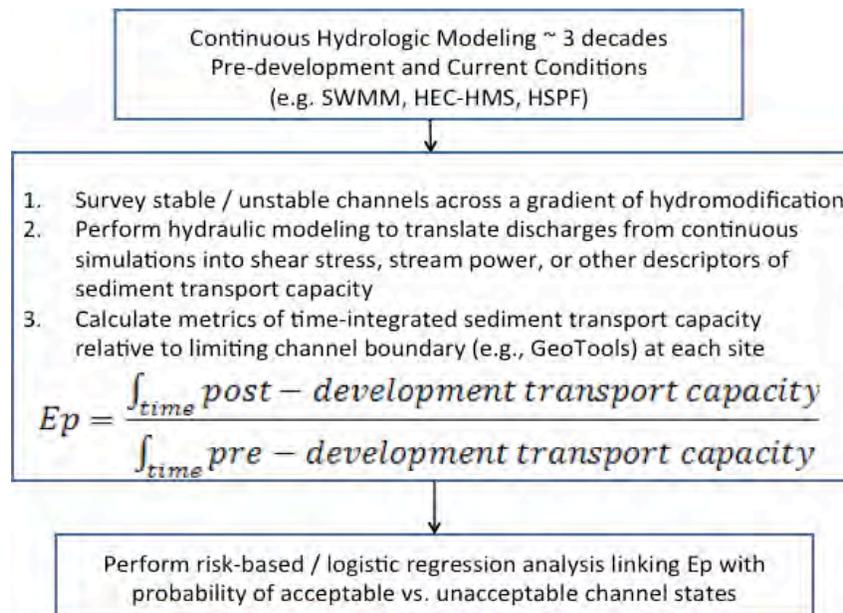


Figure 19. Steps involved in a risk-based erosion potential analysis.

The variables included in risk-based models of stream response are not limited to erosion potential. Additional multi-scale controls could be included. For example, simple categories of physical habitat condition and ecological integrity could be predicted by augmenting erosion potential metrics with descriptors of the condition of channel banks and riparian zones, geologic influences, floodplain connectedness, hydrologic metrics describing flashiness, proximity to known thresholds of planform change, and BMP types. Furthermore, although most of the emphasis to date has been on predicting geomorphic endpoints, the risk-based approach can be extended to the prediction of biological states in urban streams if the necessary data are available.

2.4.3 Strengths and Limitations

The erosion potential approach combines a sound physical basis with probabilistic outputs and requires a substantial modeling effort. Such an effort is necessary to adequately characterize the effects of hydromodification on the stability of streams that are not armored with very coarse material such as large cobbles and boulders. Although policies based on this approach should reduce impacts to channel morphology, they may still fail to protect stream functions and biota. Key simplifying assumptions and prediction uncertainty in the inputs (hydrologic modeling, assumptions of static channel geometry in developing long-term series of shear stresses or stream powers, critical assumptions of stationarity in sediment supply, etc.) have not been rigorously addressed. Its effectiveness also depends on careful stratification of streams in a region such that fundamentally-different stream types are not lumped together (e.g., labile sand channels vs. armored threshold channels with grade control) in developing general relationships for instability risk. Endpoints to date have been rather coarse, e.g., stable vs. unstable; as such, they do not provide a desirable level of resolution for envisioning future stream states. Nevertheless, the erosion potential approach is an important tool in the hydromodification management toolbox. It is recommended that this approach be refined to address sediment-supply changes and to provide more finely resolved endpoints for improved predictive capabilities and management utility.

2.4.4 Sediment-transport Analysis Suite of Tools

This suite of tools is designed to answer the following questions:

- Do I need to incorporate sediment-transport analysis in predicting channel response to hydromodification, i.e., what is the sensitivity of channel slope and geometry to inflowing sediment load?
- At what discharges are different fractions of bed material mobilized in a particular stream segment?
- What is inflowing sediment load to a stream segment, i.e., what is the water discharge $Q(t)$ and sediment-supply rate $Q_s(t)$, and grain size $D(t)$ delivered to the upstream end of the channel segment of interest?
- How will the available flow move the supplied sediment through the segment of interest?
- What is the new equilibrium slope given some change in streamflow, and how much incision would be necessary to achieve this new slope?
- What is the sediment-transport capacity of the segment of interest *relative to* the inflowing sediment load from *upstream* supply reaches?
- What is the sediment-transport capacity of the segment of interest *relative to* the capacity of *downstream* reaches?
- At the network scale, where are zones of low vs. high energy, aggradation vs. degradation potential, and coarse sediment constriction located?

The primary tools that comprise this suite include the following:

- Tools for estimating watershed sediment supply (Reid and Dunne, 1996), including the RUSLE (Renard *et al.*, 1997); <http://www.ars.usda.gov/Research/docs.htm?docid=5971> and WEPP (Laflen *et al.*, 1991); <http://www.ars.usda.gov/Research/docs.htm?docid=10621> models;
- Effective discharge analysis (see above);
- Incipient motion analysis (tractive force, e.g., ASCE, 2008; Brown and Caldwell, 2011; Buffington and Montgomery, 1997; and Lane, 1955a);
- Regime diagrams that provide relative and absolute predictions of channel dimensions and slope in response to altered discharges of water and sediment (this project)
- Sediment continuity analysis at single dominant discharge with an appropriate sediment-transport relation – e.g., HEC-RAS, Bedload Assessment for Gravel-bed Streams (BAGS – Pitlick *et al.*, 2009); GeoTools);
- Equilibrium slope / geometry analysis, e.g., HEC-RAS – Copeland *et al.* (2001) and iSURF – National Center for Earth-Surface Dynamics (NCED, 2011);
- Sensitivity to inflowing sediment load analysis, e.g., Copeland’s method in HEC-RAS and iSURF – NCED (2011);
- Sediment continuity analysis over the entire flow frequency distribution, e.g., Capacity-Supply Ratio of Soar and Thorne (2001), BAGS, GeoTools; and
- Network-scale sediment balance – Sediment Impact Analysis Methods (SIAM) module in HEC-RAS.

Figures 20 and 21 depict example outputs from an application of the sediment-transport suite of tools.

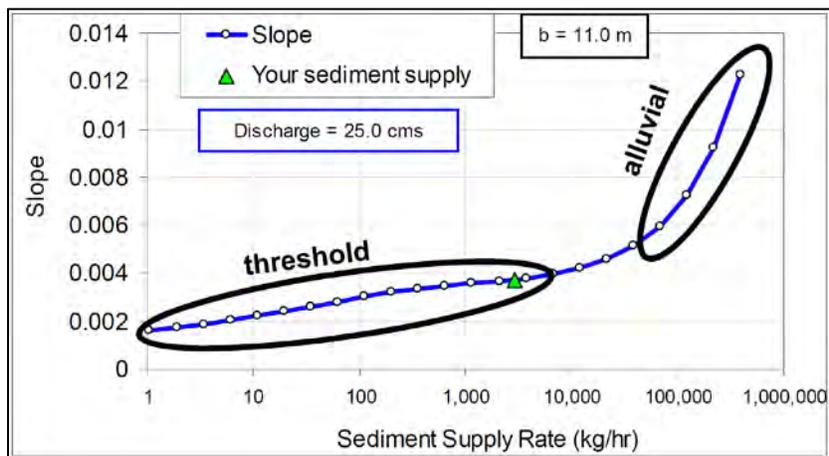


Figure 20. Sensitivity analysis of equilibrium channel slope to inflowing sediment load (from iSURF (NCED, 2011)). Slopes of alluvial channels with high sediment supply are much more sensitive than threshold channels with relatively low sediment supply. Channels with beds composed of sand and fine gravels are generally much more geomorphically sensitive to hydromodification than threshold channels in which coarse-bed sediments are primarily transported at relatively high flows. In the case of the green triangle, this analysis indicates that the slope of the channel in question is relatively insensitive to changes in inflowing sediment load compared to more labile alluvial channels that are adjusted to high sediment supplies.

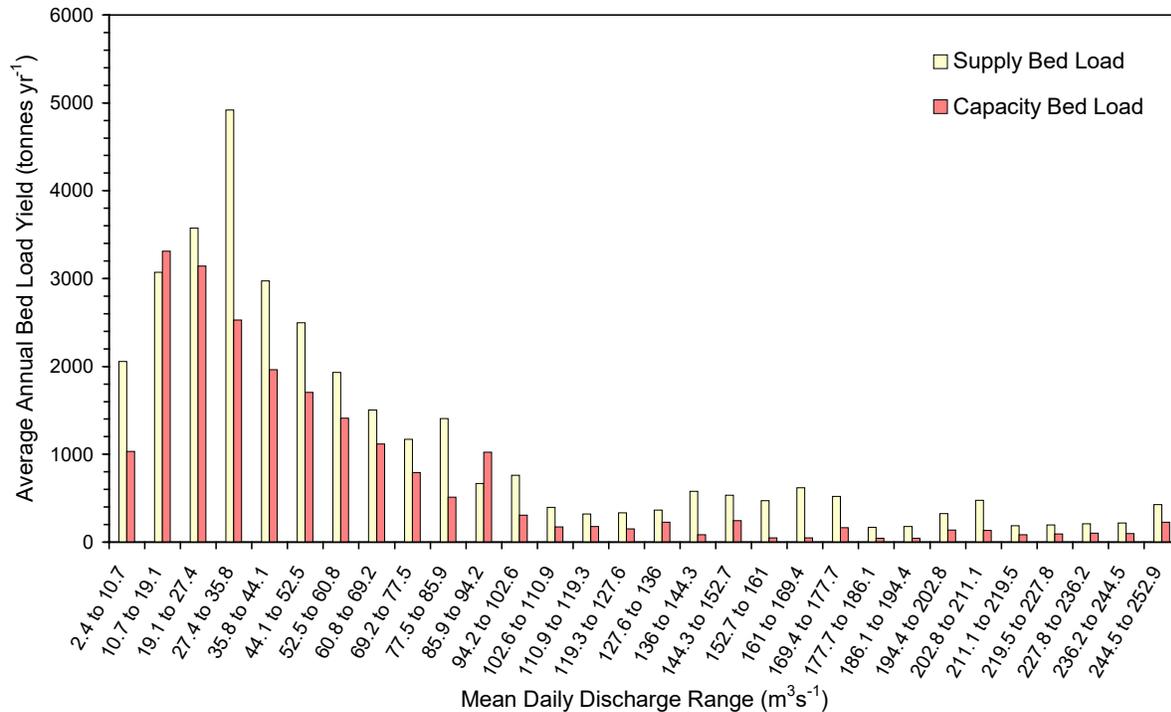


Figure 21. Analysis of sediment-transport capacity vs. inflowing sediment load over the full spectrum of stream discharges (capacity-supply ratio; Soar and Thorne (2001)). In this case, the time-integrated capacity to transport bedload is 64% of the supplied bedload and significant aggradation is expected.

2.4.5 Relationship to Management Framework

These suites of tools could be applied to establish project-specific requirements for hydromodification assessment and mitigation. In the example shown in the diagram below (Figure 22), results of the Baseline Assessment are used to assign risk levels for stream reaches, in conjunction with the proposed land use changes. Thus, the Baseline Assessment suite of tools is used in determining whether a detailed survey-level assessment and additional suites of tools are necessary for an adequate analysis. The need to apply additional suites of tools in formulating a management approach is commensurate with the level of risk and susceptibility of the stream. More complex and rigorous analysis with multiple suites of tools is necessary in predictive assessments for relatively susceptible stream types such as alluvial channels with sand beds.

Although a stream may have relatively low susceptibility for overall geomorphic change, it may nevertheless have ecological attributes that are highly susceptible to hydromodification. Thus, suites of tools (Figure 22) focused on both geomorphic and biological endpoints should be used to fully assess stream susceptibility to hydromodification. More work will be required to develop tools for prediction of biological response to flow alterations throughout California (see Poff *et al.*, 2010) and <http://conserveonline.org/workspaces/eloha>).

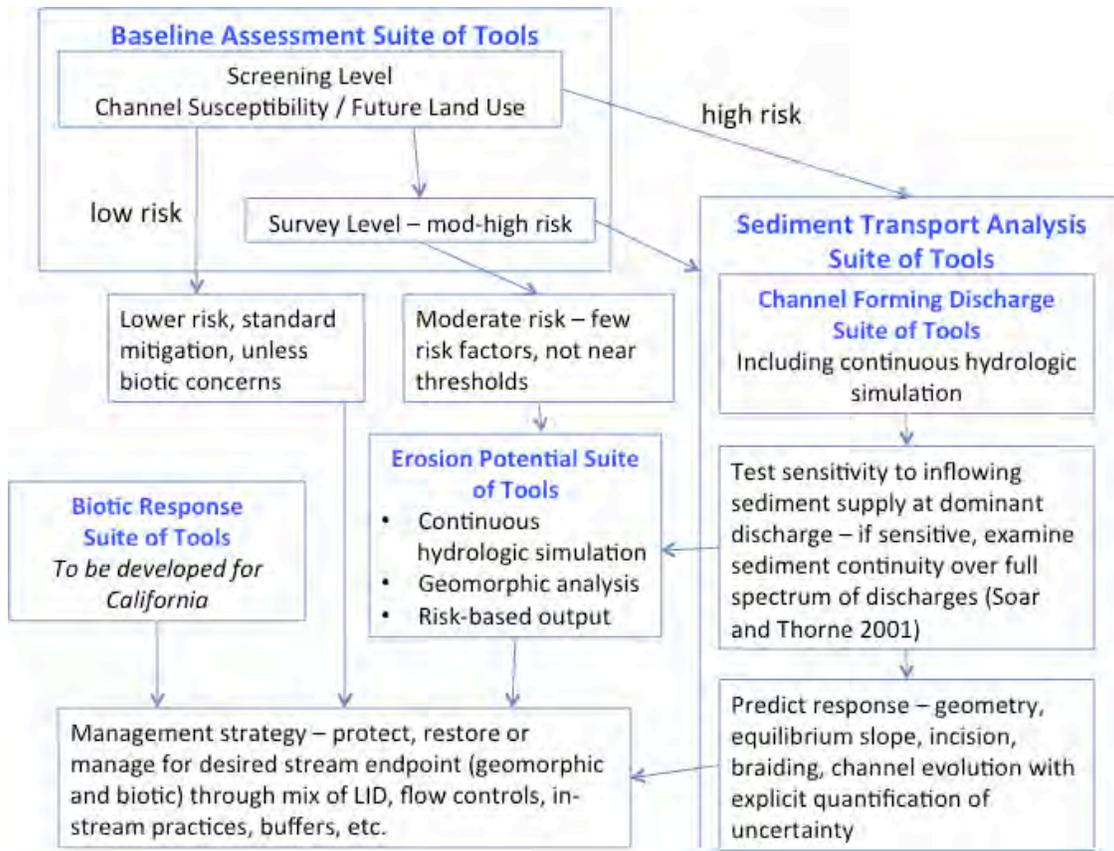


Figure 22. Conceptual diagram showing relationships among the four suites of existing tools and biotic response tools to be developed in the future. Additional analyses will be required for engineering design.

2.5 Available Tools Conclusions

This project has developed several new modeling tools to support hydromodification management in southern California, including hydrologic tools for prediction in ungauged basins, analytical regime diagrams, channel enlargement models based on regression and ANNs, and an updated version of the GeoTools package.

These tools, in combination with existing tools, have the potential to advance hydromodification management by:

- Providing a physical basis for making predictions of stream response to watershed development.
- Assessing alternative future states of streams under different management scenarios.
- Avoiding one-size-fits-all solutions through:
 - improved prediction of relative magnitude of potential channel change and proximity to response thresholds; and
 - tailoring mitigation strategies to streams with different levels of susceptibility.

Statistical models developed in this study indicate that channel enlargement is highly dependent on the ratio of post- to pre-urban sediment-transport capacity over cumulative duration simulations of 25 years (load ratio, a.k.a. erosion potential), which explained nearly 60% of the variance in channel response. Neural network models developed in this study indicated that estimated increases in Q_2 based on regional flood regression equations (Hawley and Bledsoe, 2011) consistently ranked as the most important predictor of channel enlargement despite the inclusion of a large pool of watershed and geomorphic descriptors at various spatial scales. Thus, the enlargement models point to the importance of balancing the post-development sediment transport to the pre-development setting over an entire range of flows rather than a single flow in order to reduce the risk of adverse channel responses to hydromodification.

We also evaluated the potential applicability of various movable bed and/or boundary models to predicting channel response to hydromodification in southern California. These tests indicated that mobile boundary hydraulic models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and bed-armoring processes.

The tools developed in this project have a clear physical basis; however, their efficacy for predicting the effects of hydromodification has not been demonstrated. As such, there is a pressing need for monitoring data to test and improve models. There is also an ongoing need to better define predictive scientific assessments (changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment) that are most appropriate for answering hydromodification management questions. The mechanistic models included in such assessments should account for hydraulic characteristics through physically-based metrics like load ratio / erosion potential, as opposed to arbitrary thresholds of discharge. By converting discharge values into hydraulic variables (common choices are shear stress or stream power per unit area of channel relative to bed sediment size), a “common currency” for managing erosion and associated effects can be established and applied across many streams in a region. Assessments of potential stream responses to management decisions should also account for the dominant watershed processes and features within the broader system that constrain future geomorphic potential (and although not emphasized in this study, ecological potential). This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis.

Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high. Probabilistic modeling of urbanizing streams provides a more scientifically-defensible alternative to standardization of stormwater controls across all stream types, and can inform management decisions about acceptable levels of risk. Explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. Thus, there is a need to develop probabilistic modeling approaches that can be updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical

models based on field surveys of stream characteristics, and expert judgment. Although valuable, deterministic representations (such as those derived from continuous simulation modeling) of processes and responses can mask uncertainties and be misleadingly precise unless prediction uncertainty is explicitly characterized. Ultimately, the focus of scientific study in support of decision-making should be on the decisions (or objectives) associated with the resource and not on building more-detailed models with the hope that they will provide the answers that elude us.

The uncertainty inherent to hydromodification modeling also underscores the need for carefully designed monitoring and adaptive management programs. Emphasis should be placed on building an empirical basis for these tools through effective monitoring.

3.0 DECISION-MAKING APPROACH

Managing effects of hydromodification is the culmination of all preceding analysis (Figure 23). It entails efforts to remedy existing/past impacts as well as prevent or minimize the potential for future impacts. Hydromodification results from a complex set of processes over long-periods of time; therefore, a suite of management approaches will often be necessary to address the effects. The ultimate management prescription should also account for existing and future constraints in the watershed that may limit the ability to apply certain approaches (e.g., existing development and channelization). As with all other sets of technical recommendations, the guidelines and recommendations provided below are intended to provide resources to guide location-specific decisions rather than prescriptive approaches to be universally applied in all situations.

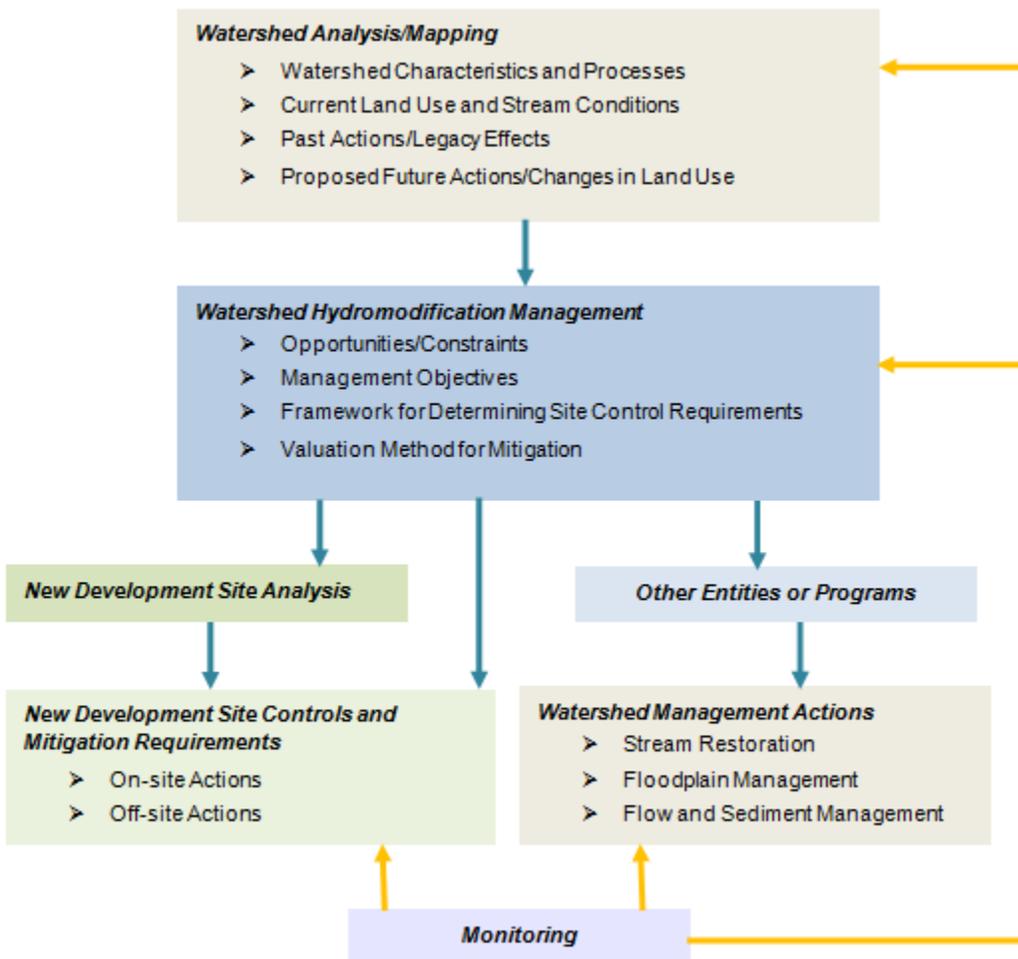


Figure 23. Framework for integrated hydromodification management

3.1 General Guidelines for Hydromodification Management

Hydromodification management plans should be developed around the following general principles:

- Hydromodification management needs to occur primarily at the watershed scale. The foundation of any hydromodification management approach should be an analysis of existing and proposed future land uses and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.
- Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided.
- An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.
- Hydromodification control measures cannot be driven solely by new development and redevelopment, legacy effects should be remedied in order to restore watershed processes. This also means that management strategies will need to acknowledge pre-existing impacts associated with historical land uses. Restoration goals should be set in the context of existing and anticipated future constraints. This will allow for development of a reasonable set of expectations and restoration targets.
- Management measures should be informed and adapted based on monitoring data. Similarly, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management measures, such that measures that prove effective can be emphasized in the future (and those that prove ineffective can be redirected).
- Hydromodification potentially affects all downstream receiving waters. For example, bays, harbors, and estuaries may be affected by excessive sediment input. These waterbody types should be considered in the development of hydromodification management plans and accounted for when developing watershed goals and objectives.

In many cases, relying solely on site-based flow control will not be wholly effective at addressing all hydromodification effects, particularly those associated with effects of past land-use practices. Management approaches should shift from a stream centered view of controlling erosion, deposition, and planform change to focus on restoring watershed processes that ensure movement of water and sediment in ways that help maintain the dynamic equilibrium of stream channels:

- Coarse sediment-supply areas should be protected and restored – Coarse sediments, such as larger sands, gravels, and cobbles can erode from hillslopes around streams via a variety of processes including dry ravel, erosion, and via overland runoff. Once in the stream, coarse materials play a substantial role at maintaining equilibrium of work within the channel and

reducing the erosive energy of flow on channel bed and banks. Maintaining these supplies is critical to long-term dynamic stability of stream channels.

- Coupling between sediment supply and transport reaches should be maintained or restored – Land use practices, such as housing, roads, and basins often intentionally or unintentionally disrupt or intercept the movement of sediment from hillslopes to floodplains and channels. For coarse sediment to be effective at helping to protect streams from hydromodification, the connection (or coupling) between hillslopes and floodplains must be maintained (or restored).
- Sediment-transport capacity should be maintained – Functioning stream systems facilitate movement of sediment from source areas to downstream areas of deposition that support habitat and encourage channel processes that reduce energy (e.g., meandering, multi-thread flow). The transport function of reaches that typically occur in the middle portions of watersheds should be maintained, managed, and restored (if necessary).
- Floodplain connections should be protected and restored – Floodplains perform a range of hydrologic and ecological functions. In middle- and higher-order streams in low-gradient settings, they are important areas of energy dissipation which function to help protect downstream areas from hydromodification. Maintaining connections between streams and their floodplains allows higher flows to readily access wide overbank areas which slow water and reduce energy.

Example areas that could be managed for each of the functions described above are shown in Figure 24. This more-integrative approach will require creation of mechanisms for placing management resources in the most appropriate portion of the watershed, which may not be at the specific project site being evaluated by a particular regulatory action (e.g., off-site mitigation, fee-based management programs).



Figure 24. Example areas within a watershed where individual process-based management actions may occur.

3.2 Watershed Analysis

Watershed analysis should be the foundation of all hydromodification management plans. Analysis should identify the nature and distribution of key watershed processes, existing opportunities and constraints in order to help prioritize areas of greater vs. lesser concern.

A general objective should be to identify watershed management zones based on key watershed processes and opportunities (e.g., infiltration, sediment yield). For most watersheds, they can be roughly divided into sediment source areas, transport reaches, and deposition/storage areas (Figure 25).

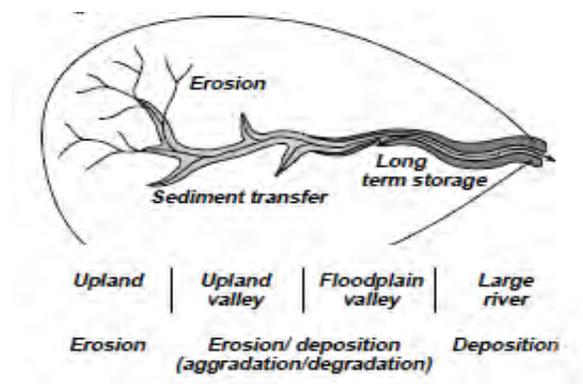


Figure 25. Conceptual functional zones of an idealized watershed (Church, 2002).

Within these general zones, priority activities should be based on a comprehensive watershed analysis. The overall objective of the mapping is to identify major opportunities, such as floodplain protection or restoration, in-stream restoration, protection of sediment-supply areas and major constraints, such as sensitive resources, infrastructure, impending headcuts or other catastrophic channel response.

Watershed analysis can occur at a variety of scales depending on available information and management objectives. In general, *analysis at a hydrologic unit code (HUC) 10 or HUC 12 watershed* provides a balance between analytical complexity and availability of management options. This scale will often translate to the size of tributary watershed upstream of major named rivers. Watershed analysis can also occur at a variety of levels of detail and resolution. Simple analyses that rely on readily available data layers such as stream and wetland maps, land use, existing infrastructure, geology, and slope can provide a valuable starting point for guiding management decisions. These initial maps can be augmented and expanded based on needs as additional information and resources become available.

Watershed analysis can occur at variety of scales and resolutions depending on management needs and available resources.

Mapping, and in some cases modeling, is the basis of watershed analysis and should include data layers to facilitate the following analyses. Most of these data layers are freely available online. Further information on analysis tools is provided in the next section. These maps should be designed for iterative updates over time as new information becomes available:

- Dominant watershed processes – analysis of topography (10-m digital elevation model), hydrology, climate patterns, soil type (Natural Resources Conservation Service (NRCS) soil classifications), and surficial geology can be used to identify the location and type of dominant watershed processes, such as sediment source areas and areas where infiltration is important or where overland flow likely dominates. This can provide a template for the eventual design of management measures that correspond most closely to the pre-development conditions, which support processes that promote long-term channel health.
- Existing stream conditions – At a minimum the NHD can provide maps of streams and lakes in the watershed. Additional information on stream condition should be included to the extent that it is available. This could include major bed-material composition, channel planform, grade control locations and condition, and approximate channel evolution stage. Where channel susceptibility analysis has been done, results should be included (see Bledsoe *et al.*, 2010, 2012)¹. These maps can also be used to conduct general stream power evaluations.
- Current (past) and anticipated future land use – Current land use and land cover plus proposed changes due to general or specific plans. Existing or proposed floodplain development should be noted. Historical information on past land use practices or stream conditions including historic channel locations or alignments should be included if readily available. Classified land cover (National Land Cover Dataset (NLCD), 2006) is available from the Multi-Resolution Land Characteristics Consortium (MRLC).
- Potential coarse and fine sediment yield areas – methods such as the Geomorphic Land Use (GLU) approach (Booth *et al.*, 2010) can be used to estimate potential sediment yield areas based on geology, slope, and land cover.
- Existing flood-control infrastructure and channel structures – maps should include major channels, constrictions, grade control, etc. that affect water and sediment movement through the watershed. Any available information on water quality, flood control, or hydromodification management basins should also be included. The location of engineered flood control channels and their design capacity should be noted.
- Habitat – both upland and in stream, and riparian habitat should be mapped to help determine areas of focus for both resource protection and restoration. This may be based on readily available maps such as the National Wetlands Inventory and National Land Cover Database, aerial photograph interpretation, or detailed local mapping.
- Areas of particular management concern – these may include sensitive biological resources, critical infrastructure, 303(d) listed waterbodies, priority restoration areas, or other locations or portions of the watershed that have particular management needs.
- Economic and social opportunities and constraints – comprehensive watershed management includes consideration of opportunities for improving community amenities associated with streams, economic redevelopment zones, etc. Details on this are beyond the scope of this report, but emphasize the need to include planning agencies in the development of hydromodification management plans.

¹ The channel susceptibility tools produce scores/ratings for both the vertical and horizontal stream dimensions. If there is a need to assign a single rating to a stream reach, the more-sensitive measure should be used.

Results of the watershed analysis should be used to address questions such as:

- What is the inherent susceptibility/risk of various stream reaches to hydromodification?
- Where are natural or developed resources of concern that need to be protected?
- What areas are good candidates for various restoration or management activities?
- What areas are not suitable or highly constrained for future restoration actions?
- What are the likely future changes in land use and associated runoff processes?

The answers to these questions can be used to determine the most appropriate management actions for specific portions of the watershed. Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed.

3.3 Types of Management Actions

Comprehensive hydromodification management should include on-site measures, upland protection or restoration, floodplain restoration and management, and in-stream restoration. These measures are summarized below; guidelines for selecting specific actions are provided in the following sections:

On-site measures – *typically applied throughout the watershed:*

- low impact development (LID) practices;
- disconnecting impervious cover through infiltration, interception, and diversion;
- coarse sediment bypass through avoidance of sediment yield areas or measures that allow coarse sediment to be discharged to the receiving stream;
- flow-duration control basins to reduce runoff below a threshold value.

Upland protection through planning processes – *prioritize in source areas of the watershed:*

- avoid coarse sediment yield areas;
- restore upland areas producing excessive fine sediment;
- protect infiltration areas; and
- construct regional basins or other retention facilities.

Floodplain and stream restoration and management – *prioritize in transport and deposition areas:*

- stream corridor restoration;
- restoration and/or protection of floodplain/floodway habitat;
- restoration and/or protection of critical sediment-transport areas;
- upstream or downstream natural/bio-engineered grade control; and
- retrofit or repair of currently undersized structures (e.g., culverts, bridge crossings).

3.4 Selecting Appropriate Management Actions

Management actions should be selected in consideration of the location where the change in land use is planned and the anticipated changes in watershed processes. The location of management actions should be prioritized based on established goals and targeting management actions to the location in the watershed where they will have the greatest potential effect (based on the watershed analysis). In general, a multi-level strategy combining actions at different scales and locations may be necessary. In

highly-developed watersheds, management actions may primarily consist of a combination of on-site and off-site flow-duration control facilities. In less-developed watersheds, there may be more opportunities for upland restoration, avoidance of sediment source areas, and floodplain restoration.

In general, it is more effective to try and “prevent” hydromodification effects through land use planning than attempting to manage effects through on-site or regional flow-duration control. In particular, upland restoration and floodplain management or restoration can be effective at reducing the need for aggressive or large-scale flow duration, as indicated in Table 5. Therefore, where opportunities exist, these strategies should be prioritized.

In general, it is more effective to try and “prevent” hydromodification effects through land use planning than attempting to manage effects through on-site or regional flow-duration control

Table 5. Runoff management decision matrices.

		upper watershed									
sensitivity of d/s resources:		high			moderate			low			
		expected change in runoff			expected change in runoff			expected change in runoff			
		high	medium	low	high	medium	low	high	medium	low	
channel susceptibility	high	[Red]			high	[Red]			high	[Red]	
	medium	[Red]		[Yellow]	medium	[Red]	[Yellow]		medium	[Yellow]	
	low	[Red]		[Yellow]	low	[Yellow]		[Green]	low	[Green]	
		middle/lower watershed									
sensitivity of d/s resources:		high			moderate			low			
		expected change in runoff			expected change in runoff			expected change in runoff			
		high	medium	low	high	medium	low	high	medium	low	
channel susceptibility	high	[Red]			high	[Red]			high	[Red]	
	medium	[Red]		[Yellow]	medium	[Red]	[Yellow]		medium	[Yellow]	
	low	[Yellow]		[Green]	low	[*]	[*]	[*]	low	[*]	[*]
[Red]	aggressive flow-duration control										
[Yellow]	moderate flow duration control										
[Green]	low-levels of flow duration control										
[*]	candidate for off-site mitigation										

- Notes:
1. Upper watershed generally refers to source areas whereas middle and lower watersheds refer to transport and deposition areas, respectively.
 2. Sensitivity of downstream resources, change in runoff, and channel susceptibility are determined through the watershed analysis process.
 3. High, Medium, and Low categories should be defined based on individual watershed or regional analysis in concert with stakeholder input.

Chapter 3 of SCCWRP Technical Report #667 *Hydromodification Assessment and Management in California* (Stein *et al.*, 2012) provides a detailed discussion of potential management endpoint and actions that can be taken at various scales to achieve those endpoints. The following subsections provide considerations for prioritizing management actions.

3.4.1 *On-site Flow Control Measures*

On-site flow-duration control should be considered a primary management measure to help meet erosion potential/load ratio targets in streams that are at risk for hydromodification effects. Where there is a chance of downstream erosion, on-site flow control can reduce effects of development on channel form and structure. However, the level of control (i.e., the volume of water retained) can be adjusted based on:

- Expected changes in flow between pre-project (not pre-development) and post-project conditions;
- Susceptibility of the stream channel into which the discharge will occur; and
- Sensitivity of downstream resources (both natural habitats and critical infrastructure).

In contrast, where sites discharge to fully engineered channels², in-stream erosion may not be the primary management concern. In these cases, water quality and/or sedimentation in downstream receiving waters may be the primary factor influencing the design of on-site control facilities. In these instances, resources for hydromodification management may be better allocated to regional facilities or to upstream restoration actions.

3.4.2 *Regional Flow Control Measures*

Projects that discharge directly to fully-engineered channels, confluence points with substantially-larger watersheds, bays, and estuaries may still contribute to downstream water quality effects, but may have minimal effect on in-channel erosion. Furthermore, the contribution from smaller projects at the terminus of watershed management units (e.g., HUC 10 or HUC 12 watersheds) may be relatively small compared to the cumulative upstream discharges. In such cases, minimal on-site impacts may be best mitigated through contributions to regional basins, large restoration projects, or other facilities. A variety of mechanisms can be used to support regional off-sets, such as off-site mitigation, in-lieu fees, impact feeds, or community facilities districts. An example framework for an accounting and tracking system for on and off-site mitigation facilities in Ventura County, California, is provided in Appendix A.

3.4.3 *Protection and Management of Floodplains and Adjacent Uplands*

Upland protection (i.e., activities outside the stream itself) can be prioritized by position in the watershed, based on opportunities and constraints identified during the watershed analysis. As stated above, the goal is to restore watershed process; consequently, actions should be targeted to the appropriate portions in the watershed:

² In some instances a site may discharge to an engineered channel, which eventually transitions to a more natural channel. In these cases, on-site flow duration control may still be appropriate. Decisions should be based on a consideration of all downstream reaches and not just those immediately adjacent to the project site.

Source areas (typically in the upper portions of sub-watersheds): To the extent possible, coarse sediment yield areas should be protected. Development activities should avoid these areas and allow yield areas to be coupled to the appropriate stream. Legacy effect areas that produce excessive sediment, such as heavily grazed or farmed uplands should be restored. *Some source areas may contain key infiltration zones that should be protected. Conversely some source areas are characterized by naturally-impervious surfaces – development should be targeted for these areas to minimize pre- vs. post-project changes in runoff.*

Transport reaches (generally in the middle portion of catchments): Stream corridors can be protected where they are still intact and restored where the opportunity exists. Key infiltration zones that often occur at the transition between source areas and transport reaches should be managed for this function.

Deposition areas (generally in lower catchments): Floodplains can be protected where they are still intact and restored where the opportunity exists in order to support storage and infiltration functions. Management and restoration actions should focus on restoring the connection between streams and their adjacent floodplains.

3.4.4 Stream Restoration

Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed. Objectives for specific stream reaches may include stream protection, restoration, or stabilization and management:

Protect: This approach consists of protecting the functions and services of relatively-unimpacted streams in their current form through conservation and anti-degradation programs. This strategy should not be used if streams are degraded, or nearing thresholds of planform adjustment or changes in vegetation community. This strategy may apply following natural disturbances such as floods depending on the condition of the stream reach and the ability for natural rehabilitation to occur (due to how intact watershed processes are). The goal of this strategy is not to create an artificial preserve (such as a created stream running through an urban park) but rather a naturally functioning river system.

Restore: Restoration is considered re-establishing the natural processes and characteristics of a stream. The process involves converting an unstable, altered, or degraded stream corridor, including adjacent riparian zone (buffers), uplands, and flood-prone areas, to a natural condition. In most cases, restoration plans should be based on a consideration of watershed processes and their ability to support a desired stream type. The watershed analysis discussed above should be used to determine how and where watershed process should be protected or restored in order to best support stream and stream-corridor restoration. Restoration should apply to streams that are already on a degradation trajectory where there is a reasonable expectation that a more stable equilibrium condition that reflects previously existing conditions can be recreated and maintained via some intervention. Creating a stream system that differs from “natural conditions” is not considered restoration. Restoration may not be feasible in portions of developed watersheds where processes and floodplains have been irrevocably altered. In those cases, management, as a new channel form may be a more appropriate goal (see below).

Stabilize and manage as a new channel form: Once a stream channel devolves far enough down the channel evolution sequence, it is extremely difficult to recover and restore without substantial investment of resources. If critical thresholds in key structural elements, such as planform or bank height, are surpassed, streams should be allowed to continue progressing toward a new stable equilibrium condition that is consistent with the current setting and watershed forcing functions, if such progress does not pose a danger to property and infrastructure. Substantial alteration of flow or sediment discharge, slope or floodplain width may make it improbable that a stream can be restored to its previous condition. In such circumstances, it may be preferable to determine appropriate channel form given expected future conditions and “recreate” a new channel to match the appropriate equilibrium state under future conditions. For example, a multi-thread braided system may not be the appropriate planform based on new runoff and sediment pattern; instead, a single-thread channel or step-pool structure may be a more appropriate target.

The decision about which endpoint is most appropriate should consider a variety of factors relative to stated goals and objectives for each stream and the existing and expected landscape constraints. Table 6 provides general guidelines on the most appropriate strategy based on a variety of factors. The criteria listed in the first column are defined and assessed via the watershed analysis (previously discussed). The High, Medium, and Low criteria should also be defined through watershed analysis and modeling, in concert with watershed stakeholders.

Table 6. Relationship between various stream management endpoints and contributing factors. H = High, M = Medium, L = Low, which are defined based on the results of the watershed analysis and agreed upon objectives.

	Protect	Restore	Stabilize & Manage
existing channel condition (CEM)	I, II	II, III	IV, V
susceptibility class (screening tool)	L	M	H
available floodplain	H	H, M	L
buffer opportunity	H	H, M	L
instream natural resources	H	H, M	L
downstream resources	H	H, M	L
connectivity of stream corridor	H	H, M	L
future discharge relative to reference	L	L	M, H
sediment supply	H	H, M	L

In practice, a stream should be evaluated for each of the criteria in the first column. Stakeholders can add criteria to the decision matrix based on what is important in their area. Furthermore, criteria can be weighted differentially based on local priorities. The predominant condition for a given location should be used to inform the selected management endpoint. An example application is shown in Table 7.

Table 7. Sample application of the relationship between various stream management endpoints and contributing factors. H = High, M = Medium, L = Low, which are defined based on the results of the watershed analysis and agreed upon objectives. Shading indicates selections for a hypothetical example (see Figure 26). The majority of criteria in this example suggest that a restoration endpoint is appropriate for this stream reach.

	Protect	Restore	Stabilize & Manage
existing channel condition (CEM)	I, II	II, III	IV, V
susceptibility class (screening tool)	L	M	H
available floodplain	H	H, M	L
buffer opportunity	H	H, M	L
instream natural resources	H	H, M	L
downstream resources	H	H, M	L
connectivity of stream corridor	H	H, M	L
future discharge relative to reference	L	L	M, H
sediment supply	H	H, M	L

Hydromodification Management Decision Process

STEP 1 – opportunity for sediment-supply protection and if so, take advantage

STEP 2 – assess channel susceptibility using screening tool

STEP 3 – identify downstream resources of concern and opportunities for restoration

STEP 4 – predict E_p change under unmitigated conditions – can use gage data, regional curves or model

STEP 5 – use E_p change to estimate enlargement for the channel susceptibility class using models/curves (include confidence estimates)

STEP 6 – select size/aggressiveness of BMP/LID

STEP 7 – explore opportunities for off-site mitigation (e.g., regional basins, floodplain restoration, etc.)

STEP 8 – if necessary, and options available – pursue in-channel restoration

Note – STEPS 6, 7, and 8 should be done in concert with each other. Once the suite of management solutions are selected, return to STEP 4 and re-evaluate change in E_p under the mitigated condition.

Figure 26. Hypothetical example of summary of elements of the decision process for determining hydromodification management actions (flow control, upland restoration, stream restoration).

3.5 Decision-Making Conclusions

To improve the likelihood of long-term recovery and protection of beneficial uses, hydromodification management will need to evolve from a narrow focus on flow control to a more integrated approach that focuses on restoration of watershed processes and remediation of past and anticipated future instream effects. Integrated management relies on a watershed analysis that identifies key opportunities and constraints that can be used to prioritize the location and type of management actions. Such watershed analysis can range from simple to complex depending on goals, needs, and available resources.

Unfortunately, the current regulatory and management structure may not always be well suited to implement an integrated watershed-based management approach. Transitioning from site-based to watershed based management may require changes in the development and application of hydromodification policies and plans by the State and Regional Water Boards and local jurisdictions. In the short term, municipalities will need to consider broadening the approaches to on-site management measures and expand monitoring and adaptive management programs based on the tools described in this document. In the long term, regulatory agencies will need to consider developing watershed-based programs that allow for implementation of management measures in the locations and manner that will have the greatest impact on controlling hydromodification effects. A watershed-based approach will also allow the integration of hydromodification management objectives with related programs such as water-quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans. A logical next step is to demonstrate the application of integrated hydromodification management through stakeholder driven development of prototype watershed-based management programs. These early efforts will be valuable in guiding early implementation and refining the concepts presented in this document.

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**APPENDIX A: EXAMPLE OFF-SITE STORMWATER MITIGATION EVALUATION
FRAMEWORK, VENTURA COUNTY, CALIFORNIA**

Memorandum



DATE: February 17, 2012

TO: Ventura Countywide Stormwater Management
Program: Planning and Land Development
Subcommittee

SUBJECT: Offsite Mitigation Framework Options
(Tasks 2 & 3 of Offsite Mitigation Framework Study)

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INTRODUCTION

This memo is intended to provide agencies with information and options to develop an accounting and tracking framework for the mitigation of the Permit's Low Impact Development (LID) requirement. It is broken out into a brief background on the requirements and the estimated need for offsite mitigation across the county; the challenges of implementing offsite mitigation at different scales; an examination of programmatic and funding approaches; and the administration and accounting options available to public agencies.

BACKGROUND

The Ventura Countywide National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit (Order R4-2010-0108) allows technically infeasible new development and redevelopment projects to use alternative compliance measures if onsite retention and/or biofiltration best management practices (BMPs) cannot feasibly be used to meet the 5% Effective Impervious Area (EIA) standard.

Alternative compliance is based on the "mitigation volume." The mitigation volume is the difference between the volume of runoff associated with 5% EIA and the volume of runoff associated with the actual EIA achieved onsite less than or equal to 30% ($\leq 30\%$) EIA. The offsite mitigation requirement for EIA in excess of 30% ($>30\%$) is 1.5 times the amount of stormwater not managed onsite.

Reporting Requirements

According to the NPDES MS4 permit, Permittees must provide a list of offsite mitigation projects available for funding to project applicants. Reporting requirements include: a schedule for the completion of these projects, including milestone dates to fund, design and construct the projects; and the mitigation funds raised to date and pollutant and flow reduction analyses prepared by project applicants that illustrate that the results are comparable to what would have been achieved by meeting the 5% EIA standard onsite.

Summary of Projected Need

As a first step, the potential extent of mitigation needs was estimated by developing countywide growth projections, estimating the volume of offsite mitigation needed, estimating the size of BMP structures needed, estimating the costs to design and build, and identifying interagency areas of influence. This estimate determined the need for offsite mitigation ranges from minimal in some municipalities down to nonexistent for offsite mitigation in other municipalities. A summary of projected new development and redevelopment acreage requiring offsite mitigation is provided in **Tables 1 and 2**. The projected need is an approximate estimate and is subject to alteration depending on zoning or General Plan modifications, and rate of and type of future new development and redevelopments. Additional details on the projected need are provided in **Attachment C**.

Table 1. Estimated Offsite Mitigation Need by 10-digit Hydrologic Unit Code (HUC)

10-Digit HUC	Mitigation Volume		
	ft ³	ac-ft	gallons
Calleguas Creek	199,500	5	1,492,000
McGrath Lake-Frontal Pacific Ocean	85,900	2	642,400
Ventura River	19,000	0.4	141,900
Los Sauces Creek-Frontal Pacific Ocean	12,700	0.3	95,100
Lower Santa Clara River	7,800	0.2	58,600
Middle Santa Clara River	4,700	0.1	35,100
Malibu Creek	100	0.02	600
Upper Los Angeles River	0	0	0
Lower Piru Creek	0	0	0
Big Sycamore Canyon-Frontal Santa Monica Bay	0	0	0
Total	329,700	8	2,465,700

Table 2. Estimated Offsite Mitigation Need by Permittee

Permittee	Mitigation Volume		
	ft ³	ac-ft	gallons
Simi Valley	149,300	3	1,116,500
Oxnard	73,100	2	547,100
Camarillo	44,800	1	335,000
Unincorporated County Urban Areas	18,900	0.4	141,300
Ventura City	11,100	0.3	82,800
Thousand Oaks	10,600	0.2	79,300
Ojai	8,300	0.2	62,100
Moorpark	4,300	0.1	32,100
Santa Paula	3,900	0.1	28,900

Permittee	Mitigation Volume		
	ft ³	ac-ft	gallons
Port Hueneme	3,100	0.1	23,000
Fillmore	2,300	0.1	17,600
Total	329,700	8	2,465,700

These findings have several implications for the development of an offsite mitigation framework:

- The relatively small need projected for offsite mitigation diminishes the need for regional BMPs.
- It may be more cost effective and manageable for municipalities to meet the need with the implementation of just a few small offsite BMPs.
- The offsite mitigation framework should be flexible and adaptable enough to accommodate a variety of future growth scenarios.

Permit Provisions & Project Eligibility Criteria

Criteria for eligible offsite mitigation projects were recently developed by Permittees as part of a call for projects that solicited opportunities for regional offsite mitigation projects from interested stakeholders. The NPDES MS4 permit requirements guided the development of the eligibility criteria. The eligibility criteria combined with the estimated need is useful for identifying viable offsite mitigation options for Ventura County permittees. Relevant criteria for eligible projects include:

- Offsite projects must be located in Ventura County and within the same Hydrologic Unit Code (HUC).
- Offsite projects must be located such that the offsite mitigation project would achieve equivalent stormwater volume and pollutant load reduction as if the new development and redevelopment projects that will utilize the proposed alternative compliance project had complied with subparts 4.E.III.1.(a)-(d) of the permit. Project locations which can receive runoff from existing urban development meet this criteria.
- Offsite projects must be designed to retain and/or biofilter runoff from existing urbanized areas. In general, this should be accomplished via infiltration measures; however, stormwater harvesting and biofiltration will be considered on a site-specific basis. BMPs must be designed in accordance with the design guidance in the 2011 Technical Guidance Manual (TGM).
- Offsite mitigation projects may include green streets projects, parking lot retrofits, other site specific BMPs, and regional BMPs.
- Offsite mitigation projects must be able to be completed within 4 years of the certificate of occupancy for the first project that contributed funds toward the construction of the offsite mitigation project, unless a longer period is otherwise authorized by the Regional Water Board Executive Officer.

OVERVIEW OF PROJECT-SPECIFIC CHALLENGES

Several challenges exist that have the potential to constrain the type of offsite mitigation projects implemented by Permittees. One of the principle challenges in designing a funding mechanism for the proposed offsite facilities is the unpredictability of the timing of the need for the facilities. Several likely scenarios exist and are discussed below:

Scenario 1: Large Regional Facility

A large, regional multi-municipality facility, potentially involving multiple (roughly more than three) development projects, poses clear funding challenges and risks. Since development projects are difficult to predict in terms of size and timing, both the size and schedule for investment would be difficult to predict and manage, accordingly. In particular, permit requirements to achieve the minimum EIA technically feasible onsite combined with a small projected need are likely to limit the participation in regional facilities. The NPDES MS4 permit requires that offsite mitigation projects be completed “as soon as possible, and at the latest, within four years of the certificate of occupancy for the first project that contributed funds towards the construction of the offsite mitigation project.” The four year timeline makes the implementation of regional facilities challenging because it is likely that Permittees will have to construct a regional facility before a sufficient, “critical mass” of funds are received from developers.

It may take several years for a permittee to work with developers and accumulate the funds necessary for the design, construction and permitting of a regional facility. In addition to the uncertainty associated with funding, completing the construction of a regional facility in four years may be difficult given the length of time it takes to acquire necessary permits.

However, since there may be economic advantages resulting from the efficiencies of scale of a large, regional facility, this scenario, although not optimal, should not necessarily be discounted. A regional facility may be feasible if a permittee or a group of permittees felt that they could predict development size and timing and then build a facility to suit. As new development projects arose, and participated in the offsite mitigation, they could be required to pay their portion, plus interest, of the regional facility. In essence the municipalities would serve a developer/ bank, speculatively building the facility, but planning on recouping all of their investment from future development.

Water supply facilities are often set up using this approach in areas where development is predicted. The water supply agency designs and installs water treatment and piping capacity that is larger than needed, speculating that future development will occur, and can be tapped to reimburse the agency’s capital costs. Of course, this “build it and they will come” approach is particularly vulnerable to the risk that predicted future development does not occur, and the costs of the unused regional facility would be incurred by the Permittee.

Scenario 2 – Midsized Facility

Smaller, midsized facilities involving two or three developers may offer many of the offsite mitigation advantages without the same significant financial risk as regional facilities. Because of the smaller, more manageable number of participants, financing arrangements could be established and designed prior to design, construction and operations. This project would have to be completed within the four year window, as stipulated in the permit. As an example, a

municipality may elect to construct a retrofit on public land (e.g., bioretention area in parking lot) that could provide offsite mitigation for two or three developers.

Scenario 3 - Small Development Project-Specific Facility

Individual, development project-specific would allow the maximum control and the least financial risk to the municipalities in terms of establishing a funding mechanism. The entire financing arrangement would be established and designed prior to design, construction and operations. The primary disadvantage of this scenario is that it potentially results in a relatively high implementation cost to the developer. Additionally, the small amount of mitigation volume that is likely to result on a per project basis may not warrant the creation of a standalone BMP such as an infiltration trench. However, given the right set of site conditions, it could support the implementation of a small BMP such as a tree-well filter in the right-of-way located in front of the development project. This is further discussed under the option, “Developer Mitigates Offsite.”

PROGRAMMATIC/ FUNDING APPROACHES

The following section explores several options available to Permittees for an offsite mitigation funding framework. A survey was conducted in November 2011 to get an idea of what each permittee is considering for an offsite mitigation framework. The results of this survey (see **Attachment B**) were used to help determine the offsite mitigation framework options. Additionally, a review of other offsite programs was conducted and summarized in **Attachment A**. These programs included non-stormwater offset programs already being conducted by Permittees (e.g., parks) and stormwater quality offsite mitigation programs located outside of Ventura County. Aspects of these programs were incorporated into the options described below.

A description, advantages, and disadvantages are described for each funding approach (O&M and tracking discussed separately in next section):

- Developer Mitigates Offsite
- Purchase Credits through Private Seller
- In-Lieu Fee
- Impact Fee
- Community Facilities District
- Effective Combinations
- Additional Considerations that Cross Multiple Options

Developer Mitigates Offsite

Under this option, the developer is responsible for constructing a stormwater BMP offsite that will retain or biofilter the mitigation volume. Two primary scenarios exist under this option.

Developer Builds Offsite Mitigation Project on Private Property

The primary advantage of this approach is that it results in a potentially reduced burden on the Permittee, particularly if the developer or another third party is responsible for operation and

maintenance (O&M). Permittees will still have to ensure that the developer constructs a BMP that meets the intent of the permit and retains or biofilters the mitigation volume.

There are several disadvantages exist for this scenario. One disadvantage is that developers might have difficulty identifying a feasible offsite mitigation project within the municipality (or HUC). This could result in a high transaction cost for the developer and may introduce uncertainty into the project approval process and timeline. Additionally, since the offsite mitigation project is located on private land, the owner of the land must be willing to accept the liability and O&M associated with the project. Additional tracking is required to ensure that if the offsite location is redeveloped that the retained volume is not credited to the redevelopment.

Developer Builds Offsite Mitigation Project on Public Property

Under the second scenario, Permittees generate a list of options available to the developer on public land. The advantage of this scenario is that it reduces the burden on the Permittee and the developer (relative to other options). In this scenario, the developer takes on the responsibility of constructing the BMP, but their burden is reduced since they are not left with trying to find a viable retrofit opportunity. Permittees may provide the design and the location of the offsite mitigation project or just the location. This scenario is particularly desirable if the developer is able to implement a small BMP in the right-of-way such as a tree-well filter.

There are a few disadvantages to this scenario. Given the small offsite mitigation likely needed on a project-by-project basis it may not be technically or financially effective for each project to construct a standalone BMP such as an infiltration trench. It may also be undesirable if the public perceives this scenario as a donation of public land to developers (i.e., viewed as favoring certain developers). However, it is not uncommon for a municipality to dedicate land to developers for other public infrastructure projects such as parks or schools. Finally, the Permittee would likely be solely responsible for O&M costs. Additional options for O&M discussed under Program Administration.

Purchase Credits through Private Seller

This option requires a private company to take on the liability of mitigation, responsibility for O&M, and certify that offsite mitigation will be completed within four years of the certificate of occupancy and located within the same HUC. A private company can sell mitigation credits by either:

- Exceeding the volume they are required to retain onsite (i.e., they harvest and use more than the SQDV onsite)
- Retrofitting an unregulated site (i.e., currently has no stormwater quality management)

A private seller-oriented program would likely include the following steps:

- The developer proposing to purchase credits from a private seller documents the amount of mitigation volume needed and how it will be met using private mitigation (e.g., 120 street trees planted = 50 gallons mitigated). This documentation is included as part of the post-construction plan review submittals.
- The developer pays private company directly.
- The private company conducts mitigation (e.g., constructs retrofit).

- The private company reports to Permittee when the offsite mitigation project is completed.
- Permittee must verify that the BMP meets intent of permit provisions and has “credits” to sell.

The primary advantage of this approach is that the cost of the offsite mitigation project, including construction and O&M, is financed by private sector investors seeking to profit by selling credits. The credit system being considered by Washington DC is summarized in Attachment A.

There are several disadvantages to this approach. Given the small projected need for offsite mitigation, it is unlikely that it could support a marketplace of private sellers offering credits to developers within the HUC. Likewise, if this is the only option available to developers, Permittees may need to invest some time at the outset of the program to help foster an offsite mitigation credit marketplace (e.g., helping private sellers identify potential offsite mitigation opportunities). Additionally, an up-to-date tracking system would be necessary in order to ensure that available and used credits are accurately tracked to ensure that double-counting does not occur.

Reimbursement Agreement

Under this option, a developer that is eligible for offsite mitigation opts to construct an offsite mitigation facility that meets and exceeds their mitigation volume. Permittees may direct willing developers to a specific project that they have in mind. To facilitate cost sharing, the developer requests a reimbursement agreement with the City. When other developers eligible for offsite mitigation are identified by the permittee, the permittee collects and transfers an amount identified in the reimbursement agreement to the developer that entered into the reimbursement agreement. The amount should be in keeping with the facility’s available mitigation volume. This option is commonly used in Thousand Oaks for the extension of water and wastewater utilities.

The primary disadvantage of this approach is finding a developer willing to construct a facility that exceeds the required mitigation volume and who is willing to take on some uncertainty associated with payback. This option also does not create a straightforward mechanism for ensuring long-term O&M. One scenario may be to combine this option with a CFD tax that will cover O&M costs associated with the facility.

Negotiated Mitigation Agreement

A negotiated mitigation agreement (also commonly referred to as an in-lieu fee) between a developer and a public agency is a common and flexible approach to addressing mutual infrastructure and service needs. This approach, which may also be called a “mitigation fee”, “cash-out” involves the developer making a one-time payment associated with the mitigation, “in lieu” of meeting permit requirements onsite, or satisfying the associated financial obligation in some other way. Permittees collect and use these funds to identify, design and construct and manage offsite mitigation projects. These funds could also be used towards existing projects that currently retain more stormwater runoff volume than required or retrofit of an existing BMP to provide additional retention. To minimize local developer opposition or concerns from elected officials, the payment structure should be transparent and directly correspond to the costs associated with constructing and maintaining an offsite mitigation project.

A negotiated mitigation agreement/in-lieu fee is straightforward and usually accomplished by an ordinance (or modification to an existing ordinance) approved by a Council or Board of Supervisors. Recommendations for the adjustment or increase of a flat mitigation agreement will require approval by Council/Board of Supervisors. A nexus must also be created between the agreement and the Building or Grading permit. To reduce the frequency that the negotiated mitigation agreement/in-lieu fee must be adjusted via Council, calculation of the payment should include an inflation adjustment factor. Several existing mitigation fee programs within the County require that payment account for inflation using the construction cost index for Los Angeles as published by the Engineering News Record/McGraw-Hill Construction Weekly.

Two primary scenarios exist under this option:

- Flat Mitigation Agreement/In-Lieu Fee:** Under this scenario, Permittees develop a flat dollar amount per gallon of stormwater runoff that could not be retained or biofiltered onsite. The majority of communities with stormwater offsite mitigation programs utilize this approach (Attachment A). Payment is set so that it encompasses a variety of likely design and BMP scenarios. To provide consistency and transparency, it may be desirable to determine a Countywide fee versus a Permittee-by-Permittee or project-by-project one. Preliminary cost estimates based on capital costs for an infiltration trench and infiltration basin were calculated as part of the Offsite Mitigation Need Memorandum (see Attachment C). The memo determined the cost by volume to be approximately \$1.55 to \$3.65/ gallon. These numbers do not include the cost of land acquisition which could vary widely by permittee.

Example: Use of Flat Mitigation Agreement to fund Capital Costs and O&M costs:

Assumptions:

Capital Costs Offsite Facilities	= \$750,000 (generalized across BMP types)
# of Gallons Treated by Offsite Facility	= 150,000 (generalized)
Maintenance and Operations Costs	= \$750,000 (10% of capital costs/ yearly for 10 yrs)

Results:

Flat In-Lieu Fee	= $(750,000+750,000)/155,000 = \$10/\text{gallon}$
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- Project Specific In-Lieu Fee:** This scenario is also known as a market driven model where Permittees design, construct, and maintain the offsite mitigation project and recoup the costs for the project from a negotiated mitigation agreement. Payment is determined on a project-by-project basis and will therefore vary for each project. Discussion with other mitigation fee programs located within the County indicated that offsite mitigation programs are less administratively burdensome when funds are directed towards a pre-identified project.

Example: Project Specific Negotiated Mitigation Agreement to fund Capital Costs and O&M costs:

Assumptions:

Capital Costs Offsite Facilities	= \$750,000 (actual cost of BMP)
# of Gallons Treated by Offsite Facility	= 150,000 (actual)
Maintenance and Operations Costs	= \$750,000 (10% of capital costs/ yearly for 10 yrs)
Participating Developers	= 3 (assume equal need for offsite mitigation)

Results:

Project Specific In-Lieu Fee	= $(750,000+750,000)/155,000 = \$10/\text{gallon}$
Cost to each Developer	= \$50,000 (5,000 gallons each at \$10/gallon)

This approach has several advantages. This program allows funds to go to the Permittee which gives Permittees the ability to strategically direct retrofit efforts to priority areas (e.g., areas where infiltration is desirable). It also allows for the creative and flexible use of funds towards projects that work to reduce an equivalent volume of urban runoff. Options could include a street tree planting program or tax credits to homeowners that install LID practices on their property.

Additional advantages include reduced uncertainty from the developer's end. Once an agreement is determined, the developer's compliance is simple to calculate. Additionally, O&M responsibility is usually shifted to Permittee which provides certainty for the long-term function of the BMP.

The primary disadvantage of this option is that the administrative and long-term maintenance burden falls on the Permittee. A flat mitigation agreement/in-lieu fee is also challenging to identify and set so that it fairly recoups the costs associated with a wide range of projects. As an example, a Permittee may opt to implement an expensive harvest and reuse project or a modest infiltration project. The flat in-lieu fee must be able to cover the costs of both types of projects. In-lieu fees cannot be collected annually to support O&M so an established fee will have to incorporate the estimated future costs associated with O&M and inflation.

Additionally, some uncertainty exists for Permittees' ability to recoup the costs of BMP design, engineering, permitting, construction, and O&M for regional and midsized facilities. This is particularly true for offsite mitigation projects where construction is necessary prior to all the funds coming in from multiple developers.

Impact Fee

Similar to in-lieu fees, impact fees are one-time-only capital infusions. Impact fees are typically used to defray the cost of public facilities related to development projects (e.g., traffic impacts or affordable housing needs associated with commercial construction) versus a fee in-lieu of a development-specific requirement. These fees are often collected when the building permit is issued. The main disadvantage is that impact fees must adhere to Government Code Section 66000 (also known as the Mitigation Fee Act). This adds an additional layer of requirements including extensive public reporting.

Another disadvantage of implementing an impact fee is addressing any opposition from local developers and garnering support from the City Councils and/or Boards of Supervisors. However, since this impact fee would only affect a self-selected project, no resistance is expected from local developers nor elected officials so long as the fee bears a reasonable

relationship to the offsite facility. Unfortunately, impact fees cannot be collected annually to support O&M so an established fee will have to incorporate the estimated future costs associated with O&M and inflation.

It should be noted that impact fees implemented by a municipality often serve as the basis for negotiations that result in an in-lieu fee, because of the preferred flexibility available of an in-lieu fee.

Example: Impact Fees to fund Capital Costs (in combination with a CFD to fund O&M costs):

Assumptions:

Capital Costs Offsite Facility	= \$750,000		
Payback Period	= NA		
Maintenance and Operations Costs	= \$10,000 per year		
Participating Developers	= 3 (assume equal need for offsite mitigation)		

Results:

Impact Fee	= (750,000)/3	=	\$250,000
Annual Rate CFD O&M Rate	= (10,000)/3	=	\$ 3,333

Community Facilities District (CFD)

Ventura County currently has many localized special taxes, benefit assessments and fees (including the current funding mechanism for stormwater management) that fund the installation, maintenance and operations of various local infrastructure. These appear as “direct charges” on Ventura County property tax bills. The special taxes are primarily Community Facilities Districts (more commonly known as CFDs or Mello-Roos Districts), and the assessments are primarily Landscaping and Lighting Assessment Districts (LLADs). Both CFDs and LLADs are very effective and manageable, and are commonly used to fund maintenance of perimeter landscaping improvements for larger residential developments throughout the State. Most importantly, they are routinely established during the residential development phase, while the developer owns all of the property (and all the votes, accordingly), because they are politically challenging, requiring a balloting of all affected property owners, after the individual developed properties have been sold.

Since LLADs are more costly and difficult to set up, more limited in their use, and have greater legal risk than CFDs, they are not discussed further here. The only real advantage the LLADs have over CFDs is the arguably unfair negative reputation of Mello-Roos which arose during production house building in Southern California in the 1980 and 1990s; when homeowners felt duped by Mello-Roos charges as hidden costs. This should not be a factor regarding this offsite mitigation project.

CFDs can be set up by the Permittee, and are straightforward and well-proven. They require the development of a “Rate and Method of Apportionment” which documents the specific fee amount for a particular type of property and size; three resolutions, a tax report and ballot.

Properties can readily be annexed into a CFD and need not be contiguous – an important consideration for this project. Similar to in-lieu fees, they can include an option to adjust on an annual basis to reflect inflation and can include expiration dates called “sunset provisions” which corresponding to the payoff of capital costs.

In this case, a countywide or citywide “parent” CFD could be established which readily facilitates future annexations of specific development projects supporting specific BMP costs. On the other hand, specific CFDs could be setup for each specific development project. It typically takes about four months to implement the initial “parent” CFD and two months for each individual annexation.

Revenue from the CFDs can be used to pay back capital costs, as well as for O&M. A lien is placed on the propert(ies) subject to the CFD which helps ensure payment in the future, although the Permittee may have to finance the construction. Typically the rate is set to payback the capital component over a number of years in addition to maintenance. CFDs can be used as the underlying financial mechanisms to support the sale of bonds, although that is not likely in this case.

Although CFDs are highly reliable funding mechanisms, there are several disadvantages including the need for the Permittee to finance the proposed facility because the CFD tax will likely not generate enough revenue in the first year to pay for design, construction and permitting. The cost of establishing, and then annually managing the administration of the CFD tax, is not trivial, and may be several thousand dollars per year. These costs must be balanced against the cost of the annual maintenance which may be less. In any case, the annual administration can and should be included in the tax rate to ensure that all Permittee’s costs are recovered. It is worth noting that many Permittees (e.g. Moorpark) within the County already manage multiple CFDs and/or LLAD districts, so these administration costs can be shared and reduced. Also, similar to several of the other proposed funding mechanisms, the Permittee is burdened with the responsibility of the design, construction and permitting and O&M of the facility.

Example: CFD to fund Capital and O&M costs:

Assumptions:

Capital Costs Offsite Facility	= \$750,000
Payback Period	= 20 years
Maintenance and Operations Costs	= \$10,000 per year
Participating Developers	= 3 (assume equal shares)

Results:

Annual Rate for Year 1 thru 20	= $((750,000/20) + (10,000))/3$	=	\$15,833
Annual Rate for year 21 +	= $(10,000)/3$	=	\$ 3,333

Note: this simple example does not include financing costs

Effective Combinations

Permittees may want to consider combining several of the options presented above in order to maximize advantages and minimize the disadvantages. CFDs in particular can be combined with a number of the options presented above in order to provide a long-term source of funding for O&M. Impact fees and in-lieu fees can be used to collect funds from the developer to construct offsite facilities and supplemented with a CFD tax that provides funding for O&M via future property owners. This option is attractive to the Permittee since funding is received upfront for the construction of the facility (versus spreading it out over 20 years) and funding is provided

over the long-term for O&M. Similarly, this option is likely to be attractive to developers since the cost of O&M is directed to future property owners.

Another option may be to combine the private seller option with the developer mitigates offsite option. In this case, a developer constructs a sizeable facility that exceeds the amount of mitigation required by their development site. The developer is then able to sell off credits to other developers for a profit (this is similar to the “Reimbursable Agreement” option).

PROGRAM ADMINISTRATION AND ACCOUNTING

Several options for administering the accounting and programmatic aspects of an offsite mitigation program are described below.

Program Administration

Administering an offsite mitigation program requires several considerations including whether or not projects will be allowed to go outside the municipality, how tracking and reporting will be handled, and who will be responsible for O&M. These aspects of program administration are discussed in further detail below. The most likely options include municipality-by-municipality operated program or a Joint Powers Authority (JPA). If municipalities opt to allow offsite mitigation projects to occur watershed-wide, but do not establish a JPA other mechanisms such as memorandums of understanding (MOUs) will be required to address exchange of funds, maintenance responsibilities, etc.

Cross-Municipality Coordination

Allowing offsite mitigation projects to go outside of the municipality (but stay within the HUC) can increase flexibility and the number of options available to developers and Permittees alike. It also fosters a countywide approach that creates a level playing field for developers seeking offsite mitigation throughout the County. If offsite mitigation projects are allowed to occur within the HUC, several programmatic aspects must be addressed including tracking, exchange of funds, liability, and O&M responsibility.

If in-lieu fees, impact fees and/or CFDs are used to provide funding for construction and/or O&M, the funds will have to be collected by the municipality in which the development project takes place and then transferred to the municipality where the mitigation occurs.

At a minimum, municipalities that are willing to coordinate offsite mitigation projects on a watershed-wide basis should establish a MOU that documents mutually acceptable arrangements. The Calleguas Creek watershed is one example where it may be beneficial for multiple municipalities to coordinate offsite mitigation efforts. Coordination and exchange of funds across municipalities may be best facilitated through the establishment of a JPA (discussed in further detail below). Additionally, a countywide tracking program should be established in order to track the amount of mitigation volume available for each project.

Joint Powers Authority (JPA)

A JPA is an entity permitted under California law where two or more municipalities operate collectively. A JPA has a separate Board of Directors and is given powers, including taxing and planning authority authorized by an agreement typically referred to as a joint powers agreement. The term, membership, and standing orders of the Board of the JPA must be specified in the

agreement. The JPA may employ staff and establish policies independent from their participating jurisdiction. JPAs allow the pooling of resources between two or more municipalities that are working together to address an issue that transcends municipal boundaries.

JPAs offer several advantages to an offsite mitigation program. Under a JPA, municipalities located within the same HUC would be able to more easily combine in-lieu or impact fees, and CFD taxes received from developers and therefore reduce the uncertainty of recouping the funds necessary to construct an offsite mitigation project.

Tracking & Reporting

Some level of tracking will be necessary regardless of the offsite mitigation option selected in order to ensure that the mitigation volume needed is matched up with the mitigation volume provided. Tracking becomes particularly important if offsite mitigation projects are allowed to go outside of the municipality and/or if credits are available for purchase through a private seller. Both options require an up-to-date tracking system to ensure that available and used credits are accurately tracked to ensure that double-counting does not occur. In the case of cross-municipality offsite mitigation, a countywide (or watershed wide) tracking program may be necessary to track the amount of mitigation volume available for each project.

Administration Costs

Permittees should consider mechanisms to recover the costs associated with administering an offsite mitigation program. This includes additional plan review time, review and oversight of acceptable offsite mitigation projects, tracking offsite mitigation projects and available mitigation volume, and annual reporting. Permittees should consider either incorporating these costs into an in-lieu fee or as an administrative fee charged as part of the plan review process. If possible, these fees should include the cost associated with education and outreach as discussed under private O&M responsibility below. In cases where the developer mitigates offsite, allowances should be made for the Permittee to recoup administrative costs

Discussions with other mitigation fee programs located within the County indicated that plan review time is recouped by directly billing the developer the time spent reviewing each individual project (hourly rate * hours spent on review).

O&M Responsibility

Any selected option must take into account how the offsite mitigation project will maintain function over the long-term. O&M considerations apply to permittee maintained offsite mitigation projects, privately maintained projects, and projects that cross municipal boundaries.

Permittee Maintained

O&M responsibility with the Permittee provides the greatest certainty for BMP maintenance, but presents challenges when determining how to adequately recoup O&M costs from the developer and/or property owner. Permittees should incorporate the cost of O&M and associated inflation into any in-lieu fees and/or CFD taxes established for offsite mitigation projects. Generally, Permittees should anticipate performing maintenance for at least 10 years at a cost of approximately 10% of the offsite mitigation project construction costs.

Privately Maintained

Developer or property owner maintained offsite mitigation projects reduce burden to the Permittees but are more difficult to ensure adequate maintenance over the long-term particularly if responsible parties go bankrupt. In order to ensure O&M of the project, Permittees should consider requiring the responsible party to enter into an escrow agreement with the Permittee. As mentioned in the following section, the developer could be required to pay a set amount equal to some minimum percent (%) of the construction cost of the BMP into the escrow account. This amount could be used by the Permittee in the event that the developer and/or landowner go bankrupt. Permittees could also require the developer to establish the escrow and continue to replenish as it is drawn down for maintenance activities so that the account maintains a minimum level of funds. Additionally, Permittees may have the option of putting a tax lien on the property to pay for O&M or cloud the title. A title with a cloud essentially places a yellow flag on a title and will create cause for closer scrutiny creating difficulty for the property owner when or if they attempt to sell the property.

If O&M responsibility remains with private parties, permittees should consider implementing an education and outreach program that addresses proper BMP maintenance. Education and outreach should address what should be maintained and how often.

Accounting Mechanisms

Funds for offsite mitigation should be collected and deposited into a dedicated fund solely for the purposes of constructing and maintaining offsite mitigation projects. Funds should be restricted so that they cannot be used for other purposes. Options available to Permittees include an escrow account, enterprise funds, and/or a designated revenue account.

Escrow Account

Escrow Accounts are used to hold funds that do not necessarily belong to a given party. An escrow account could be established to provide additional security to the Permittee and/or the developer. The developer could place funds into an escrow account that are dedicated to the construction of an offsite mitigation facility. In this case, the Permittee would benefit from the security that developer has dedicated funds for the project, and are available even if the developer declares bankruptcy during the project. Similarly, the developer would benefit from the security of knowing that the funds are not co-mingled with other city funds. Most likely, an escrow account would only be beneficial if a negotiated funding approach is used in which the developer directly agrees to a certain level of investment. Conversely, if a legally structured approach such as a CFD or impact fee is used, the Permittee would simply place the funds in a dedicated internal account.

Enterprise Funds

Enterprise funds provide goods or services to the public for a fee that makes the entity self-supporting. Government-owned utilities (such as water or wastewater facilities) are examples of enterprise funds. An enterprise fund could be established to collect “fees” from the developer and spend the revenue on construction, O&M of the offsite mitigation funding. There may be advantages to this approach with increased transparency and convenience, especially if multiple municipalities are involved. However, these enterprise fund fees would be regulated by

Proposition 218 as “property-related fees” and would likely be subject to legal and balloting requirements that would severely limit their use.

Designated Revenue Account

Permittees can set up a designated revenue account solely for the purposes of accepting and holding funds from developers received through a in-lieu fee or impact fee programs or CFD taxes. Developers write checks which are then deposited into a designated revenue account where funds are restricted for the use of offsite mitigation projects.

Bridge Funding

If a funding approach is used in which the capital costs are not completely paid up front by the developer, financing will be required. In most cases, for the relatively small capital costs of the proposed facilities, the municipalities should consider self-financing where they pay the initial capital costs and the developer pays it back, plus interest, over time, perhaps through a CFD. If for some reason, self-financing is not available, the municipalities could consider the use of bonds, grants, or a third party approach as a financing tool.

Bonds

Bonds are debt instruments in which an investor loans money to an entity that borrows the funds for a defined period of time at a fixed interest rate. In this case, a Permittee would engage a Financial Advisor and/or Bond Counsel to arrange to sell bonds to raise the capital cost amount needed. The Permittee would then pay back the bond holders at an agreed interest rate and schedule. The Permittee would be paid back, in turn, by a funding mechanism such as a CFD in the amount and on the same schedule as the bond payments. Use of bonds to pay for capital improvements is quite common in California, but there are significant financing costs, which would be borne by the developers, that may make this approach less attractive. A similar approach using Certificates of Participation, (also known as COPs) should also be explored. The significant overhead cost of bonds most likely makes them infeasible given the predicted small need for offsite mitigation facilities.

Grants

State grants are typically awarded through a highly competitive process, often require matching local funds, tend to be focused on capital expenses, are often narrowly focused in terms of scope and services, and can have significant administrative overhead. In addition, most grants are seldom designed to fund the O&M. Nonetheless, the revenue opportunities provided by grants is significant enough that they could be considered a viable approach.

If State grants such as Proposition 84 are pursued, applications should be written to maximize flexibility in use of the funds so the grant award can contribute towards annual expenses. Coordinating with other affected permittees to put forth larger and potentially more competitive grant applications is advised.

Third Party Financing

Occasionally, third party entities have provided financing assistance for infrastructure. These could include private, for profit entities like banks, or not-for-profit entities like environmental organizations. Although the projected need does not seem to warrant the construction of regional

facilities, multi-functional offsite mitigation projects may still be an attractive option for third parties such as municipal water districts.

CONCLUSIONS

A variety of options are available to Permittees for forming the basis of an offsite mitigation program. Each permittee should select an option(s) based on the factors that are of most concern to their community such as projected offsite mitigation need and consideration of burden to permittees and developers. The Developer Builds Offsite Mitigation Project on Public Property, Project-Specific In-Lieu Fee, and CFDs appear to be the most viable options based on need and consideration of burden to permittees and developers. **Table 3** summarizes offsite mitigation program options by responsible party. **Table 4** summarizes the options by several factors including permittee responsibility, permittee risk, developer responsibility, compatibility with projected need, and adaptability to changing need.

Table 3. Summary of Offsite Mitigation Options by Responsibility

Offsite Mitigation Option	Responsibility		
	Construction	Ownership	Maintenance
Developer Builds on Private Property	Developer	Developer/ Property Owner	Developer/ Property Owner
Developer Builds on Public Property	Developer	Permittee	Permittee
Purchase Credits through Private Seller	Private Seller	Private Seller	Private Seller
Reimbursement Agreement	Developer	Permittee	Permittee
Flat In-Lieu Fee	Permittee	Permittee	Permittee
Project Specific In-Lieu Fee	Permittee	Permittee	Permittee
Impact Fee	Permittee	Permittee	Permittee
CFD	Permittee	Permittee	Permittee

Table 4. Summary of Offsite Mitigation Options

Offsite Mitigation Option	Permittee Responsibility	Permittee Risk/Liability	Developer Responsibility*	Compatibility w/ Projected Need	Adaptability to Changing Need
Developer Builds on Private Property	Low. Permittee must verify that BMP fulfills mitigation volume requirements.	Low. Developer identifies site and constructs. May be difficult to guarantee private O&M of project.	High. Developer must identify and construct BMP offsite.	Low. Unlikely that the small mitigation volume supports construction of a new standalone BMP.	High. Developer builds what he/she needs; may be somewhat limited by space availability.
Developer Builds on Public Property	Medium. Permittee must find public property available and suitable for offsite mitigation.	Medium. Developer constructs but likely that Permittee takes over O&M of project; unknown liability if project is not properly constructed.	Medium. Developer must construct.	Medium to High. Developer may be able to implement small BMPs in right-of-way.	High. Developer builds what he/she needs; may be somewhat limited by space availability/ site constraints.
Purchase Credits through Private Seller	Medium. Permittee must verify private projects and keep accurate and up-to-date tracking of credits.	Medium. Risk that market for private seller will not exist or not enough to sustain over long-term.	Low. Developer pays third party; third party takes on liability of mitigation and O&M.	Low. Medium to high mitigation volume is needed in order to sustain.	Low. Realistically, a medium to high mitigation volume is needed in order to sustain.
Reimbursement Agreement	Medium. Permittee must verify private projects and keep accurate and up-to-date tracking of available mitigation volume.	Low. Developer identifies site and constructs. Need to identify mechanism to ensure funding for long-term O&M.	High. Developer must construct BMP offsite and get reimbursed as additional offsite needs come in.	Medium to High. Depends on whether or not the flat in-lieu fee will be used for regional, midsized, or project-specific facilities.	Medium. Program could be altered if growth projections change (e.g., could shift focus from midsized facilities to regional).
Flat Mitigation Agreement/ In-Lieu Fee	High. Permittee must identify, construct and maintain offsite mitigation projects.	Medium to High. Difficult to encompass cost of all scenarios under flat fee. Low guarantee that funds will cover regional facility. Guaranteed O&M since covered by Permittee.	Low. Developer makes payment to Permittee; Permittee takes on O&M.	Medium to High. Depends on whether or not funds will be used for regional, midsized, or project-specific facilities.	Medium. Program could be altered if growth projections change. A change in payment would have to go through Council.
Project Specific Negotiated Mitigation Agreement/ In-Lieu Fee	High. Permittee must identify, construct and maintain offsite mitigation projects.	Low to Medium. Fair share is allocated to developers. Low guarantee that enough developers come in to cover a regional facility. Guaranteed O&M since responsibility of Permittee.	Low. Developer makes payment to Permittee. Permittee takes on O&M.	Medium to High. Depends on whether or not funds will be used for regional, midsized, or project-specific facilities.	Medium. Program could be altered if growth projections change (e.g., could shift focus from midsized facilities to regional).
Impact Fee	Very High. Permittee must identify, construct and maintain offsite mitigation projects and adhere to Govt Code Sec 66000.	Medium to High. Difficult to encompass cost of all scenarios under flat fee. Low guarantee that fee will cover regional facility. Guaranteed O&M since covered by Permittee.	Low. Developer pays Impact fee to Permittee; Permittee takes on O&M.	Medium to High. Depends on whether or not the impact fee will be used for regional, midsized, or project-specific facilities.	Medium. Program could be altered if growth projections change. A change in fee would have to go through Council.
CFD	High. Permittee must set up and construct and maintain project.	Low to Medium. Fair share is allocated to developers. Low guarantee that enough developers come in to cover a regional facility. Guaranteed O&M since covered by CFD taxes.	Low. Developer sets up CFD which pays for capital costs and O&M.	Medium to High. Depends on whether or not the impact fee will be used for regional, midsized, or project-specific facilities.	Low. Once CFD tax rate is establishes, it cannot be easily modified other than annual CPI increase.

*Based on administrative, construction and O&M burden and generalized perceptions of option

ATTACHMENT 64

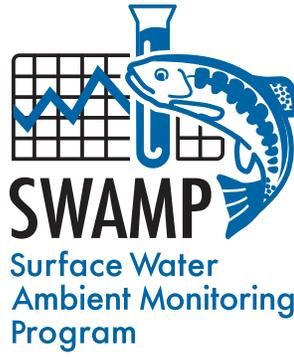
Bioassessment of Perennial Streams in Southern California: A Report on the First Five Years of the Stormwater Monitoring Coalition's Regional Stream Survey



Raphael D. Mazor

Southern California Coastal Water Research Project

SCCWRP Technical Report 844



Ventura Countywide
Stormwater Quality
Management Program



Council for Watershed Health



COUNTY OF SAN BERNARDINO
DEPARTMENT OF PUBLIC WORKS



A REGIONAL APPROACH TO EVALUATING THE BIOLOGICAL CONDITION OF SOUTHERN CALIFORNIA'S WADEABLE STREAMS



2009-2013: THE FIRST FIVE YEARS OF THE STORMWATER MONITORING COALITION'S REGIONAL MONITORING PROGRAM

OVERVIEW

In 2009, the Southern California Stormwater Monitoring Coalition embarked on an ambitious effort to evaluate the biological condition of 4,300 miles of wadeable streams in the region's coastal watersheds. Over the ensuing five years, the coalition's participating agencies conducted extensive survey and sampling work at more than 500 randomly selected sites encompassing 15 major watersheds in California's South Coast region. Monitoring efforts that had historically been done with minimal coordination were unified around a cohesive, shared vision for the first time, generating high-quality data sets that have painted a powerful picture of regional stream condition. The SMC survey is a regional enhancement of the statewide Perennial Stream Assessment.



The mature riparian plants and biological complexity observed in upper portions of Trabuco Creek in the Santa Ana Mountains reflect a stream that is in good biological condition. 25% of wadeable stream-miles in Southern California were found to be in good condition in the five-year survey.

Caballero Creek, a channelized, algae-filled tributary to the Los Angeles River, reflects severe habitat degradation and impacts of elevated nutrient concentrations. The survey found that both types of stressors were widespread in Southern California streams.



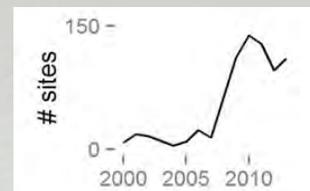
PROGRAM BENEFITS AND IMPACTS

- **Relevant to managers:** Comprehensive data sets inform decisions about priorities and resource allocation, and identify opportunities for causal assessment follow-up studies.
- **Cost-effective:** Each participant realizes approximately 10 times the data value relative to costs.
- **More influential:** Regional collaborations provide more data to inform statewide policymaking, and highlight local concerns.
- **Conversation-altering:** Provides a starting point for developing innovative management strategies that consider and go beyond water chemistry.

KEY FINDINGS

25% of the region's wadeable stream-miles are in good biological condition, including:

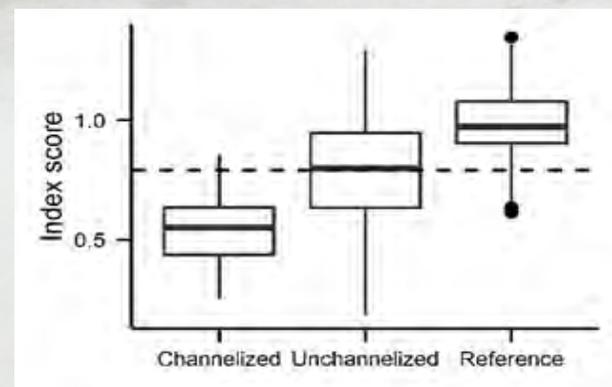
- 60% of stream-miles in open-space
- 9% in agricultural areas
- 2% in urban areas



The Regional Monitoring Program stream survey, which began in 2009, significantly increased the number of stream sites sampled in the region.

HIGH-PRIORITY STRESSORS ON WADEABLE STREAMS

Stressors affecting more than 25% of stream-miles	Stressors affecting 10% to 25% of stream-miles
<ul style="list-style-type: none"> • Nutrients (Nitrogen and Phosphorus) • Physical habitat degradation • Sulfates • Total dissolved solids 	<ul style="list-style-type: none"> • Chloride • Total suspended solids • pH



Index scores based on benthic macroinvertebrates were lower in channelized streams than non-channelized and reference streams; however, high scores for algal indices were observed in channelized streams where water quality was good. These findings provide a basis for regulators and stormwater agencies to discuss management strategies for channelized streams.

FOUR ECOLOGICAL CONDITION INDICATORS

The biological condition of streams was assessed by collecting data for four biological indicators. Each indicator is sensitive to a unique combination of stream stressors, allowing it to provide different types of information about a stream's overall health. Collectively, the four indicators provide comprehensive, direct evidence of a stream's capacity to support aquatic life, a more revealing approach than measuring the chemical concentrations of pollutants.

1 Benthic macro-invertebrates, such as aquatic insects, snails, and worms, respond to changes in habitat or water quality over their lifespans.



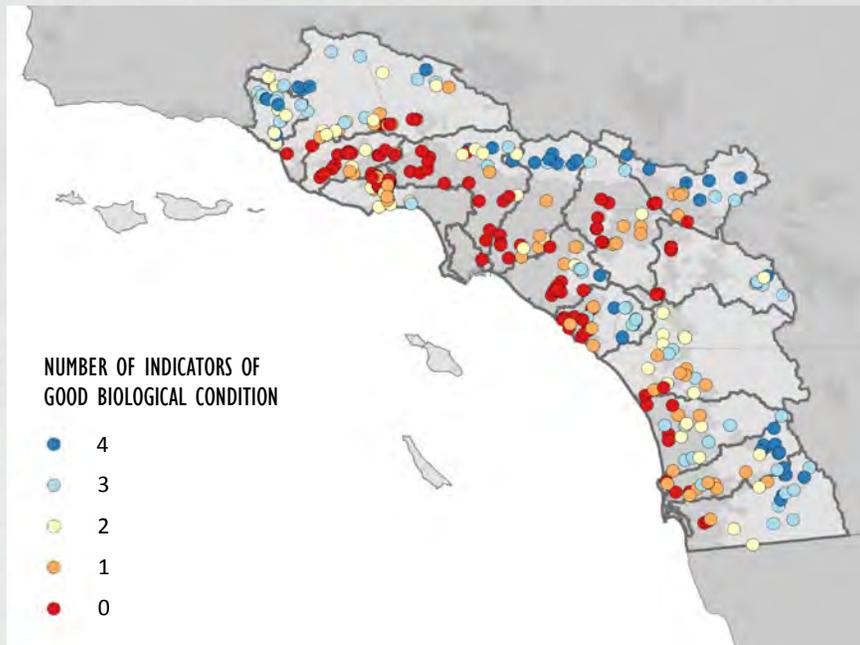
2 Soft algae, such as *Vaucheria*, may form clumps or filaments on submerged rocks. Some species proliferate when nutrients are elevated, while others thrive when nutrients are scarce.



3 Diatoms, such as *Navicula*, respond strongly to changes in water chemistry and sedimentation.



4 Riparian habitats, which support both terrestrial and in-stream wildlife, may be degraded by habitat alteration, upstream discharges, and hydrologic modification.



At the 500+ randomly selected sampling sites in the stream survey, anywhere from 0 to all 4 biological indicators indicated that a site was in good biological condition. The four indicators – benthic macroinvertebrates, diatoms, soft algae, and riparian habitat condition – collectively were used to assess a site's biological condition.

WATERSHEDS WITH MANY STREAMS IN GOOD CONDITION

- Ventura River
- Upper Santa Ana River
- Tijuana + Sweetwater + Otay Rivers

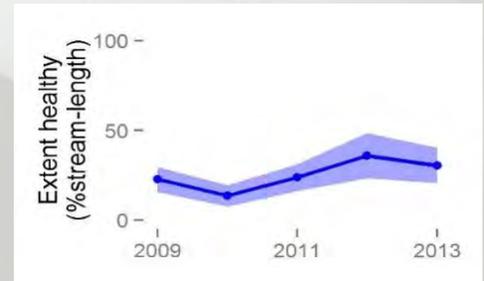
WATERSHEDS WITH FEW STREAMS IN GOOD CONDITION

- Calleguas Creek
- Lower Santa Ana River
- San Dieguito River + Carlsbad Hydrologic Unit

NO APPARENT TRENDS

Although there was some year-over-year variability, the survey did not find a change in the health of the streams over the five-year sampling period, from 2009 to 2013.

Urban streams tended to be in consistently poor biological condition, whereas open-space and agricultural streams tended to experience greater year-to-year variability.



The portion of healthy stream-miles fluctuated over the five-year sampling period, but overall showed no clear trends in either direction. The blue shading represents the 95% confidence interval.

A NEW SURVEY UNDERWAY

The success of the SMC's Regional Monitoring Program has paved the way for a second round of the program, which began in spring 2015. The first five-year survey will serve as a baseline for detecting trends over time.

The second cycle includes nonperennial streams, a critical habitat that makes up more than half of the region's stream-miles, and will seek to clarify the linkage between stressors and biotic integrity.

STORMWATER MONITORING COALITION MEMBERS

County of Los Angeles Department of Public Works, County of Orange Public Works, County of San Diego Department of Public Works, Riverside County Flood Control and Water Conservation District, San Bernardino County Flood Control District, Ventura County Watershed Protection District, City of Long Beach Public Works Department, City of Los Angeles Department of Public Works, California Regional Water Quality Control Board—Santa Ana Region, Los Angeles Region, and San Diego Region, State Water Resources Control Boards, California Department of Transportation, Southern California Coastal Water Research Project (SCCWRP). Collaborating organization: U.S. Environmental Protection Agency Office of Research and Development | www.socalsmc.org

DEVELOPED IN COLLABORATION
WITH THE SURFACE WATER
AMBIENT MONITORING PROGRAM



Bioassessment of Perennial Streams in Southern California: A Report on the First Five Years of the Stormwater Monitoring Coalition's Regional Stream Survey

Stormwater Monitoring Coalition Bioassessment Workgroup

**Prepared by Raphael D. Mazor
Southern California Coastal Water Research Project**

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ACRONYMS

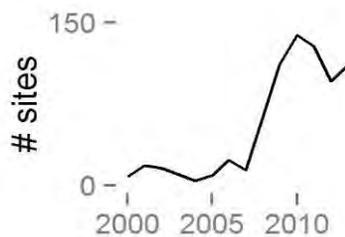
Acronym	Definition
AFDM	Ash-free dry mass
CI	Confidence interval
CMAP	California Monitoring and Assessment Program
CRAM	California Rapid Assessment Method
CSCI	California Stream Condition Index
CTR	California Toxics Rule
D18	Diatom Index of Biotic Integrity
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
IBI	Southern and Central California Index of Biotic Integrity
NHD	National Hydrography Dataset
NRSA	National Rivers and Streams Assessment
O/E	Ratio of Observed to Expected Taxa
PCT_BIGR	% large substrate (>128 mm)
PCT_CPOM	% cover by coarse particulate organic matter
PCT_FAST	% fast-water habitat
PCT_MAP	% macroalgae cover
PCT_MCP	% macrophyte cover
PCT_MIAT1	% cover by thick (>1 mm) microalgae
PCT_SAFN	% sands and fines (≤ 2 mm)
pMMI	Predictive Multi-Metric Index
PSA	Perennial Stream Assessment
S2	Soft Algae Index of Biotic Integrity
SD	Standard Deviation
SMC	Stormwater Monitoring Coalition
TDS	Total Dissolved Solids
TN	Total Nitrogen
TP	Total Phosphorous
XEMBED	Mean % cobble embeddedness
XFC_NAT_SWAMP	Natural fish cover
XMIATP	Mean microlagae thickness (where present)

EXECUTIVE SUMMARY

Streams are important natural resources in the South Coast of California, a region that extends from Ventura to San Diego counties. Competing needs for aquatic resources are intense and growing. Assessing the biological condition of these streams has been the focus of considerable monitoring activity. However, until 2009 these efforts were minimally coordinated and provided only limited information about the health of streams in the region, as a result of an emphasis on end-of-watershed monitoring. The Stormwater Monitoring Coalition (SMC) regional perennial stream survey was created in response to the need for a more holistic and coordinated approach. This report provides the results of a five-year probability-based bioassessment of southern California's perennial wadeable streams and represents one of the most comprehensive assessments of stream conditions in the United States.

The five-year survey was designed to answer key questions that are essential to watershed management:

- 1) What is the biological condition of perennial streams in the region?
- 2) What stressors are associated with poor condition?
- 3) Are conditions changing over time?



The Stormwater Monitoring Coalition has greatly increased the number of sites sampled in southern California.

Answering these questions at the regional scale provides resource managers with the ability to contextualize their programs and improve understanding of the effectiveness of management actions, prioritization of streams most in need of protection, and identification of stressors that are likely to pose the greatest risk to stream health.

Prior to the initiation of the SMC perennial stream survey, bioassessment efforts in southern California had a limited ability to answer any of these questions. Lead monitoring agencies worked

with little coordination, typically addressing site-specific problems with sometimes incomparable methodologies and rarely sharing data. Targeted monitoring mandated by permits did not provide the regional context needed to inform management decisions. Earlier probabilistic sampling efforts in southern California were limited (rarely more than a handful of sites per year), and were conducted as a small part of a statewide or national assessment.

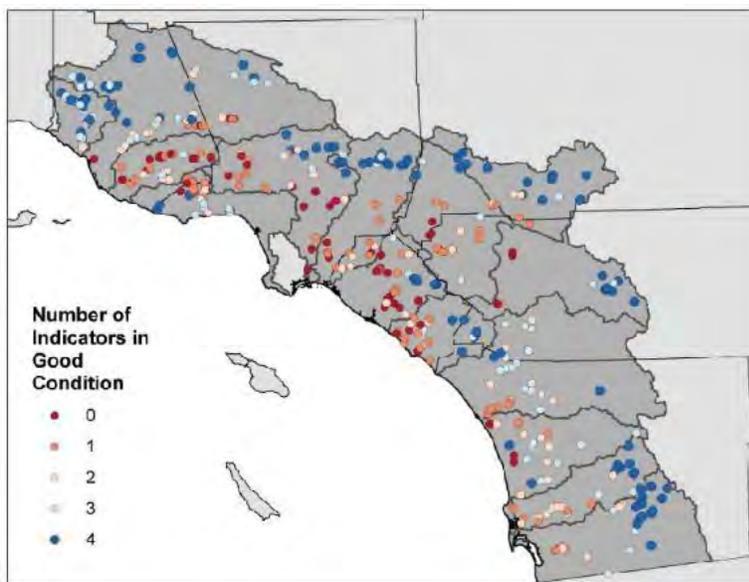
Since the initiation of the SMC perennial stream survey in 2009, stormwater agencies have been able to coordinate their monitoring efforts with regulatory agencies, reallocate resources, and

generate the needed data in a cost-neutral way, while simultaneously allowing regulated agencies to fulfill their permit obligations. This survey serves as the regional component of the statewide Perennial Stream Assessment, allowing both the SMC and the State Water Resources Control Board to leverage resources and support each other's surveys.

To answer key management questions, over 500 sites were sampled for four key indicators of biological condition: benthic macroinvertebrates, diatoms, soft algae, and riparian wetlands. These indicators were used to assess the biological health of over 7000 km of streams. In addition, water chemistry, water column toxicity, and physical habitat were examined in order to identify stressors affecting biological conditions in the region. Furthermore, because the survey spanned five years, initial estimates of regional trends are now possible.

Key Findings

Biologically healthy perennial streams are a scarce resource, comprising only 25% of perennial wadeable stream-miles in the region. Based on four biological indicators (i.e., benthic macroinvertebrates, diatoms, soft algae, and riparian wetlands), perennial streams in good biological condition (i.e., scores above the 10th percentile of reference sites) were largely confined to undeveloped portions of watersheds; most indicators identified slightly better conditions at agricultural streams relative to urban streams. Ventura, Santa Clara, Upper Santa Ana, and Southern San Diego watersheds were in better condition than other watersheds for most indicators, whereas perennial streams in poor condition (i.e., scores below the 10th percentile of reference sites) were most extensive in Calleguas, Los Angeles, San Gabriel, and Lower and Middle Santa Ana watersheds.



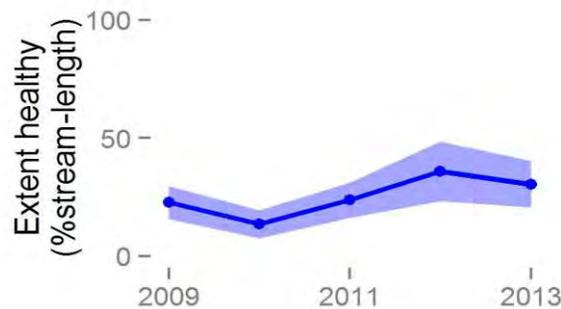
Perennial stream condition was evaluated with four biological indicators: benthic macroinvertebrates, diatoms, soft algae, and riparian condition. In general, these components of the stream community rarely indicated good health in developed portions of watersheds.

Nutrients, sulfates, and habitat degradation were extensive, high-risk stressors associated with poor biological condition. Future investigations should consider these possible candidate stressors as potential causes of poor biological condition. In contrast, metals, pyrethroids, and toxicity were either rarely above threshold or weakly associated with biological condition.

A large extent of the South Coast region was at risk from physical habitat degradation, elevated nutrients, and major ions. Pyrethroids and metals were either weakly or rarely associated with poor health.

Very high priority (Affects more than 25% of region)	High priority (Affects more than 10% of region)	Moderate or low priority (Limited extent or low risk)
Nitrogen	Chloride	Pyrethroids
Phosphorus	Suspended solids	Metals
Physical habitat	pH	Biomass
Sulfates		Toxicity
Dissolved solids		

No changes in biological condition were detected. Although mean condition estimates fluctuated from year to year, conditions in 2013 were similar to those observed in 2009; fluctuations were primarily driven by variability in undeveloped streams, as urban streams were consistently in poor condition, varying little from year to year. At no time during the survey were more than 35% or less than 14% of streams estimated to be intact for all indicators. Moving forward, the ability to detect trends could be improved by minor changes to the study design, such as revisiting sites over several years and by extending the survey for additional years.



Extent of perennial streams in good biological condition for all four indicators (benthic macroinvertebrates, diatoms, soft algae, and riparian condition) fluctuated from year to year, but was always limited to less than 35% of perennial stream-miles in the region. The band indicates the 95% confidence interval.

How can this survey support management decisions?

Evaluate steps to protect healthy streams and improve unhealthy streams. Given the small extent of healthy perennial stream-miles in the southern California, protecting such streams may be a priority for resource managers. Additionally, the relatively large extent of stream-miles in poor condition suggests that managers will need to prioritize actions to address stressors affecting unhealthy streams. Prioritization should focus on likelihood of success, achievability of objectives, breadth of impact, and costs associated with management activities, as well as local objectives and needs for each waterbody. Although most of the actions required will be site-specific, a regionally coordinated approach will aid in priority ranking and enable leveraging of efforts across sites or watersheds.

Use regional context in site-specific evaluations. The primary application of survey data is to provide context in evaluating site-specific questions. Comparing the condition of a specific site to conditions at sites with similar land use within the region may provide more useful benchmarks for management objectives than comparison to reference sites, which may not provide an achievable management objective.

Use survey data in causal assessments to identify candidate stressors. Because of the breadth of information collected at each site, the comparability of methods used, and the diversity of sites sampled, data from this survey are well suited to causal assessment applications. With some investment in tool development, regional watershed managers will be able to overcome the data limitations (such as difficulties in identifying comparison sites with information on stressors) that often hinder effective causal assessments.

Recommendations for future monitoring

Although this survey successfully produced preliminary answers to key questions, important knowledge gaps remain. Continuing the survey with modifications will address these gaps.



Include stream types that were previously excluded from the survey. The chief limitation of this survey is that it was restricted to perennial, wadeable streams, 2nd order and higher. The condition of nonperennial and headwater streams represents the largest gap in our regional assessment. Perennial streams account for only 25% of stream-miles in the region as a whole, and as little as 5% in certain watersheds; this variation is caused by both natural factors (such as climate) and land use. Because

perennial and higher-order streams are more abundant in developed regions, it is likely that the surveyed portion of the region is in worse condition than the region as a whole. Expanding the survey to include assessment of nonperennial streams (approximately 59% of stream-miles in the region), and exploring ways to map them will help fill these knowledge gaps. Existing

assessment tools may be appropriate to assess condition of nonperennial streams, and new tools should be developed as needed.

Improve trend detection through site revisits. Probabilistic sites that are revisited for several years can be used to estimate the extent of improving, degrading, or stable streams in the region. Additionally, management practices associated with changes in conditions can be identified.

Use survey data and special studies to support causal assessments and investigate high-priority stressors. Stressor prioritizations are strictly associative and cannot identify with certainty causal relationships between stressors and biological condition. In some cases, stressors that were identified as high priority (e.g., nutrients) might not directly affect biological condition. Instead, the high risk may reflect a correlation with an unmeasured stressor. The frequent co-occurrence of multiple stressors can make it difficult to disentangle the relationships between individual stressors and biological condition. The SMC can address these limitations in several ways:

- Analyze existing data to explore the diagnostic potential of biological indicators to identify specific stressors.
- Enhance the stream survey with new indicators related to habitat degradation (e.g., hydromodification indicators) or nutrient enrichment (e.g., continuous water quality loggers, algae biomass), or other stressors of emerging concern (e.g., sediment pyrethroids).
- Conduct special studies to distinguish biological constraints imposed by habitat degradation, channel engineering, water chemistry, and natural factors.

SURVEY OVERVIEW



This survey provides the best estimate of the extent of perennial (e.g., Big Tujunga Creek, upper photo) and nonperennial streams (e.g., San Juan Creek, lower photo) in the South Coast region.

Introduction

Southern California's coastal watersheds contain important aquatic resources that support a variety of ecological functions and environmental values. Comprising over 7,000 stream-kilometers, both humans and wildlife depend on these watersheds for habitat, drinking water, agriculture, and industrial uses. In order to assess the health of streams in these watersheds, the Stormwater Monitoring Coalition (SMC), a coalition of multiple state, federal, and local agencies, initiated a regional monitoring program in 2009. Using multiple indicators of ecological health, including benthic macroinvertebrates, benthic algae, riparian wetland condition, water chemistry, water column toxicity, and physical habitat, the SMC has led the first comprehensive assessment of southern California's watersheds based on a probabilistic survey design. Through the re-allocation of permit-required monitoring efforts, the SMC has developed a cooperative sampling program that is efficient and cost-effective for participants. This report represents a summary of data collected in the first five years of the SMC's stream survey. Data from previous surveys, such as the Environmental Protection Agency (EPA) Environmental Monitoring and Assessment Program (EMAP) and California's Perennial Stream Assessment (PSA), are included as well.

The SMC monitoring program was designed to address three main questions:

- 1) What is the biological condition of perennial streams in the region?
- 2) What stressors are associated with poor condition?
- 3) Are conditions changing over time?

The first question is addressed by estimating the extent of biologically intact streams, as determined by key biological indicators. The second question is addressed by estimating the extent of streams with stressors above key thresholds, and by associating stress levels with biological indicators through correlation and relative risk analyses (Van Sickle *et al.* 2006). The third question is addressed by comparing condition across years of the survey.

Regional assessments provide critical information to complement site-specific monitoring at sites of interest. Regional surveys that use a probabilistic design provide statistically valid and unbiased assessments of large geographic areas (Gibson *et al.* 1996). Crucially, regional assessments provide context to site-specific problems and allow sites to be prioritized for protection or restoration (Barbour *et al.* 1996). Furthermore, regional assessments provide a comprehensive perspective on reference conditions (Reynoldson *et al.* 1997). Although regional programs do not replace the need for monitoring at sites of interest (such as below discharges or within sensitive wildlife areas), the context provided by a regional assessment is essential for effective watershed management (Barbour *et al.* 1996, Gibson *et al.* 1996).

Methods

Study Area

Coastal southern California (i.e., the South Coast) is a semi-arid region with a Mediterranean climate, which experiences nearly all of its precipitation as rainfall during winter months. Lower elevations are characterized by chaparral, oak woodlands, grasslands, and coastal sage scrub. The region is bordered by the Transverse Ranges to the North, and the Peninsular Ranges to the East, and continues to the Mexican border to the South. Both Transverse and Peninsular ranges contain peaks that exceed 10,000 feet and regularly experience snow, although contributions to stream flow are limited. Much of the higher elevations are undeveloped and remain protected in a network of national, state, and county parks and forests. The lower elevations have been largely urbanized or converted to agriculture. Wildfires and drought are frequent in the region, with extensive fires occurring in 2007, 2009, and 2013 throughout much of the area. By area, the overall region is 59% undeveloped open space, 28% urban, and 13% agricultural (National Oceanic and Atmospheric Administration (NOAA) 2001).

Survey Design

The target population of the survey was defined as perennial, wadeable second-order and higher streams located in the six southern California counties draining into the Southern California Bight. The study area was divided into fifteen management units (hereafter referred to as watersheds) based on a combination of hydrologic and political boundaries (Table S-1, Figure S-1). The National Hydrography Dataset Plus stream network (NHD Plus; US Geological Survey and US Environmental Protection Agency 2005) was used as the sample frame. Stream segments in the NHD Plus typically represent lengths of streams between two confluences, although particularly long reaches are often split into shorter lengths. In order to assign land-use to each segment of the NHD Plus frame, a 500-m buffer was drawn around each stream segment and overlain in a GIS onto a landcover layer (NOAA 2001). If the buffer was more than 75% natural or open land, the segment was considered open space; if not, it was considered urban or agricultural, depending on which land use was relatively more dominant. Very short segments were occasionally hand corrected if the buffers were too small to adequately capture the adjacent land use; these corrections were most typically used for segments representing individual channels in complex braided systems, such as the mainstem of the Santa Clara River.

The study employed the “master list” approach to integrate sampling efforts by multiple agencies and to facilitate collaboration with other monitoring programs (Larsen *et al.* 2008). A master list was generated, containing over 50,000 sites randomly distributed across the entire stream network using a spatially balanced generalized random-tessellation design (Stevens and Olsen 2004). Sites were then assigned to a watershed using a geographic information system (GIS). Sites were attributed with Strahler stream order from the NHD Plus dataset, and with land use based on the designation of the stream segment, as described above. Sites were then attributed with watershed, stream order, and land-use of the corresponding stream segment of the sample

frame. First order streams were excluded from the survey, because these sites typically have a higher rejection rate based on nonperenniality or inaccessibility in mountainous regions. A target sample of 30 sites was selected from each watershed, with heavier representation in relatively uncommon strata (e.g., agricultural streams) to improve balance among the sampled stream types. Large oversamples (ranging from 5x to 20x) were selected as well because of high rejection rates in certain strata. Sites in the sample draw and oversamples were distributed to field crews for evaluation for sampling suitability.

Sites were evaluated for sampling using both desktop and field reconnaissance. Field crews attempted to locate a reach suitable for sampling within 300 m of the target coordinates. Sites with no nearby suitable reaches were rejected for sampling. Reasons for rejection included nonperenniality (see box below), inaccessibility (defined as sites that cannot be safely reached and sampled within one day), refusal or lack of response from landowners, map errors (e.g., no channel near the target coordinates), nonwadeability (i.e., >1 m deep for at least 50% of the reach) and inappropriate waterbody types (e.g., tidally influenced, impounded, etc.). Sites with temporary accessibility or permission issues (e.g., road closures, late responses from landowners) were re-evaluated for sampling in subsequent years.

Defining and Determining Perennial Streams

Perennial streams were defined as those with continuous flow that lasts until the end of the hydrologic year (i.e., September 30) in most years. Determining if a site met these criteria required that field crews find the best available data, including stream gauges, field indicators, historical imagery, consultation with local experts, and best professional judgment. Although all reasonable efforts were made to confirm the perenniality of the sampled sites, it is likely that some of them do not meet the survey's criteria for perennial streams during the years of the study. Therefore, the survey reflects the condition of a mixture in unknown proportions of perennial and long-lasting nonperennial streams. Development of an objective tool to characterize hydrologic regimes remains a priority research area for the SMC.

Sampling Methods

Biological Indicators

Benthic Macroinvertebrates

Benthic macroinvertebrates were collected using protocols described by Ode (2007). At each transect established for physical habitat sampling, a sample was collected using a D-frame kicknet at 25, 50, or 75% of the stream width. A total of 11 ft² (~1.0 m²) of streambed was sampled. This method was identical to the Reach-Wide Benthos method used by EMAP (Peck *et al.* 2006). However, in low-gradient streams (i.e., gradient <1%), sampling locations were adjusted to 0, 50, and 100% of the stream width, because traditional sampling methods fail to capture sufficient organisms for bioassessment indices in these types of streams (Mazor *et al.* 2010). Benthic macroinvertebrates were collected and preserved in 95% ethanol (final

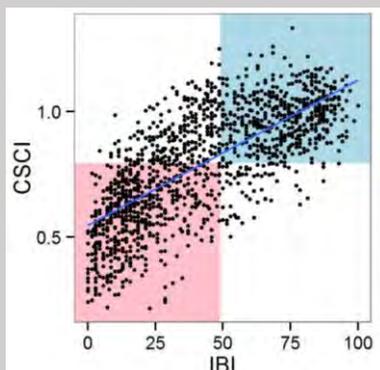
concentration 70%), and sent to one of five labs for identification. At all labs, a target number of at least 600 organisms were removed from each sample and identified to the highest taxonomic resolution that can be consistently achieved (i.e., SAFIT Level 2 in Richards and Rogers 2011); in general, most taxa were identified to species and Chironomidae (i.e., midges) were identified to genus. Benthic macroinvertebrate data was used to calculate the California Stream Condition Index (CSCI; Mazor et al. In Press). Samples from streams in reference condition are expected to have a mean CSCI score of 1.

CSCI vs. IBI

Like the Southern and Central California Index of Biotic Integrity (IBI), the CSCI was designed to measure the biological condition of streams, as indicated by benthic macroinvertebrate assemblage structure. The CSCI characterizes benthic macroinvertebrate assemblage structure in two ways: 1) As the ratio of observed-to-expected taxa (an O/E index), and 2) as a multi-metric index (MMI), where biological metrics related to important ecological attributes (e.g., number of sensitive taxa) are compared with expected values. Both components are compared to expectations that vary from site to site, and these expectations are derived from reference sites in similar environmental settings.

The CSCI was developed specifically to address some of the shortcomings of traditional indices like the IBI and provides a better measure of stream health than its predecessor because of two key features. First, the CSCI was developed with a much larger, more representative data set. For example, 473 reference sites were used to calibrate the CSCI (including 27 from lower elevation South Coast xeric sites), versus 88 for the IBI (of which only 9 were from South Coast xeric regions). More importantly, the CSCI sets biological benchmarks for a site based on its environmental setting (determined by environmental factors, like climate, geology, watershed area, and elevation) whereas the IBI makes minimal adjustments for natural environmental influences on stream communities.

Overall, the CSCI and IBI have similar performance, and samples that score high for one index usually score high for the other (Pearson's $r^2 = 0.54$). In general, the CSCI is more accurate, and is less likely than the IBI to give false indications of nonreference condition. However, it is also less sensitive, and is less likely to indicate nonreference conditions at severely stressed sites. If a threshold based on the 10th percentile of reference sites is applied to both indices (i.e., 0.79 for the CSCI and 49 for the IBI), approximately one-third of streams below the IBI threshold would be above the CSCI threshold; in contrast, only 2% of streams below the CSCI threshold would be above the IBI threshold.



Correlation between IBI and CSCI scores for sites in southern California. The pink area indicates sites where both indices suggest likely altered biological condition (i.e., Class 3 and 4), and the blue area indicates sites where both indices suggest intact or possibly altered biological condition (i.e., Class 1 and 2). The blue line represents a linear regression between the two indices.

Benthic Algae

Benthic algae samples were collected using the protocols of Fetscher *et al.* (2009), approximately 1 foot upstream of each location where benthic macroinvertebrates were collected. Diatom samples were preserved in formalin, and soft algae samples were preserved in glutaraldehyde. Unpreserved, qualitative soft algae samples were also collected to produce fruiting bodies that facilitate identification of soft algae species. Benthic algae samples were identified to the best taxonomic resolution possible, which was typically species. Benthic algae was assessed using two indices from Fetscher *et al.* (2014): a soft algae index (S2), and a diatom index (D18). Calculations were completed using custom scripts in the statistical software R. Samples from streams in reference condition are expected to have a mean D18 score of 79 and a mean S2 score of 69. Although these indices are not “predictive” like the CSCI score, little bias from natural gradients was evident at reference sites (Fetscher *et al.* 2014).

Riparian Wetlands

Riparian wetland condition was assessed using the California Rapid Assessment Method (CRAM; Collins *et al.* 2008). Briefly, the CRAM method assesses four attributes of wetland condition: buffer and landscape, hydrologic connectivity, physical structure, and biotic structure. Each of these attributes is comprised of a number of metrics and submetrics that are evaluated in the field for a prescribed assessment area. Streams in reference condition are expected to have a mean CRAM score of 84.

Water Chemistry

Field crews measured pH, specific conductance, dissolved oxygen, salinity, and alkalinity at each site visit using digital field sensors (or by collecting samples for lab analyses, where appropriate). In addition, samples of stream water were collected for measurements of 36 different analytes, including: total suspended solids, total hardness (as CaCO₃), silica, sulfate and other major ions, nutrients, dissolved and total metals, and pyrethroid pesticides. Analytical methods and quality assurance protocols are described in SWAMP QAT (2008).

Toxicity

At each site, ~4 L of water were collected for toxicity assays, primarily using the water flea *Ceriodaphnia dubia*. Six to eight day exposures to undiluted field-collected stream water were conducted, and both survival (acute toxicity as percent mortality) and reproduction (chronic toxicity as young per female) endpoints were recorded. In samples with specific conductivity ≥ 2500 $\mu\text{S}/\text{cm}$, a 10-day survival assay using the amphipod *Hyaella azteca* was used instead, with no reproductive endpoint (USEPA 2002, SWAMP QAT 2008).

Physical Habitat

At each site, physical habitat was evaluated using a physical habitat assessment as specified in Ode (2007) and Fetscher *et al.* (2009), which were adapted from EMAP (Peck *et al.* 2006). Briefly, a 150-m reach (250-m for streams over 10 m wide) was divided into 11 equidistant

transects, with 10 inter-transects located halfway between them. At each transect, the following parameters were measured: bank dimensions, wetted width, water depth in five locations, substrate size, cobble embeddedness, bank stability, microalgae thickness, presence of coarse particulate organic matter, presence of attached or unattached macroalgae, presence of macrophytes, riparian vegetation, instream habitat complexity, canopy cover using a densiometer, human influence, and flow habitats. A subset of these variables were measured at each inter-transect as well. The slope of the water surface was measured across the entire reach at each site. Metrics based on physical habitat data were calculated using custom scripts in R, based on those presented in Kaufmann *et al.* (1999).

Challenges in Assessing Physical Habitat

Although many studies point to a crucial role for physical habitat in supporting healthy streams, assessing the condition of physical habitat remains a challenge for bioassessments. There are four parts to this challenge: 1) measuring the right variables, 2) calculating meaningful metrics from these variables, 3) comparing these metrics to benchmarks that are appropriate for the environmental setting of a site, and 4) ensuring that the metrics are comprehensive enough to characterize important aspects of habitat degradation. To some extent, the first two problems have been addressed. The protocol developed by SWAMP, based on methods developed by the EPA (Peck *et al.* 2006), encompasses over 1000 individual measurements per site, and these measurements are converted into more than 150 metrics that characterize the physical habitat, again based on earlier efforts of the EPA (Kaufmann *et al.* 1999). However, most of these metrics vary widely among reference sites, based on environmental factors like climate and watershed size. Predictive models to set reference-based expectations for physical habitat metrics are in development, but are not yet available. Once such models are developed, a remaining challenge will be to select which metrics (and in which combinations) are most useful in characterizing the overall condition of the physical habitat of a site.

Landscape Variables

Landscape variables were calculated for three purposes: CSCI calculation (see Mazor *et al.* In review), reference site screening (see Ode *et al.* In review), and biological relationships. Using a GIS, watersheds were delineated for each site from 30-m digital elevation models (USGS 1999), and visually corrected to reflect local conditions. For sites draining ambiguous watersheds with minimal topography, delineations were modified using CALWATER boundaries (California Department of Forestry and Fire Protection 2004) or by consulting local experts. Watersheds were clipped at 5 km and 1 km to evaluate local conditions, creating a total of three scales (abbreviated as WS, 5k, and 1k). A fourth scale (i.e., point), based only on the site location, was used to calculate distance-based metrics. These delineations were then used to calculate metrics from source layers relating to landcover (NOAA 2001), transportation (CDFG custom roads layer, P. Ode, unpublished data), geology (J. Olson and C. Hawkins, unpublished data), and hydrology (National Inventory of Dams and NHD Plus). For sites sampled in 2013, only variables related to the CSCI were calculated.

Summary of Data from Other Surveys

Data from other surveys were included in this report, where possible. In order to be included, these surveys had to meet the several criteria: 1) benthic macroinvertebrates were collected using similar protocols (e.g., EMAP), 2) benthic macroinvertebrates were identified to equivalent taxonomic resolution, 3) survey design documentation (including stratifications) and site evaluation data were available, and 4) compatible sample frames were used for survey design (specifically, the NHD Plus or its predecessor RF3). These surveys are summarized in Table S-2. Note that some sites, although selected for sampling for a probabilistic survey, were revisited under other programs (such as reference sampling, fire studies, or other targeted designs), and these data were included in the current assessment as well. With few exceptions, limited data types (generally, benthic macroinvertebrates and physical habitat) were collected for these surveys.

Climate Data

Monthly rainfalls for stations throughout the region were downloaded from The National Oceanic and Atmospheric Administration's California and Nevada River Forecast Center (www.cnrfc.noaa.gov/rainfall_data.php). Annual totals were then calculated and plotted to evaluate the conditions during the study period relative to longer term trends. Three representative stations were selected for plotting (i.e., downtown Los Angeles, Big Bear Lake, and Lindbergh Field).

Data Analysis

Weighted Magnitudes and Extent Estimates

Adjusted sample weights were calculated for each site. Because multiple surveys with different designs were included in analysis, weights needed to be recalculated for each site. Stratification approaches from all surveys were combined to create "cross-strata" in which all evaluated sites have an equal probability of being sampled. Adjusted weights were recalculated as the total stream length within each strata, divided by the number of sites evaluated in that stratum. Strata with no evaluations were excluded from analysis. Because these strata comprised less than 2% of the total stream length, these exclusions are unlikely to affect condition estimates. These weights were used to estimate distribution points for selected variables and extents (e.g., % of stream-length in classes of interest) using the Horvitz-Thompson estimator (Horvitz-Thompson 1952). These estimates were calculated for reporting units of interest, including watersheds, land use classes, and (for trend estimates) years. Confidence intervals (CIs) were based on local neighborhood variance estimators (Stevens and Olsen 2004). All calculations were conducted using the *spsurvey* package (Kincaid and Olsen 2013) in R version 3.0.3 (R Core Team 2012).

Extent Estimates

When surveys use a probabilistic design, the data they produce can be used to make inferences about the region as a whole, and not just about sampled sites. Therefore, statements about the extent of perennial wadeable streams, or about the average CSCI score in a watershed can be made. Probabilistic surveys provide context about ambient condition, which can be used to compare against sites of interest.

The key benefit of a probabilistic survey is its ability to estimate the true extent of a resource of interest, such as perennial, wadeable streams. Sites sampled under a targeted design provide valuable information about local conditions, but cannot be used to estimate the condition of the region as a whole. Because targeted studies are typically designed to assess known impacts (e.g., downstream of discharges), the sites may be in worse condition than the average site in the region; therefore, estimates of regional condition from targeted sites may be biased.

When sites are sampled according to a probabilistic design, measurements represent not just local conditions, but also reflect conditions of a much larger population. The condition of each probabilistic site therefore contributes to condition estimates of the region as a whole. The weight (i.e., the contribution to regional estimates) of each site varies; sites in large, sparsely sampled regions (e.g., open streams) make a larger contribution to regional estimates than sites in small or densely sampled regions (e.g., agricultural streams).

Results

A total of 760 probabilistic sites were sampled in the South Coast region, of which 515 were sampled by the SMC or affiliated programs (Table S-2). To attain this sample size, 4330 unique sites were evaluated, yielding a rejection rate of 82%. The most common cause for rejecting a site was nonperenniality (75% of rejected sites), followed by physical barriers (9% of rejected sites). Determinations of nonperenniality were made during both office and field reconnaissance. Other causes for rejection (e.g., map errors, inappropriate waterbody types, nonwadeability) were infrequently encountered ($\leq 5\%$ of rejected sites; Table S-3; Figure S-2).

Analysis of rejected sites indicated large differences in the extent of perennial streams by watershed and land use. For example, perennial streams made up 53% of stream-miles in the Los Angeles watershed, but only 6% of the San Jacinto watershed (median watershed extent: 26%). Land-use was strongly associated with perenniality, as 35% of urban stream-length, but 12% of agricultural stream-length and 16% of open stream-length were perennial (Figures S-2, S-3, S-4).

Overall, the survey occurred in a drier than normal period. Rainfall during 2011 was slightly above average, although most other years were well below normal. Notably, the survey occurred shortly after one of the driest years on record (i.e., 2007), when even the rainier weather stations (e.g., Big Bear Lake) reported extremely low precipitation (Figure S-5).

Discussion

Perennial wadeable streams are a small component of the region, and protecting this limited resource may be a high priority for watershed managers, particularly because of their importance to a variety of beneficial uses (such as fisheries, wildlife, and swimming). At the same time, the need to expand attention to nonperennial streams is apparent: A comprehensive assessment of the coastal watersheds of southern California should not exclude the large extent of nonperennial streams. Ongoing research in the region addresses the question of whether the condition indices used in this survey are valid in nonperennial streams. However, it is likely that assessment tools currently available to watershed managers are adequate to include at least some portion of nonperennial streams in future surveys.

The observed extents of perennial streams in urban and agricultural areas are probably elevated by imported water sources (either as wastewater effluent or as runoff). Because nonperennial streams are so extensive in undeveloped areas, it is likely that this survey excludes many of the healthiest, least disturbed streams in the region. Therefore, although this survey provides an unbiased assessment of the perennial portion of southern California streams, extrapolation to the nonperennial portion may lead to incorrect conclusions about the health of the region as a whole.

Climatic trends may have also influenced the extent and location of perennial streams. Frequently, field crews were unable to sample reaches that were historically perennial, suggesting that long-term drought or changes in water management may have converted some perennial streams to nonperennial. The variability of flow regimes in southern California streams has been documented in special studies commissioned by the SMC (e.g., Mazor *et al.* 2014), and this variability underscores the need for a flexible approach towards characterizing stream hydrology.

The widespread conversion of streams from nonperennial to perennial (and vice versa) presents a question about setting appropriate ecological objectives. Should a converted stream be compared to perennial reference streams? Or is it more appropriate to compare them to their historical conditions? This survey used the former approach, although in certain applications, such as setting restoration objectives, different goals may be appropriate.

However objectives are set for streams with altered hydrology, managing flows may be an important tool in supporting their ecological health. The causes of elevated water flows were not investigated in this survey. In major tributaries and mainstems of large rivers, elevated flows may be driven by effluent from treatment plants managed by sanitation districts. In smaller streams, runoff may be an important driver, where flood control agencies manage stream flows. Diversions and groundwater extraction are particularly important in streams in agricultural areas. Therefore, if flow regime management needs to change to support ecological health, coordination among several agencies working under different permits may be required.

Table S-1. Characteristics of each watershed.

Watersheds	Stream Order	Area (km ²)	Total Stream Length (km)	Land Use (%)		
				Open	Agricultural	Urban
Ventura	6	642	236	68	15	17
Santa Clara	7	4327	1429	81	14	6
Calleguas	5	891	315	28	35	36
Santa Monica Bay	4	1171	200	73	2	25
Los Angeles	5	2160	519	41	1	59
San Gabriel	5	1758	487	50	0	50
Santa Ana River	6	7092	1708	49	15	36
–Lower Santa Ana	6	1253	298	36	10	53
–Middle Santa Ana	6	2135	519	38	14	48
–Upper Santa Ana	5	1721	523	64	12	24
–San Jacinto	4	1984	367	55	24	21
San Juan	4	1019	337	66	5	29
Northern San Diego	6	3640	1055	58	28	14
Central San Diego	5	1725	430	38	12	51
Mission Bay/San Diego River	5	1270	322	64	4	32
Southern San Diego	5	2355	535	80	6	14
Entire Region	7	28051	7574	59	13	28

Table S-2. Probabilistic surveys included in the study. Note that the SMC program includes sites sampled under nested programs that used the same master sample draw, such as the San Gabriel River Regional Monitoring Program, the Los Angeles Watershed Monitoring Program, and Region 4 Probabilistic Sampling; sites from these surveys were included only if they were part of the SMC's target population of second-order or higher perennial, wadeable streams.

Survey	Years	Sites
Environmental Monitoring and Assessment Program (EMAP)	2000 to 2003	42
California Monitoring and Assessment Program (CMAP)	2004 to 2007	12
National Rivers and Streams Assessment (NRSA)	2009 and 2013	1
Perennial Streams Assessment (PSA)	2008	11
Stormwater Monitoring Coalition (SMC)	2008 through 2013	515
Region 8 Trend Monitoring (R8T)	2006 through 2013	102

Table S-3. Extent (in percent stream-miles) of perennial and non-perennial streams by subpopulation.

Subpopulation	Perennial, sampled (n sampled)	Perennial, not sampled	Rejected		
			Nonperennial	Physical Barrier	Other
South Coast	20.7 (682)	2.3	58.5	10.0	8.4
<i>Land Use</i>					
Agricultural	11.9 (92)	4.0	70.7	1.2	12.3
Open	15.9 (306)	1.4	61.1	16.3	5.3
Urban	35.3 (284)	3.4	47.2	0.8	13.4
<i>Watershed</i>					
Region 4					
Ventura	25.3 (37)	0.8	62.6	7.1	4.3
Santa Clara	16.2 (94)	2.1	55.2	24.0	2.6
Calleguas	30.2 (38)	6.0	48.2	3.0	12.6
Santa Monica Bay	23.6 (72)	2.1	52.7	9.6	11.9
Los Angeles	47.1 (44)	5.6	25.3	13.2	8.8
San Gabriel	43.7 (39)	1.1	23.0	16.6	15.5
Region 8					
Lower Santa Ana	16.3 (45)	3.1	46.6	8.2	25.8
Middle Santa Ana	13.1 (57)	4.0	61.3	4.7	16.9
Upper Santa Ana	25.1 (67)	2.8	44.6	22.2	5.3
San Jacinto	5.3 (28)	0.7	77.5	8.6	7.9
Region 9					
San Juan	27.5 (30)	1.0	68.0	1.1	2.5
Northern San Diego	7.1 (36)	0.7	81.0	1.5	9.6
Central San Diego	37.1 (35)	3.1	54.3	0.5	5.2
Mission Bay and San Diego River	14.5 (29)	2.8	74.6	1.3	6.8
Southern San Diego	8.3 (31)	0.8	83.7	0.8	6.3

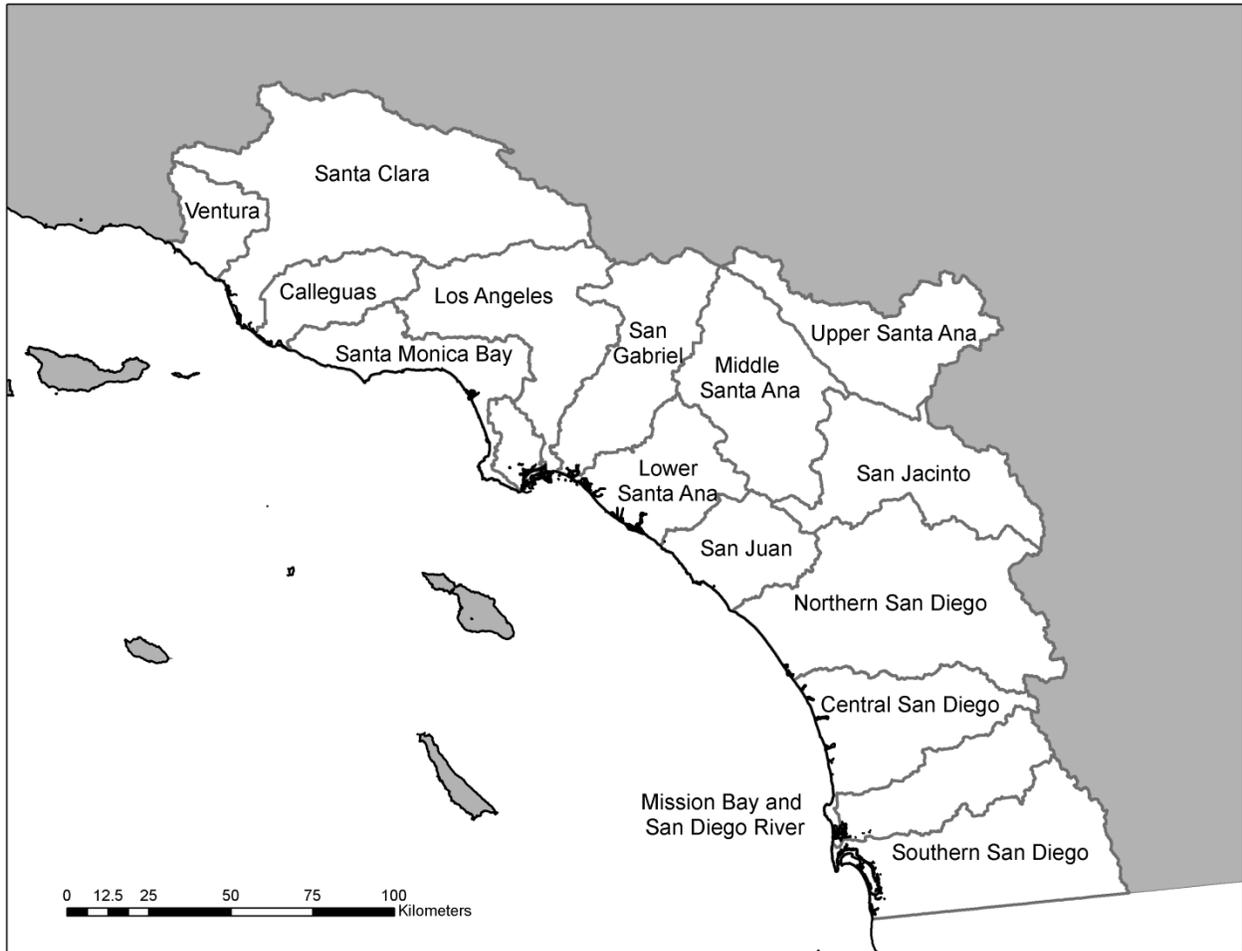


Figure S-1. Major watersheds in the South Coast survey area.

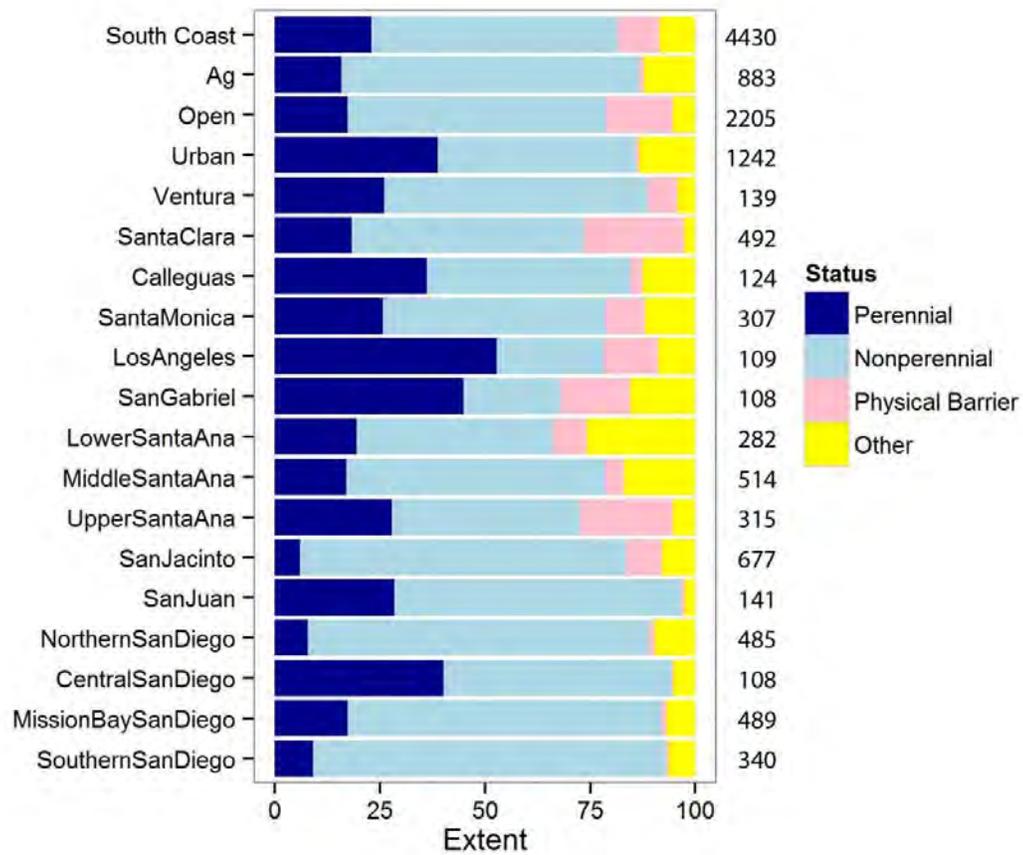


Figure S-2. Site evaluation results by watershed or land use. Numbers to the right of each bar represent the total number of sites evaluated for inclusion in the SMC and other survey.

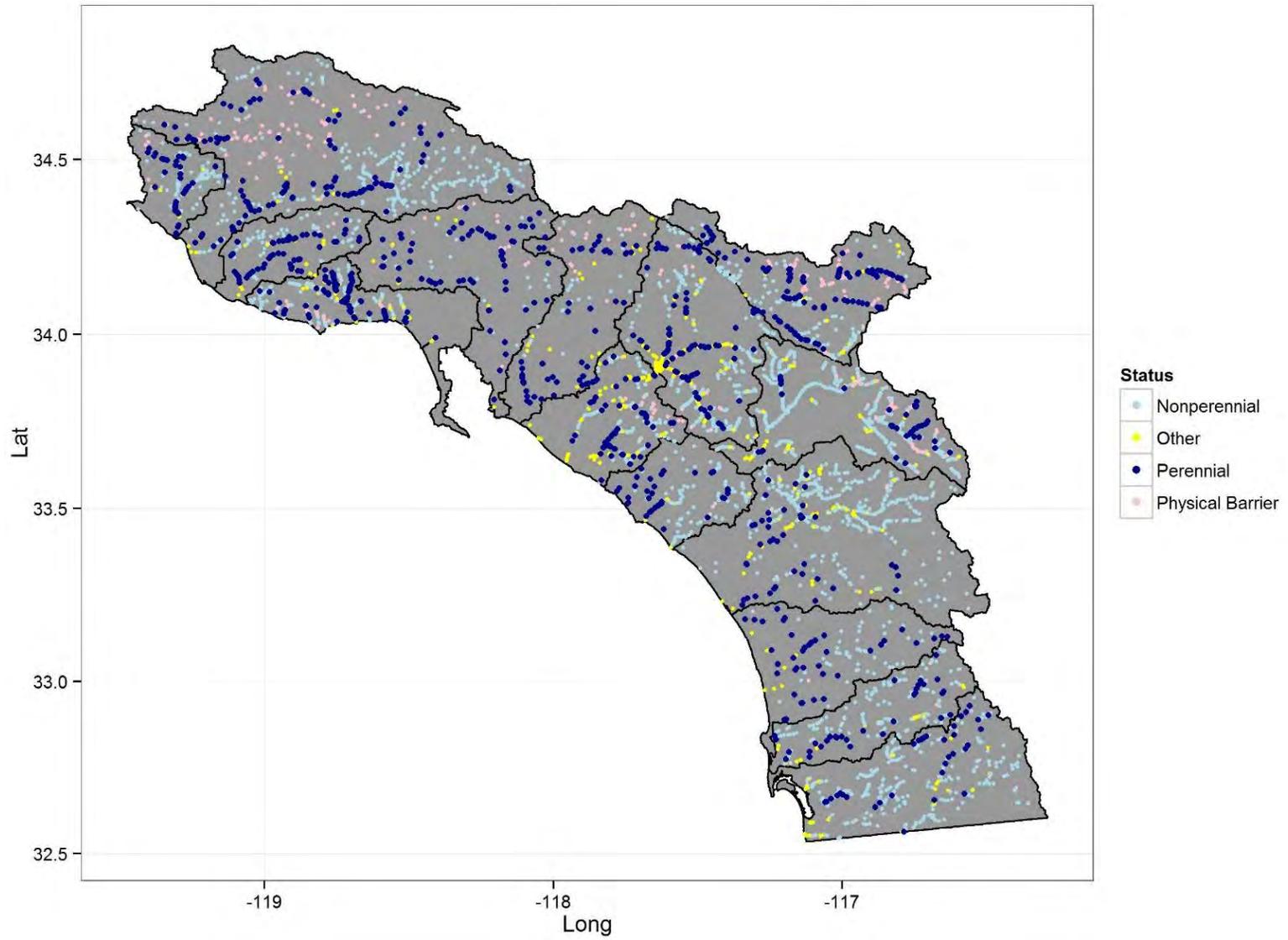


Figure S-3. Map of site evaluation results.

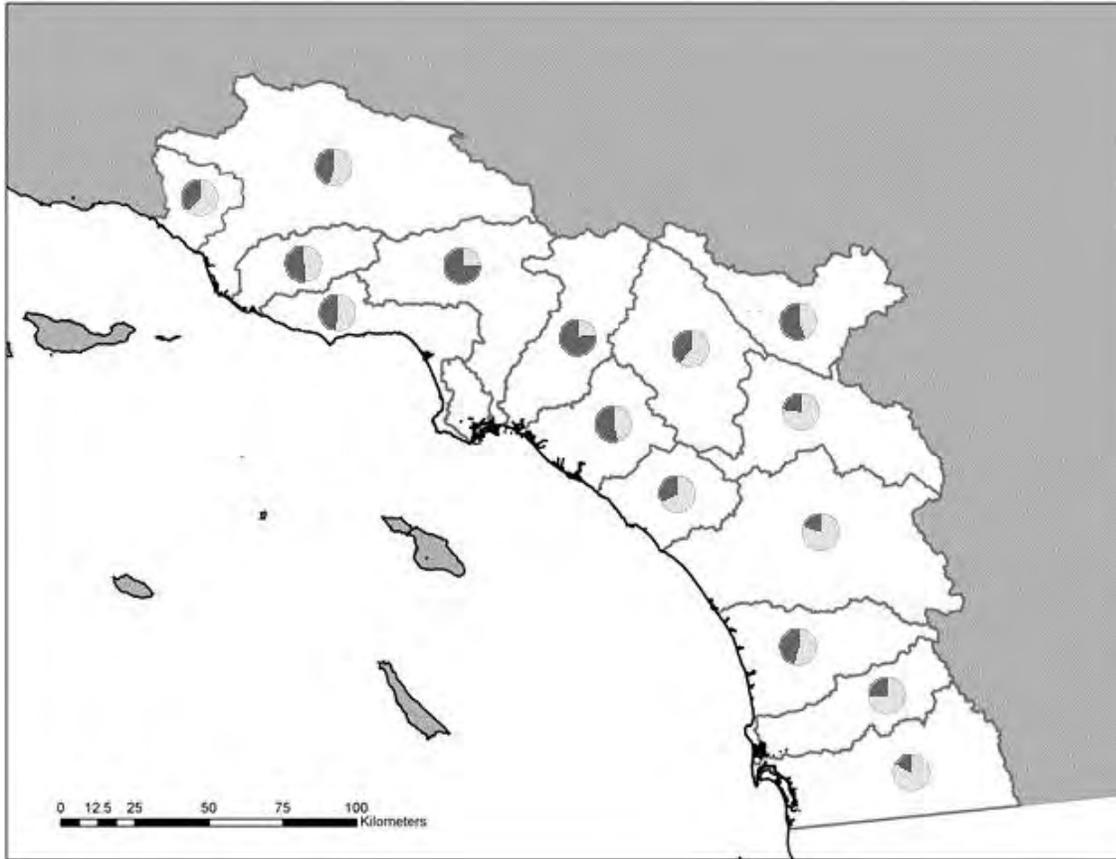


Figure S-4. Percent of nonperennial stream-miles (shown in light gray) for each watershed.

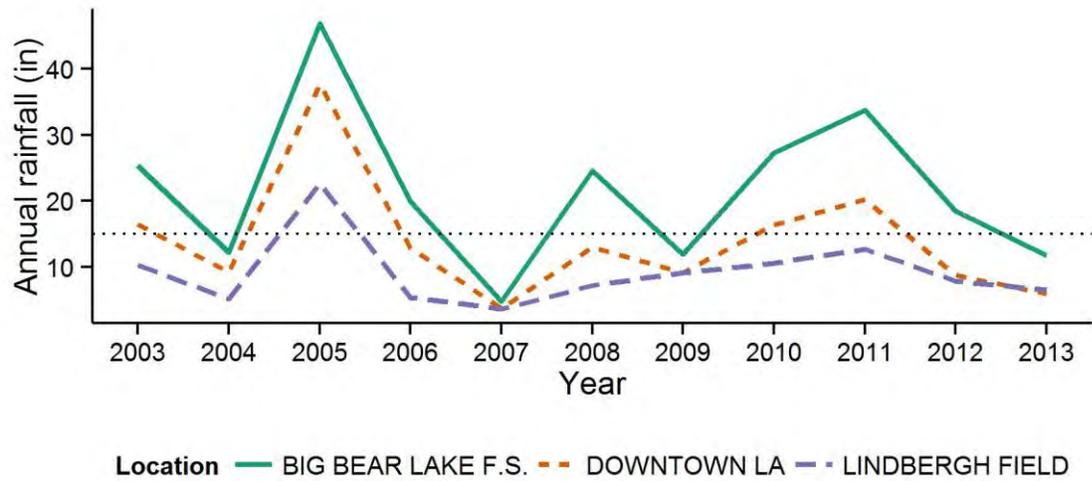


Figure S-5. Annual precipitation at three weather stations in the South Coast. The horizontal line reflects the average for downtown Los Angeles between 1877 and 2012.

QUESTION 1: WHAT IS THE BIOLOGICAL CONDITION OF PERENNIAL STREAMS IN THE SOUTH COAST REGION?



Healthy perennial streams, like this site on the North Fork of the San Jacinto River, are a scarce resource in the South Coast region.

Introduction

Surveys of ambient biological condition provide essential context for watershed management. At larger geographic scales, ambient surveys allow watershed managers to identify regional priorities. At local scales, ambient surveys allow managers to compare sites of interest to typical ranges in the region. This context informs decisions about which sites need protection or rehabilitation.

The biological condition of perennial streams was assessed by sampling four key biological indicators (i.e., benthic macroinvertebrates, diatoms, soft algae, and CRAM) at sites throughout the region, and comparing them to thresholds benchmarked to the distribution of scores at reference sites. These biological indicators provide a direct measurement of ecological health, and are an effective tool to determine if streams are supporting aquatic life or other beneficial uses. Additionally, their ability to integrate multiple stressors across both time and space make them a superior measure of biological condition to direct measures of stressors.

Methods

Data Collection

Data were collected as described in the Survey Overview.

Data Aggregation

Where multiple biological samples were collected at a single site within a year, data were aggregated as the maximum value within a site (with the assumption that index scores may be spuriously low, but not spuriously high). Multi-year mean values for each site were then calculated from these aggregated values if sites were revisited in multiple years. Missing values were ignored for all relevant analyses, where appropriate.

Thresholds

Biological indicators were compared to the 30th, 10th, and 1st percentile of reference sites (Table 1-1); these percentiles correspond to different probabilities that a score is from a site in reference condition. This approach creates four biological condition-classes that may be interpreted as indicating a stream's biology is likely intact (Class 1), possibly altered (Class 2), likely altered (Class 3), and very likely altered (Class 4). These percentiles were selected to reflect a range of conditions. Because this approach is consistent across indicators, it is possible to compare results from one index to another. Means and standard deviations were from published sources (CSCI: Mazor *et al.* In review; algae IBIs: Fetscher *et al.* 2014) or unpublished data (CRAM). Each threshold has an associated error rate; for example, 10% of reference sites are in Class 3 or 4, despite the fact that they are, by definition, intact.

Integrating Multiple Indicators

In order to determine a stream's overall condition, the four biological indicators were evaluated together to provide a comprehensive assessment of ecological health. To be considered intact for multiple indicators, all four indicators need to suggest that a stream is in reference condition. A single indicator below this threshold suggests that a stream is not in reference condition. To maintain an overall error rate of 10%, a site had to have scores above the 2.5th percentile of reference sites for each indicator (Table 1-1).

Weighted Magnitudes and Extent Estimates

Adjusted sample weights were calculated for each site. Because multiple surveys with different designs were included in analysis, weights needed to be recalculated for each site. Stratification approaches from all surveys were combined to create "cross-strata" in which all evaluated sites have an equal probability of being sampled. Adjusted weights were recalculated as the total stream length within each strata, divided by the number of sites evaluated in that stratum. Strata with no evaluations were excluded from analysis. Because these strata comprised less than 2% of the total stream length, these exclusions are unlikely to affect condition estimates. These weights were used to estimate distribution points for selected variables and extents for selected categories using the Horvitz-Thompson estimator (Horvitz-Thompson 1952). These estimates were calculated for reporting units of interest, including watersheds, land use classes, and (for trend estimates) years. Confidence intervals (CIs) were based on local neighborhood variance estimators (Stevens and Olsen 2004). All calculations were conducted using the *spsurvey* package (Kincaid and Olsen 2013) in R version 3.0.3 (R Core Team 2012).

Results

All data used in this report can be downloaded from <ftp.sccwrp.org/pub/download/SMCReport/SMCDataFor5yearReport.zip>.

Benthic Macroinvertebrates

Biological indicators suggested that most stream-kilometers in the survey's target population (i.e., perennial wadeable streams in southern coastal California) do not support healthy biology (Table 1-2a to c; Figures 1-1 and 1-2). For example, the mean CSCI score for the region was 0.77 and only 29% of stream-miles were in the top biological condition class for this indicator. Of the two components of the CSCI, the pMMI (which measures ecological structure) was more sensitive; the pMMI indicated that only 22% of South Coast stream-miles were in Class 1, whereas the O/E (which measures taxonomic completeness) indicated 46% were in Class 1.

The CSCI indicated that open streams were in better condition than agricultural streams, which were in turn better than urban streams. In fact, at open sites, mean CSCI scores were close to reference (i.e., 0.93), and only 5% of open stream-miles was in Class 4 (i.e., the worst condition class). In contrast, 31% of agricultural streams and 58% of urban streams were in Class 4.

Although this ranking of land use classes was evident with both components of the CSCI, the O/E generally categorized agricultural streams as intermediate between open and urban classes, whereas the difference was small when examined with the pMMI.

The watersheds with the greatest proportion of streams in Class 1 were located, roughly, in the northern and southern ends of the region, while the middle portions of the region had streams in poorer health. For example, the greatest extent of Class 1 stream-miles was located in the Ventura watershed (68%), followed by Southern San Diego (65%). These watersheds, along with the Santa Clara, all had mean CSCI scores greater than 0.9. The smallest extents of Class 1 stream-miles were observed in the Calleguas (9%), Central San Diego (10%), Lower Santa Ana (11%) and Middle Santa Ana (11%) watersheds.

Benthic Algae

In general, the algae indices showed similar patterns of regional stream condition as the CSCI (Table 1-2d and e; Figures 1-1 and 1-2). For example, the diatom index (D18) showed that 27% of stream-miles were in Class 1, while the soft algae index (S2) showed that 25% were in this class; these numbers are only slightly less than the estimate for the CSCI (i.e., 29%).

In contrast with the CSCI, algae-based indices only weakly differentiated between urban and agricultural streams, and estimated both to be in far worse condition than open streams. For example, D18 rarely identified developed streams as Class 1 (Agricultural: 11%; Urban: 2%). Uniquely, S2 scores were generally lower at agricultural streams (mean: 26) than urban streams (mean: 32). In contrast, mean D18 scores were similar in both urban (43) and agricultural (45) streams.

Although there were some differences among the two algae indices, they both showed that the watersheds in the northern portions of the region had the greatest extent of streams in Class 1. For example, D18 indicated the greatest extent of streams in Class 1 in the Ventura (84%) and Upper Santa Ana (63%,) watersheds, whereas S2 indicated the greatest extent of stream-miles in Class 1 in the Upper Santa Ana (47%) and Santa Clara (46%) watersheds. Depending on the index used, Class 1 streams were rarely or never observed in the Calleguas, Santa Monica Bay, Lower Santa Ana, San Juan, and Central San Diego watersheds.

Riparian Condition

Most streams in southern California did not support healthy riparian communities, as only 30% of stream-miles in the region had CRAM scores in the top condition class (i.e., a CRAM score \geq 79), and the mean CRAM score (64) was much lower than the reference mean (i.e., 84).

However, the extent of stream-miles in Class 1 was greater for individual attributes (e.g., 40% for the landscape and buffer attribute), indicating that different attributes limit overall riparian condition at different sites (Table 1-2f; Figures 1-1 and 1-2).

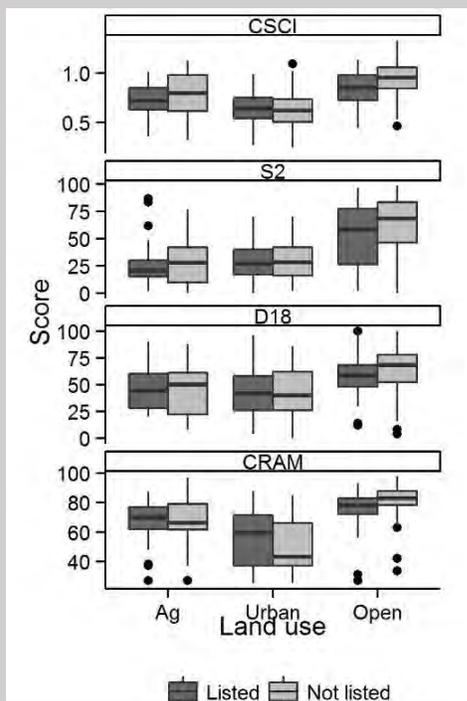
Land use was strongly associated with CRAM scores, even more so than with other indicators. For example, Class 1 CRAM scores were observed at 65% of open stream-miles (mean: 81), but only 20% of agricultural streams (mean: 68) and 7% of urban stream-miles (mean: 51). This contrast was particularly strong at the attribute level (especially the buffer and landscape attribute). For example, hydrologic conditions were in the top class at 57% of open stream-miles, but only 17% of agricultural stream-miles and 17% of urban stream-miles.

Class 1 riparian conditions were observed at the majority of stream-miles within five watersheds that were geographically dispersed across the region, with the greatest extents in the San Jacinto (63%) and Northern San Diego (57%) watersheds, followed by Ventura (54%) and Southern San Diego (52%). Streams with Class 1 riparian condition were scarce in the Calleguas (3%) and Los Angeles (14%) watersheds. Across the four attributes, four watersheds ranked among the worst in terms of the extent of streams in Class 4: Los Angeles, San Gabriel, Lower Santa Ana and Middle Santa Ana. All attributes were in the worst condition class for at least 50% of these watersheds (Table 1-2g to j) with the exception of the biotic structure attribute in the Lower Santa Ana (36% in Class 4).

303(d)-Listed Streams

The State Water Resources Control Board has designated approximately 2000 stream-kilometers in southern California as impaired for water quality pursuant to Section 303(d) of the Clean Water Act. Streams are usually listed as “impaired” due to exceedances of a chemical water quality standard. The potential relationship between designated impairments and instream biological condition was evaluated by comparing biological index scores from streams listed as impaired to streams from comparable land use categories that are not listed. Listed streams were obtained from the State Water Board 303(d) list; in Ventura and Riverside counties, agency staff modified this list by reclassifying listings believed to be unrelated to aquatic life uses (e.g., bacteria) as “not listed” for this analysis.

Land use was more strongly associated with scores than with status on the 303(d) list. For example, scores at urban and agricultural sites were lower than scores at open sites, whether or not the sites were included on the 303(d) list. There was no significant difference in scores between listed and unlisted streams at urban or agricultural sites. Scores at open listed sites were slightly lower than at open unlisted sites; however, this difference was small, and the proportion of Class 3 or 4 sites was no greater at open listed sites than open unlisted sites.



Index scores based on benthic macroinvertebrates (CSCI), soft algae (S2), diatoms (D18) and riparian condition (CRAM) for 303(d)-listed and unlisted streams, by land use.

Condition of Engineered Channels: Exploring options for alternative thresholds

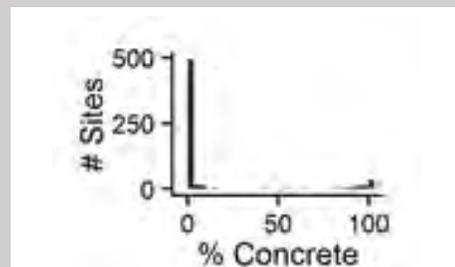
Many of the streams in this survey have been engineered to some degree for flood management purposes, and these engineered features may constrain biological condition. Therefore, we estimated the biological condition of streams with engineered channels relative to those with natural channels. The best condition observed in engineered channels may be a more realistic threshold than a reference-based threshold, assuming that the effects of channel engineering cannot be mitigated. If the best observed condition in engineered channels is substantially below a reference-based threshold, an alternative threshold may be appropriate.

Because consistently derived region-wide maps identifying the location of engineered channels are not available, habitat data was used to classify streams as likely concrete-lined (i.e., at least 5% concrete in the streambed), or likely non-concrete lined (i.e., less than 5% concrete in the streambed). This approach overlooks forms of engineered channels that do not use concrete, such as ungrouted rock, while also misclassifying streams affected by other types of concrete structures, such as road crossings. It also ignores the substantial variation of channel forms in engineered systems, which may affect biological condition. But despite these shortcomings, this approach represents a useful starting point until better data are available about engineered channels.

Overall, approximately 26% of perennial stream-miles were estimated to be concrete-lined. About half of urban streams were concrete lined and 13% of agricultural streams, but only 2% of open streams. Concrete-lined streams comprised a majority of stream-miles in the Los Angeles and San Gabriel watersheds, but none were sampled in the Northern and Southern San Diego watersheds.

Extent of concrete channels in southern California

Subpopulation	Concrete-Lined Channels	
	# sites	% stream-miles
South Coast	130	26
<i>Land use</i>		
Urban	107	53
Open	10	2
Agricultural	13	13
<i>Watershed</i>		
Los Angeles Region		
Ventura	2	4
Santa Clara	3	3
Calleguas	12	29
Santa Monica Bay	13	19
Los Angeles	22	51
San Gabriel	23	69
Santa Ana Region		
Lower Santa Ana	11	26
Middle Santa Ana	22	41
Upper Santa Ana	1	2
San Jacinto	5	19
Northern San Diego		
San Juan	6	24
Northern San Diego	0	0
Mission Bay and San Diego River	6	24
Central San Diego	4	14
Southern San Diego	0	0



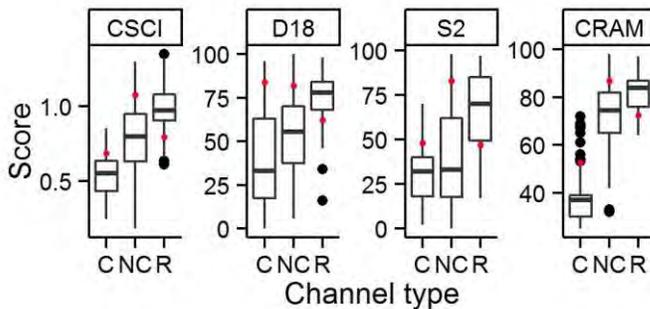
% concrete substrate at each sampled site. Concrete was absent from most sites, but comprised nearly 100% for a small handful of sites. Intermediate values were rarely observed.

Condition of Engineered Channels (Continued)

To investigate the constraints concrete lining imposes on biological condition, sites were divided into three classes: concrete-lined, no concrete, and reference. The range of index scores within each class was examined by creating boxplots. For indices where the 90th percentile of concrete-lined channels is less than the 10th percentile of reference streams, lower thresholds may be appropriate.

In general, scores of all indices were lower in concrete-lined channels than in reference streams, suggesting that these streams were typically in poor condition. For most indices the highest scores in concrete-lined channels were lower than lowest scores observed at reference sites (estimated at the 90th and 10th percentiles, respectively). For example, the 90th percentile of CSCI scores was 0.69 (i.e., “Class 3”), suggesting that an alternative threshold may reflect a more attainable management objective than the 10th percentile of reference sites. Additional data and analyses (particularly on channel type) are needed if alternative thresholds for concrete-lined channels are used for regulatory purposes.

In contrast, this analysis did not support alternative thresholds for algae indices. High scores were frequently observed in concrete-lined channels. In fact, the 90th percentile of D18 scores in concrete-lined channels was 84, which is substantially higher than the threshold based on the 10th percentile of reference sites (i.e., 62). Therefore, it is probable that low D18 and S2 scores in concrete-lined channels are attributable to impacts not directly related to channelization, and may instead be related to water quality impacts.



Distribution of scores at concrete-lined channels (C), nonconcrete-lined channels (NC), and reference streams (R). The red dot represents the 90th percentile of scores of concrete- and nonconcrete-lined channels and the 10th percentile of reference streams.

Options for setting thresholds in concrete-lined channels. A traditional approach is based on the distribution of scores at reference sites, whereas an alternative approach is based on the distribution of scores at concrete-lined channels. These numbers reflect preliminary analyses.

Index	Option 1: Threshold based on reference	Option 2: Threshold based on concrete-lined channels
CSCI	0.79	0.68
D18	62	84
S2	47	48
CRAM	72	53

Multiple indicators

Only 25% of streams-miles in the region were intact for all four indices, and these conditions were almost exclusively observed at streams with undeveloped watersheds (Table 1-3, Figures 1-3 and 1-4). Overall, 60% of open stream-miles were in this category. Streams with index scores above the multi thresholds were absent from the Calleguas watershed and scarce in Santa Monica Bay, Los Angeles, Middle Santa Ana, and Central San Diego watersheds. In contrast, a majority

of stream-miles were intact for multiple indicators in the Upper Santa Ana (62%), Southern San Diego (61%), San Jacinto (53%) and Ventura (50%) watersheds.

Most commonly, streams were limited (i.e., below the “multi” threshold) for multiple indicators, and all four indicators were identified as limiting for 15% of stream-miles region-wide (Table 1-3; Figures 1-3 and 1-4). More than a quarter of stream-miles were limited for all indicators in certain watersheds (specifically, Calleguas, Los Angeles, Lower Santa Ana, and San Jacinto watersheds) and in urban streams, but this situation was rare in other watersheds (specifically, Ventura, Upper Santa Ana, Northern San Diego, and Mission Bay and San Diego watersheds), and in open streams. Streams limited for single indicators were more extensive in these open streams, and algae indices (D18, S2, or both) were most commonly the only limiting indicator. For example, 41% of stream-miles in the Northern San Diego and 37% in the Ventura watersheds were limited for D18 or S2, but not CRAM or CSCI.

Discussion

The scarcity of streams with intact biology may prompt managers to evaluate ways to protect these streams, or improve the condition of streams where indicators suggest altered biological condition. The emphasis may vary from protection in one part of the region to rehabilitation in another, depending on local needs and interests. However, many watershed managers in southern California would benefit from a coordinated approach towards prioritizing local objectives, given the extent of streams with altered biology. Uncoordinated efforts to address pervasive challenges have historically met with little success (Bernstein and Schiff 2002).

Multiple indicators proved valuable for several reasons. 1) Redundancy improves precision and guards against incorrect conclusions from sampling error or natural variability. 2) The different life histories of each indicator provided a broader assessment of ecosystem function. 3) The unique properties of the indices increase overall sensitivity to different stressors. 4) The different responsiveness of the indices allows better discrimination among condition-classes along the biological condition gradient.

The identification of “limiting indicators” may provide initial steps towards diagnosing stressors or prioritizing sites for rehabilitation. The fact that so many streams were limited for multiple indicators (frequently all four indicators used in the survey) suggests that pressures on many streams are diverse, severe, or both, and fixing these streams may be major challenge. But 19% of the region was limited for a single indicator, and this may indicate that pressures are less severe or more similar in action; rehabilitating these streams may be a more surmountable challenge than streams with fewer indicators in intact condition.

Table 1-1. Thresholds for identifying non-reference condition for biological indicators. Ref mean: Mean of reference sites. Ref SD: Standard deviation of reference sites. Numbers in parentheses refer to the percentiles used to set boundaries between classes. “Multi” refers to the threshold used in multiple-indicator analyses (i.e., the 2.5th percentile); samples with scores above all “multi” thresholds are considered to be in reference condition, with a 10% error rate.

Index	Ref N	Ref mean	Ref SD	Class 1 (≥30 th Intact)	Class 2 (10 th to 30 th)	Class 3 (1 st to 10 th)	Class 4 (<1 st Altered)	Multi
Benthic Macroinvertebrates								
CSCI	479	1.00	0.16	≥0.92	0.79 to 0.92	0.63 to 0.79	<0.63	0.69
-pMMI	479	1.00	0.18	≥0.91	0.77 to 0.91	0.58 to 0.77	<0.58	--
-OE	479	1.00	0.19	≥0.90	0.76 to 0.90	0.56 to 0.76	<0.56	--
Benthic Algae								
D18	122	79	13	≥72	62 to 72	49 to 62	<49	54
S2	122	69	17	≥60	47 to 60	29 to 47	<29	69
CRAM								
Overall Score	86	84	9	≥79	72 to 79	63 to 72	<63	66
Buffer and Landscape	86	95	10	≥90	82 to 90	72 to 82	<72	--
Hydrologic Connectivity	86	81	13	≥74	64 to 74	51 to 64	<51	--
Physical Structure	86	81	16	≥73	60 to 73	44 to 60	<44	--
Biotic Structure	86	75	16	≥67	54 to 67	38 to 54	<38	--

Table 1-2a: Mean CSCI scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30th percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	682	0.76	0.24	29	16	23	31
<i>Land Use</i>							
Agricultural	92	0.74	0.19	20	17	31	31
Open	306	0.93	0.17	59	21	15	5
Urban	284	0.59	0.16	2	11	30	58
<i>Watershed</i>							
Region 4							
Ventura	37	0.95	0.15	68	17	15	0
Santa Clara	94	0.91	0.21	54	20	15	11
Calleguas	38	0.65	0.15	9	3	38	49
Santa Monica Bay	72	0.70	0.20	18	9	31	43
Los Angeles	44	0.70	0.23	15	23	29	33
San Gabriel	39	0.62	0.25	17	11	15	57
Region 8							
Lower Santa Ana	45	0.59	0.21	11	14	10	65
Middle Santa Ana	57	0.64	0.23	11	16	30	43
Upper Santa Ana	67	0.88	0.20	49	16	26	10
San Jacinto	28	0.72	0.19	14	24	31	31
Region 9							
San Juan	30	0.72	0.18	15	20	27	38
Northern San Diego	36	0.83	0.19	55	11	13	21
Central San Diego	35	0.72	0.17	10	17	37	35
Mission Bay and San Diego	29	0.78	0.27	33	9	25	33
Southern San Diego	31	0.91	0.16	65	19	5	11

Table 1-2b. Mean pMMI scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30th percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	682	0.68	0.25	22	10	24	44
<i>Land Use</i>							
Agricultural	92	0.62	0.17	4	16	36	45
Open	306	0.87	0.20	47	19	27	7
Urban	284	0.49	0.12	0	1	18	81
<i>Watershed</i>							
Region 4							
Ventura	37	0.83	0.22	32	26	27	15
Santa Clara	94	0.86	0.22	49	16	25	11
Calleguas	38	0.54	0.09	0	0	32	68
Santa Monica Bay	72	0.64	0.19	13	13	24	50
Los Angeles	44	0.61	0.23	10	1	35	53
San Gabriel	39	0.57	0.25	15	9	6	70
Region 8							
Lower Santa Ana	45	0.50	0.18	0	12	19	68
Middle Santa Ana	57	0.59	0.21	9	9	24	58
Upper Santa Ana	67	0.86	0.23	39	19	34	8
San Jacinto	28	0.62	0.19	12	10	27	51
Region 9							
San Juan	30	0.56	0.22	13	4	6	76
Northern San Diego	36	0.72	0.21	32	14	21	33
Central San Diego	35	0.60	0.18	10	2	34	54
Mission Bay and San Diego	29	0.72	0.27	27	10	11	52
Southern San Diego	31	0.81	0.19	41	33	9	18

Table 1-2c. Mean O/E scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30th percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	682	0.85	0.27	46	20	17	18
<i>Land Use</i>							
Agricultural	92	0.86	0.24	47	14	29	10
Open	306	1.00	0.21	71	18	7	4
Urban	284	0.69	0.23	20	23	24	33
<i>Watershed</i>							
Region 4							
Ventura	37	1.09	0.15	94	3	3	0
Santa Clara	94	0.96	0.23	67	15	11	6
Calleguas	38	0.76	0.23	21	20	45	15
Santa Monica Bay	72	0.77	0.24	28	20	35	17
Los Angeles	44	0.80	0.27	31	36	5	28
San Gabriel	39	0.68	0.28	19	25	17	39
Region 8							
Lower Santa Ana	45	0.68	0.27	22	15	32	31
Middle Santa Ana	57	0.70	0.29	28	17	21	34
Upper Santa Ana	67	0.91	0.26	60	15	8	17
San Jacinto	28	0.82	0.27	46	11	24	19
Region 9							
San Juan	30	0.87	0.18	42	33	18	7
Northern San Diego	36	0.96	0.24	70	7	17	6
Central San Diego	35	0.83	0.23	51	10	21	17
Mission Bay and San Diego	29	0.85	0.28	38	29	19	15
Southern San Diego	31	1.01	0.18	75	14	11	0

Table 1-2d. Mean D18 and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30% percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	525	53	25	27	13	18	42
<i>Land Use</i>							
Agricultural	70	45	23	11	15	27	47
Open	221	67	21	47	19	16	18
Urban	234	43	24	12	9	18	62
<i>Watershed</i>							
Region 4							
Ventura	35	79	11	84	11	4	2
Santa Clara	63	59	18	28	16	31	25
Calleguas	38	34	16	0	1	19	80
Santa Monica Bay	54	45	18	3	12	36	48
Los Angeles	40	41	26	15	13	12	60
San Gabriel	32	69	23	52	9	19	21
Region 8							
Lower Santa Ana	33	39	23	3	19	12	66
Middle Santa Ana	30	63	25	41	17	14	28
Upper Santa Ana	27	72	23	63	14	7	16
San Jacinto	21	58	25	24	37	10	29
Region 9							
San Juan	30	41	25	10	16	17	57
Northern San Diego	33	58	19	30	23	17	30
Central San Diego	29	46	23	16	8	14	62
Mission Bay and San Diego	30	56	27	28	18	17	37
Southern San Diego	30	58	22	21	32	19	28

Table 1-2e. Mean S2 scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30th percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	524	44	25	25	16	27	32
<i>Land Use</i>							
Agricultural	71	26	18	5	6	27	61
Open	217	62	24	59	13	15	12
Urban	236	32	16	2	19	35	43
<i>Watershed</i>							
Region 4							
Ventura	36	49	25	39	4	33	24
Santa Clara	60	58	27	46	16	23	15
Calleguas	38	26	15	0	13	28	59
Santa Monica Bay	54	37	24	20	19	15	46
Los Angeles	41	41	20	21	11	35	33
San Gabriel	32	49	21	26	23	27	24
Region 8							
Lower Santa Ana	33	32	22	11	10	26	53
Middle Santa Ana	30	36	16	8	13	46	33
Upper Santa Ana	26	53	28	47	10	19	23
San Jacinto	21	54	24	51	10	21	19
Region 9							
San Juan	30	45	29	27	6	35	32
Northern San Diego	33	45	26	36	15	12	37
Central San Diego	30	33	19	4	31	22	43
Mission Bay and San Diego	30	49	31	39	11	22	29
Southern San Diego	30	57	27	41	21	21	17

Table 1-2f. Mean CRAM and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30% percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	529	64	21	30	13	16	41
<i>Land Use</i>							
Agricultural	77	68	15	20	19	29	32
Open	203	81	10	65	20	12	2
Urban	249	51	18	7	7	16	70
<i>Watershed</i>							
Region 4							
Ventura	32	79	9	54	19	25	2
Santa Clara	69	76	11	48	24	16	12
Calleguas	31	57	18	3	22	17	59
Santa Monica Bay	67	64	19	25	15	22	38
Los Angeles	41	50	19	14	4	16	66
San Gabriel	37	52	22	24	6	2	68
Region 8							
Lower Santa Ana	33	56	18	11	12	20	57
Middle Santa Ana	29	52	23	24	6	4	67
Upper Santa Ana	23	74	10	34	19	30	17
San Jacinto	18	79	13	63	10	10	16
Region 9							
San Juan	31	66	21	38	6	11	45
Northern San Diego	31	81	10	57	19	21	4
Central San Diego	29	63	17	17	14	28	41
Mission Bay and San Diego	30	70	21	50	13	13	25
Southern San Diego	28	76	15	52	19	13	16

Table 1-2g. Mean CRAM Buffer and Landscape attribute scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30% percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	529	75	24	40	10	11	39
<i>Land Use</i>							
Agricultural	77	81	18	44	13	21	21
Open	203	92	13	81	12	4	4
Urban	249	62	22	10	8	14	67
<i>Watershed</i>							
Region 4							
Ventura	32	91	12	71	16	11	2
Santa Clara	69	91	12	70	13	10	7
Calleguas	31	65	21	7	15	27	52
Santa Monica Bay	67	72	26	38	8	21	34
Los Angeles	41	67	23	26	9	5	61
San Gabriel	37	68	21	27	5	0	68
Region 8							
Lower Santa Ana	33	59	26	11	12	14	62
Middle Santa Ana	29	53	28	16	0	14	69
Upper Santa Ana	23	86	23	69	8	0	23
San Jacinto	18	79	23	43	13	16	27
Region 9							
San Juan	31	71	24	33	6	10	52
Northern San Diego	31	93	8	74	12	12	2
Central San Diego	29	71	24	29	13	26	31
Mission Bay and San Diego	30	77	24	50	8	7	35
Southern San Diego	28	87	21	67	11	10	12

Table 1-2h. Mean CRAM Hydrologic structure attribute scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30% percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	529	63	21	25	18	24	33
<i>Land Use</i>							
Agricultural	77	66	15	17	28	34	22
Open	203	81	15	57	22	18	3
Urban	249	51	17	4	15	26	55
<i>Watershed</i>							
Region 4							
Ventura	32	80	15	52	26	19	4
Santa Clara	69	74	13	35	30	28	7
Calleguas	31	54	16	8	9	32	51
Santa Monica Bay	67	63	17	25	16	30	30
Los Angeles	41	52	22	20	6	22	52
San Gabriel	37	53	24	22	8	9	61
Region 8							
Lower Santa Ana	33	53	20	12	6	28	53
Middle Santa Ana	29	50	20	11	6	26	57
Upper Santa Ana	23	75	19	48	12	31	10
San Jacinto	18	76	22	58	19	0	23
Region 9							
San Juan	31	65	21	18	30	17	35
Northern San Diego	31	79	15	44	28	25	2
Central San Diego	29	65	15	12	28	41	19
Mission Bay and San Diego	30	69	19	30	28	20	22
Southern San Diego	28	78	16	46	25	22	7

Table 1-2i. Mean CRAM Physical structure attribute scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30th percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	529	56	25	38	12	15	35
<i>Land Use</i>							
Agricultural	77	59	20	32	23	20	25
Open	203	75	17	71	14	10	4
Urban	249	43	22	16	9	17	58
<i>Watershed</i>							
Region 4							
Ventura	32	76	21	65	15	16	4
Santa Clara	69	73	17	60	22	13	5
Calleguas	31	52	25	31	7	21	41
Santa Monica Bay	67	63	22	46	23	13	19
Los Angeles	41	39	20	17	1	18	64
San Gabriel	37	44	26	21	13	2	64
Region 8							
Lower Santa Ana	33	49	26	29	10	5	56
Middle Santa Ana	29	40	22	18	2	17	63
Upper Santa Ana	23	55	18	22	26	32	20
San Jacinto	18	59	22	50	0	24	26
Region 9							
San Juan	31	66	25	58	5	15	22
Northern San Diego	31	71	16	63	21	8	9
Central San Diego	29	55	20	28	11	29	32
Mission Bay and San Diego	30	64	24	50	23	2	25
Southern San Diego	28	67	17	63	10	17	10

Table 1-2j. Mean CRAM Biotic structure attribute scores and extent estimates for each condition class. n: number of sites used in the analysis. SD: Standard deviation. Class 1: % of streams with scores above the 30% percentile of reference sites. Class 2: % of streams with scores between the 10th and 30th percentiles of reference sites. Class 3: % of streams with scores between the 1st and 10th percentiles of reference sites. Class 4: % of streams with scores below the 1st percentile of reference sites.

Subpopulation	n	Mean	SD	Class 1	Class 2	Class 3	Class 4
South Coast	529	57	24	42	17	11	30
<i>Land Use</i>							
Agricultural	77	63	19	46	27	13	13
Open	203	72	17	69	19	8	4
Urban	249	45	22	22	15	13	50
<i>Watershed</i>							
Region 4							
Ventura	32	66	12	50	29	18	2
Santa Clara	69	66	16	53	24	17	6
Calleguas	31	55	20	35	30	7	28
Santa Monica Bay	67	59	19	42	28	14	16
Los Angeles	41	41	22	19	14	6	61
San Gabriel	37	42	24	24	6	9	62
Region 8							
Lower Santa Ana	33	51	23	33	8	23	36
Middle Santa Ana	29	43	26	21	13	10	56
Upper Santa Ana	23	58	24	38	25	16	22
San Jacinto	18	75	21	73	12	4	11
Region 9							
San Juan	31	63	23	52	7	16	26
Northern San Diego	31	81	13	84	14	2	0
Central San Diego	29	62	19	41	32	15	13
Mission Bay and San Diego	30	69	23	74	4	0	22
Southern San Diego	28	70	16	70	16	6	8

Table 1-3. Percent of stream-miles intact for multiple indicators, or limiting for specific indicators, for each subpopulation. Note that, in contrast to Table 1-2, these results are based on an adjusted “multi” threshold in Table 1-1, which reduces the error associated with multiple comparisons. CI: Confidence interval.

Subpopulation	n	% Intact			Indicators of Poor Condition						
		Estimate	95% CI		CSCI Alone	D18 Alone	S2 Alone	D18 or S2	All Benthic Indicators	CRAM Alone	All Four Indicators
South Coast	453	25	21	28	2	6	7	18	4	3	15
<i>Land Use</i>											
Agricultural	66	9	4	15	1	6	15	29	6	3	22
Open	172	60	51	68	4	11	10	25	1	6	0
Urban	215	2	0	4	1	3	4	10	6	0	25
<i>Watershed</i>											
Region 4											
Ventura	31	50	31	69	9	5	32	37	0	0	0
Santa Clara	51	43	30	55	5	17	6	25	1	3	7
Calleguas	30	0	0	0	0	0	12	29	11	0	32
Santa Monica Bay	47	10	3	16	5	10	6	25	10	0	12
Los Angeles	33	13	5	21	0	0	4	4	0	10	34
San Gabriel	31	28	19	37	0	0	3	3	0	3	7
Region 8											
Lower Santa Ana	32	15	7	23	0	3	6	15	0	0	46
Middle Santa Ana	25	5	0	13	4	0	7	12	3	1	13
Upper Santa Ana	19	62	42	82	0	0	0	5	9	8	0
San Jacinto	14	53	35	70	13	0	0	0	7	0	27
Region 9											
San Juan	29	18	9	27	10	7	6	13	7	0	16
Northern San Diego	31	33	4	62	2	8	23	41	9	2	0
Central San Diego	25	6	0	15	0	15	9	28	4	0	19
Mission Bay and San Diego	29	32	22	41	0	10	0	14	13	0	0
Southern San Diego	26	61	53	70	0	10	0	20	0	2	2

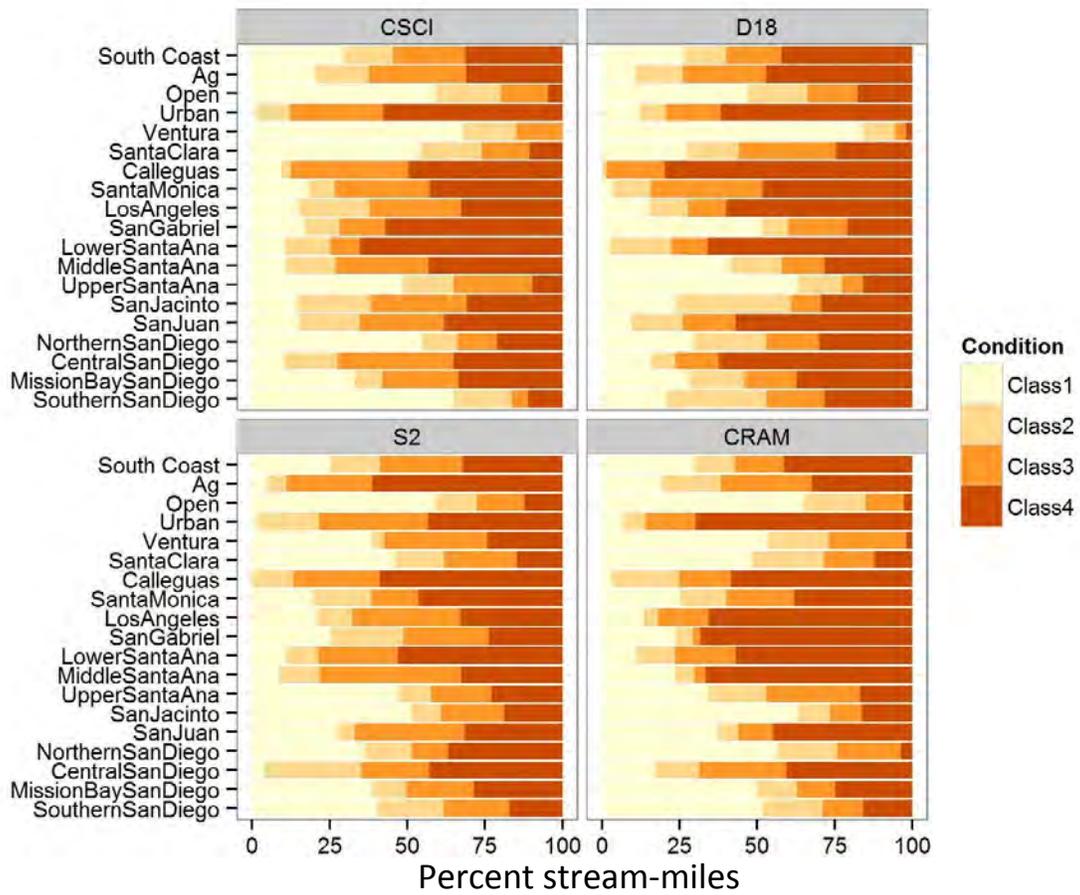


Figure 1-1. Percent of stream-miles in each condition class for each indicator by subpopulation.

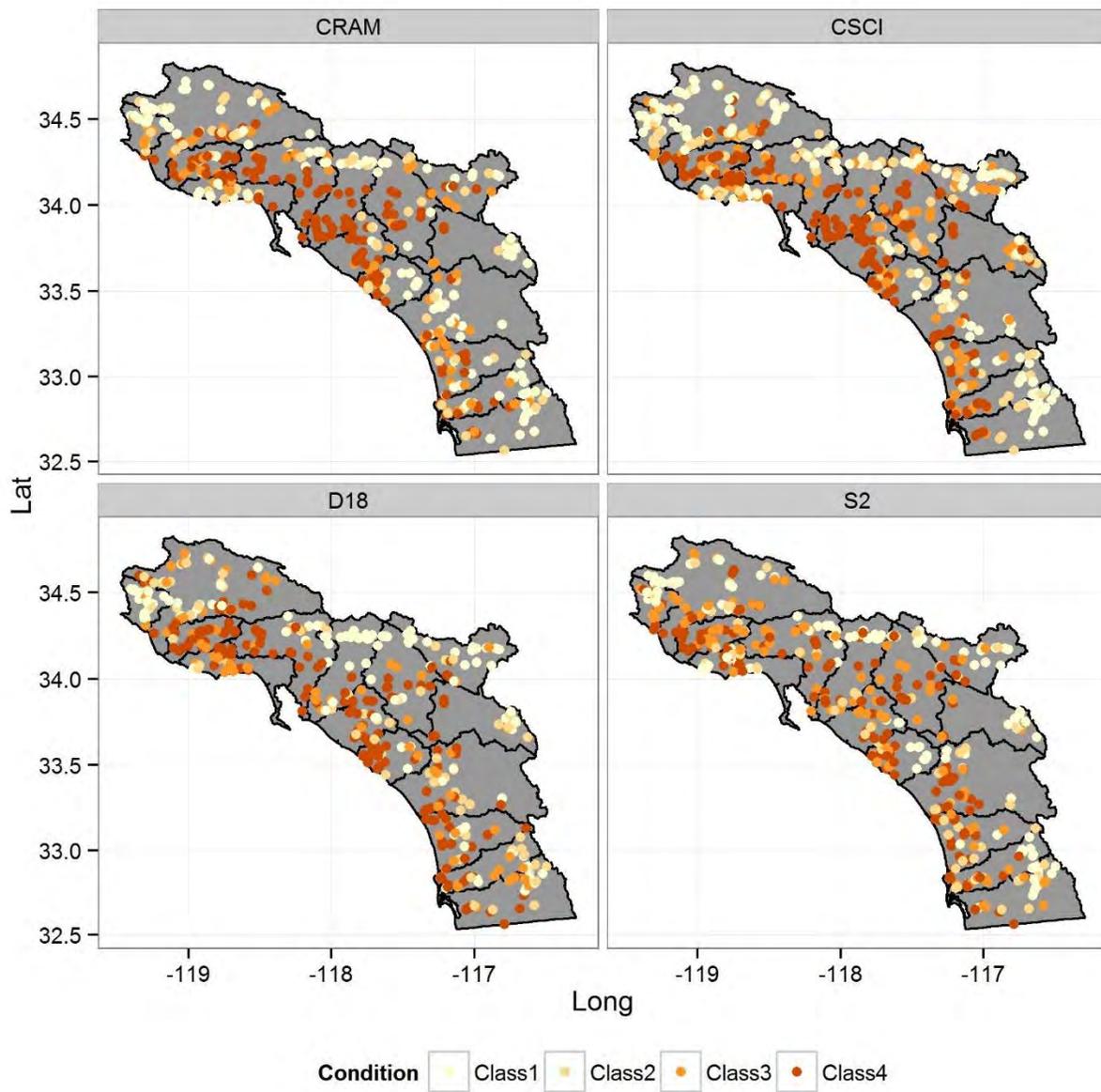


Figure 1-2. Map of scores for key indicators.

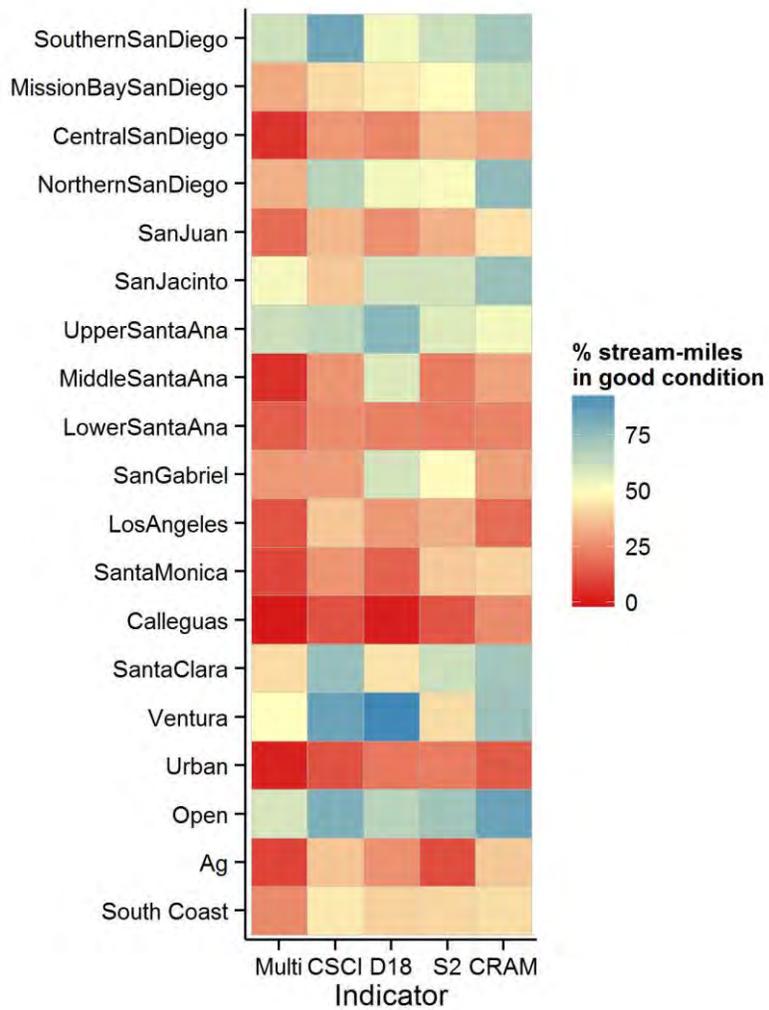


Figure 1-3. Percent of stream-miles in good condition by subpopulation. For the “multi” column, the number reflects the percent of stream-miles with scores for all indicators above the 2.5th percentile of reference sites; all other columns reflect the percent of stream-miles with scores above the 10th percentile of reference sites.

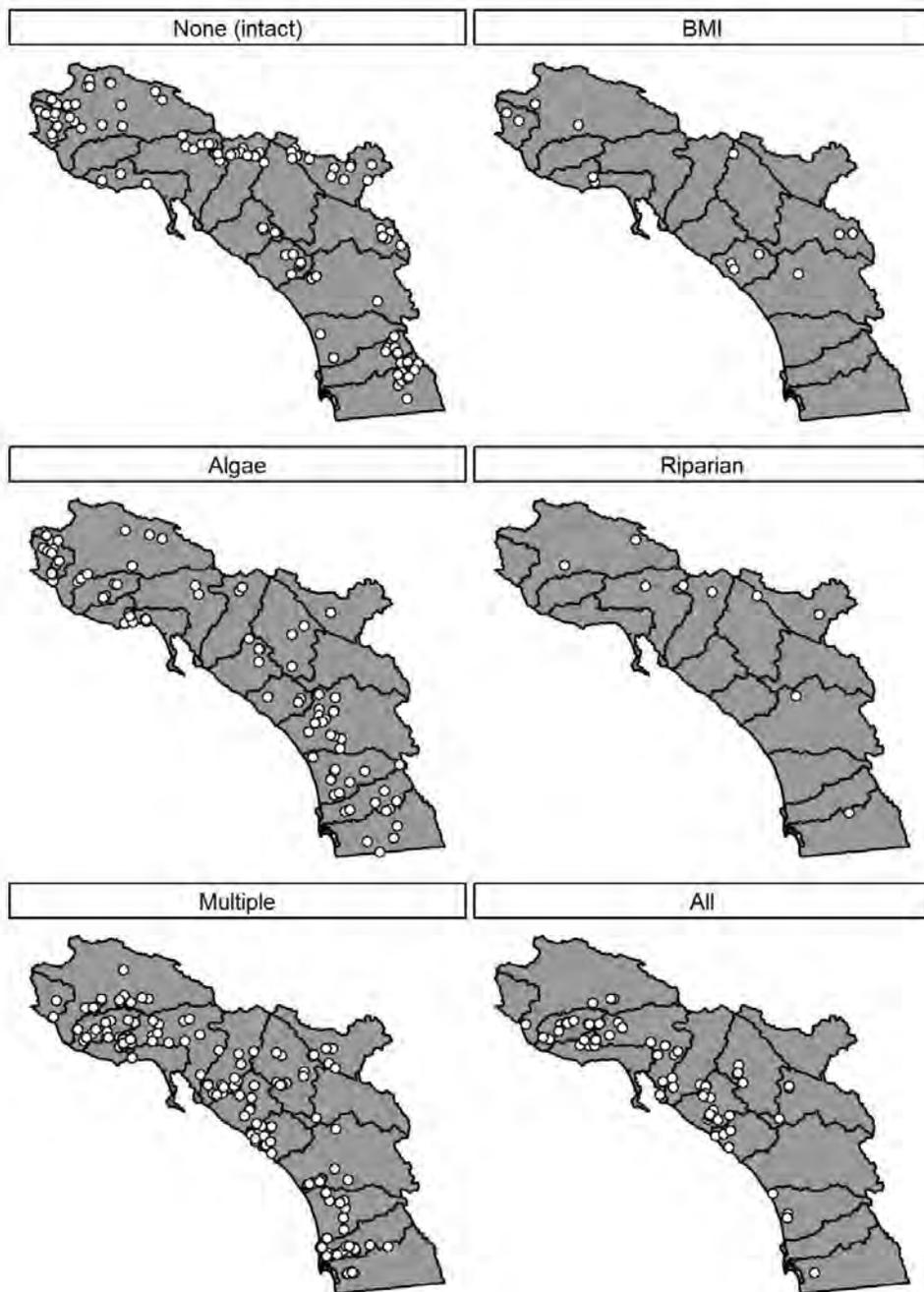


Figure 1-4. Map of limiting indicators. In the top left panel, points represent sites where scores for all four indicators above the 2.5th percentile of reference sites. For all other panels, points represent sites where scores for the specified indicator or indicators were below the 2.5th percentile of reference sites.

QUESTION 2: WHICH STRESSORS ARE ASSOCIATED WITH POOR BIOLOGICAL CONDITION?



Caballero Creek, in the Los Angeles watershed, exemplifies both the severe habitat alteration and nutrient enrichment that affects many streams in southern California.

Introduction

Although the direct measurement of stressors cannot determine the ecological health of a stream, it is essential in determining which factors may limit its health, and provides essential data to inform causal assessment at degraded sites. The SMC stream survey took a notably broad approach towards assessing stressors, measuring nutrients, total and dissolved metals, major ions, water column toxicity, and physical habitat. For some constituents, this survey represents the first unbiased estimate of the extent and magnitude of stressors in aquatic systems. By assessing the extent of these stressors and assessing their associations with biological condition, this survey allows the prioritization of stressors of regional interest, which can then inform local management decisions.

Methods

Data Collection

Data were collected as described in the Survey Overview.

Data Aggregation

Where multiple samples were collected at a single site within a year, data were aggregated as the maximum value within a site. Multi-year mean values for each site were then calculated from these aggregated values if sites were revisited in multiple years. Missing values were ignored for all relevant analyses, where appropriate.

Thresholds

Our goal in setting stressor thresholds was to prioritize stressors in terms of their associated risks to biological condition, as opposed to validating the adequacy of existing regulatory thresholds or assessing compliance with permit requirements. Therefore, the best threshold for this goal is one that is associated with the biggest change in biological condition. Stressor thresholds do not necessarily reflect the most appropriate water quality standards for a given site, which may vary based on site-specific conditions. Therefore, exceeding one of the stressor thresholds used in this analysis may not necessarily indicate impairment or noncompliance with permit requirements.

Stressor thresholds were derived from values published in relevant literature or regulations, where possible (Tables 2-1, 2-2). For chemical nutrients and for most habitat metrics (which are occur naturally and do not have regionally applicable regulatory thresholds), thresholds were established at the 90th or 10th percentile of the distribution among reference sites (as per Ode *et al.* In review). For pyrethroids without published thresholds, a threshold of zero was used.

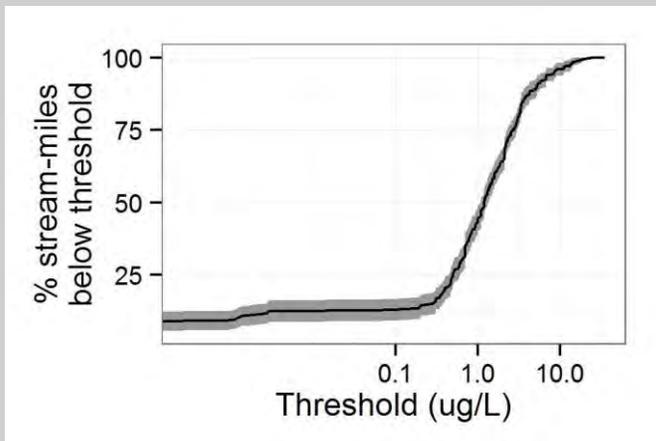
Toxicity tests were compared against controls. If endpoints were significantly different from controls and had values that were 80% of control values or lower, the samples were considered toxic. Toxic survival endpoints were given precedence over nonlethal endpoints (e.g., depressed reproduction).

Reference-Based Thresholds

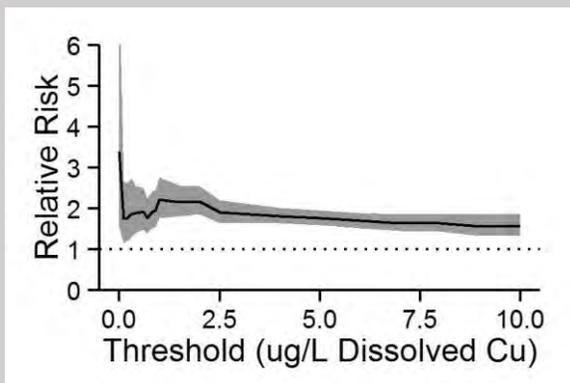
Reference-based thresholds, while appropriate for assessing whether biological indices reflect reference condition, may not be appropriate for water chemistry or physical habitat variables, as they may be excessively stringent. Because of uncertainty about the applicability of certain water chemistry thresholds, a number of alternative thresholds recommended by participating agencies were evaluated.

Copper

To evaluate the impacts of metals on stream condition, this survey used hardness-adjusted thresholds from the California Toxics Rule (EPA 2000). These thresholds are intended to prevent toxic effects on a variety of aquatic species based on the concentration of bio-available toxicants. However, because many of these metals have natural geological sources in the region (e.g., Yoon and Stein 2008), a reference-based threshold, such as those used for nutrients, would better identify sites that exceed natural concentrations. Therefore, a reference-based threshold for copper was calculated as the 90th percentile of concentrations at reference sites within the South Coast region (i.e., 3.4 ug/L), and the extent of stream-miles below this threshold was estimated. Whereas 96% of stream-miles across the region were below the hardness-adjusted threshold for total copper, only 67% were below the reference-based threshold. The difference was even greater for dissolved Copper: 99% of stream-miles were below the hardness-adjusted CTR threshold, whereas only 39% were below the reference threshold of 0.8. Relative risk estimates were only marginally affected (e.g., risk to CSCI scores went up from 1.7 to 1.9 for dissolved copper). However, attributable risks increased considerably (e.g., from 0.004 to 0.360), reflecting the larger number of stream-miles exceeding the reference-based threshold, which would have increased the priority given to this stressor.



Effects of varying thresholds on the percent of perennial stream-miles below threshold for dissolved copper. The gray band indicates the 95% confidence interval.

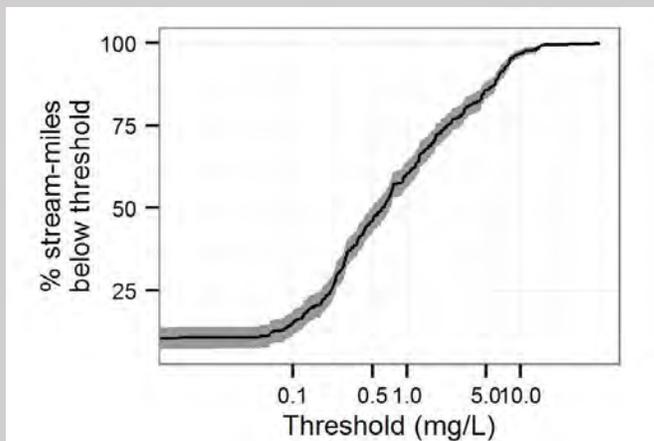


Risk to CSCI scores remain high at all levels of dissolved copper analyzed. The gray band represents the 95% confidence interval. Relative risks greater than 1 (represented by the dotted line) indicate that the stressor is associated with poor biological condition.

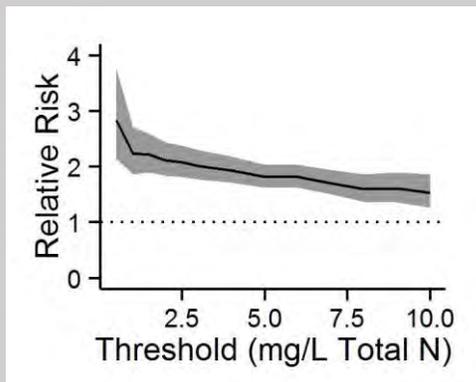
Reference-Based Thresholds (Continued)

Total Nitrogen

This study and others (see Herlihy and Sifneos 2008) have shown a strong association between nutrient concentrations and poor biological condition. However, the reference based thresholds used here are much lower than those used in basin plans or TMDLs throughout the region. For example, the reference-based threshold for total nitrogen (TN) was 0.37 mg/L, whereas the San Diego Basin Plan specifies a threshold of 1 mg/L. The Los Angeles Basin Plan sets a much higher threshold of 10 mg/L (although this threshold is explicitly linked to risks to human health and municipal water uses, not aquatic life). Although 39% of stream-miles across the region were below the reference threshold, this number increased to 60% if a threshold of 1 mg/L was used, and to 98% if a threshold of 10 mg/L was used.



Effect of varying thresholds on the percent of perennial stream-miles below threshold for total nitrogen. The gray band indicates the 95% confidence interval.



Risk to CSCI scores remain high at all levels of total N analyzed. The gray band represents the 95% confidence interval. Relative risks greater than 1 (represented by the dotted line) indicate that the stressor is associated with poor biological condition.

Stressor Extent Estimates

Extent estimates and related distribution points were calculated as described in the Survey Overview. These estimates were calculated for land use classes and for the region as a whole, but not for individual watersheds.

Stressor Associations and Prioritization

Relative risk analysis was used to estimate the likelihood of poor biological condition given the presence of a stressor, relative to the likelihood in the absence of a stressor (Van Sickle *et al.* 2006). Attributable risk analysis was then used to estimate the proportion of streams in the region where biological condition may improve if a stressor were removed. Biological condition was determined as described in the section on Question 1, except that Class 1 and 2 streams (Table 1-1) were both treated as “good”, and Class 3 and 4 streams were both treated as “poor”.

Stressors were then designated as very high priority (attributable risk > 25% of the region for any indicator), high priority (attributable risk between 10% and 25% for any indicator), moderate (attributable risk <10%, but relative risk > 1 for any indicator), and low (relative risk <1 for all indicators).

Relative and Attributable Risk

Relative risk assessment is statistical method of associating the increased risk associated with a stressor (Van Sickle *et al.* 2006). Originally developed for public health studies, relative risk analysis has become popular in environmental assessment because it facilitates prioritization of stressors by identifying which ones are most strongly associated with poor condition. Relative risk compares the odds of observing poor biological condition when a stressor is present to the odds of observing it when the stressor is absent:

$$\text{Relative risk} = \frac{\text{Proportion of stressed stream-miles in poor condition}}{\text{Proportion of unstressed stream-miles in poor condition}}$$

Stressors with relative risks greater than 1 are considered to be associated with poor condition; larger relative risks indicate stronger associations, although any stressor with a risk greater than 1 is a good candidate for further study (e.g., causal analysis).

Relative risk analysis can be extended through attributable risk analysis, which accounts for the fact that low-risk but extensive stressors may be higher regional priorities than high-risk stressors that affect few stream miles (Van Sickle and Paulsen 2008). Attributable risk is calculated as follows:

$$\text{Attributable risk} = \frac{(\text{Proportion of stressed stream-miles}) \times (\text{Relative risk} - 1)}{1 + (\text{Proportion of stressed stream-miles}) \times (\text{Relative risk} - 1)}$$

Thus, the attributable risk of a stressor is large if a stressor is extensive and has a relative risk greater than 1. If one assumes a perfect causal relationship between the stressor and poor condition, the attributable risk represents the proportion of the region that would be improved if the stressor were eliminated (Van Sickle and Paulsen 2008). But even when this assumption is violated, attributable risk is a useful metric for ranking stressors by regional importance because it accounts for both stressor extent and strength of association with biological condition.

Both relative risk and attributable risk require stressor thresholds for calculation, and modifying the threshold may alter estimates of risk. If stressor thresholds are set too high, relative risk estimates will go down as the proportion of unstressed stream-miles in poor condition increases. Similarly, if stressor thresholds are set too low, relative risk estimates will also go down as the proportion of stressed stream-miles in poor condition decreases. Ideally, stressor thresholds are set at the level where streams are most likely to switch from poor to good condition (or vice-versa), thereby allowing more direct comparisons of risk across stressors.

Results

All data used in this report can be downloaded from <ftp.sccwrp.org/pub/download/SMCReport/SMCDataFor5yearReport.zip>.

Stressor Extents

Regional results for all analytes are presented, but only subpopulations where at least 5% of the stream-miles exceeded the threshold are included.

Water Chemistry

In general, nutrients and sulfate exceeded the threshold in extensive portions of the region, while exceedances of pyrethroids and metals were rare (Table 2-3a, Figures 2-1 and 2-2). For example, total Nitrogen exceeded the reference benchmark of 0.37 mg/L in 61% of stream-miles

across the region, and sulfates exceeded the benchmark of 250 mg/L in 45% of stream-miles. In contrast, Bifenthrin, the most commonly detected pyrethroid, exceeded the benchmark of 0.0006 ug/L in only 16% of stream-miles, and Selenium exceeded the threshold of 5 ug/L in only 13% of stream-miles. Even within urban areas, pyrethroid and metal exceedances were observed in fewer than 24% of stream-miles (Table 2-3b). Several analytes (e.g., Alkalinity, Arsenic, Nickel, and Zinc) were within thresholds at all sites in the survey. Nonetheless, exceedances of certain constituents were extensive in individual watersheds (Table 2-3c). For example, Bifenthrin exceeded the benchmark in 35% of stream-miles in the Santa Monica Bay watershed, and 30% of the Lower Santa Ana, whereas Selenium exceeded its threshold in 40% of the Calleguas and 55% of the Santa Monica Bay watersheds. Geographic clustering of exceedances was evident for both Selenium and Chloride (Figure 2-2), suggesting a localized (perhaps geological) source for these constituents. Exceedances of the reference-based threshold for total dissolved solids (TDS; i.e., 498 mg/L) were also widespread, affecting 76% of stream-miles region-wide, and nearly all agricultural (97%) and urban (99%) stream-miles. However, a large extent (50%) of open stream-miles also exceeded this threshold, as did 100% of certain watersheds (i.e., Calleguas, Santa Monica, and Lower Santa Ana).

With the exception of Ammonia (whose threshold is based on its toxicity to aquatic invertebrates), nutrients frequently exceeded their benchmarks, based on concentrations observed at reference sites, and these extents were closely related to land use. For example, 71% of open streams were below the threshold for total nitrogen (TN), yet only 12% of urban and 13% of agricultural streams had similarly low concentrations of nitrogen. Exceedances for TN were relatively limited in the Ventura (26%) and Santa Clara (30%) watersheds, but pervasive within the Calleguas (94%) and Lower Santa Ana (90%) watersheds. Total phosphorous (TP) exceedances exhibited similar patterns. For example, 57% of stream-miles exceeded the reference-based benchmark of 0.03 mg/L. As with nitrogen, phosphorous exceedances were pervasive in urban (83% of stream-miles) and agricultural (72%) land uses, and were relatively common in open streams (29%).

Toxicity

Toxicity was detected in surprising geographic patterns. Sublethal toxicity (i.e., depressed reproduction) was somewhat common (evident in 25% of stream-length), and was more extensive in open (33%) than agricultural (30%) or urban (19%) streams (Table 2-4, Figure 2-3). Sublethal toxicity was particularly extensive in the Los Angeles (57%) and Santa Clara (49%) watersheds, but rare within neighboring watersheds, like the San Gabriel (6%) and Calleguas (8%) watersheds. In contrast, toxicity to survival endpoints was evident in only 6% of streams region-wide, and was less extensive in open streams (2%) than urban (8%) or agricultural (15%). Lethal toxicity was most extensive in the Central San Diego watershed (26%), but was fairly limited (extent <10%) in most other watersheds.

Physical habitat

Region-wide, the majority of stream-miles were within the reference distribution for all habitat variables examined, although the more aggregated measures of habitat condition tended to show the most extensive alteration (Table 2-5). For example, the three diversity metrics (i.e., Shannon_Flow, Shannon_Habitat, and Shannon_Substrate), as well as the fish cover metric (i.e., XFC_NAT_SWAMP) were depressed for more than 25% of stream-miles in the region (Figures 2-4 and 2-5).

With the exception of algal biomass variables, the extent of open streams exceeding a benchmark was typically close to the expected distribution at reference sites (i.e., 10%). For example, the Shannon flow metric was outside threshold in 32% of urban stream-miles, 20% of agricultural stream-miles, and only 7% of open stream-miles. This pattern, with the greatest extent of streams exceeding thresholds in urban, followed by agricultural streams, was typical of most habitat variables. A notable exception includes variables directly related to fine sediment (e.g., % sands and fines (PCT_SAFN) and % cobble embeddedness (XEMBED)) were more extensively above threshold in agricultural streams than in urban streams; these metrics may reflect channelization or other flood-control activities that reduce particulate substrates (such as cobbles and sand grains) in urban streams.

Biomass variables frequently exceeded reference-based thresholds across different land-use types, including undeveloped streams. For example, macroalgae cover (i.e., PCT_MAP) exceeded the threshold in 42% of urban streams, 31% of agricultural streams, and 17% of open streams. In contrast, variables related to habitat complexity or riparian vegetation showed a more familiar pattern across land use types.

The extent of altered habitat varied widely by watershed. For example, the extent of exceedances of biomass thresholds was about a third or less for most watersheds, with the notable exception of benthic Chlorophyll a and ash-free dry mass, where exceedances affected nearly two-thirds of the Santa Monica Bay watershed. The exceedances of the Shannon habitat metric affected 3% or less of the Ventura and Northern San Diego watersheds, but more than half of the Los Angeles, San Gabriel, and Middle Santa Ana watersheds. In fact, exceedances affected more than 50% of these three watersheds for many habitat variables.

Stressor prioritization

Nutrients, variables related to ionic concentration (e.g., TDS, sulfates), and several habitat variables were classified as very high priority stressors, having both high relative and attributable risks for several indicators (Tables 2-6 and 2-7, Figure 2-6). For example, TN had an attributable risk of 0.51 for the CSCI. Total dissolved solids and sulfate were also high priority because of their high attributable risk for the CSCI and S2. In contrast, metals and pyrethroids were typically classified as moderate priority. Some, like Bifenthrin or copper, had comparatively high relative risks (>1.5), but because of their limited extents, were estimated to

affect less than 10% of the region. Variables related to biomass were also classified as moderate, but for the opposite reason: low risk, but extensive exceedances of threshold contributed to elevated attributable risks.

While there was general agreement among indices, risks were overall greater for the CSCI, followed by S2, with D18 showing the lowest risks. The same five stressors (TDS, PCT_BIGR, W1_HALL, TP, and TN) had the highest attributable risk for all indices. Copper and XEMBED had relatively high attributable risk for the algae indices, compared to the CSCI, which in turn had higher risk for several habitat complexity measures (e.g., Shannon_Substrate, XPCMG).

Discussion

Nutrients, altered physical habitat, and major ions were both widespread and strongly associated with altered biology. Although metals and pyrethroids may be important stressors at specific sites, they should be considered a lower priority for regional programs (generally because they affected only a limited extent of streams).

Although physical habitat was repeatedly identified as a high-risk stressor, it was not possible to characterize these impacts in a precise, unbiased manner. Many physical habitat variables show large site-to-site variability within undisturbed areas, reflecting the influence of environmental gradients, like watershed size, climate, and geology. Establishing site-specific benchmarks based on environmental setting would probably yield a more accurate assessment of physical habitat. Data collected at reference sites could be used to develop models that can set these benchmarks for different stream types. Additionally, integrating multiple physical habitat variables into one or more indices would probably provide a more comprehensive characterization of habitat condition than the metric-by-metric approach used here.

Why were nutrients so strongly associated with poor biology if elevated biomass, the presumed mechanism of impact, had only a moderately high risk? This apparent conflict could result from several possible reasons: 1) timing of sampling, which may miss peak algae biomass; 2) co-occurrence with other stressors (such as habitat alteration; Bernal *et al.* 2013), or 3) other mechanisms of impact, such as cyanotoxins or microcystins (e.g., Aboal *et al.* 2002). Because nutrients are such a high priority for the region, further investigation of these explanations may be warranted.

Table 2-1. Analyte threshold by category. Asterisks indicate thresholds that were used when hardness data were unavailable.

Category	Analyte	Threshold	Unit	Source
Ions	Alkalinity as CaCO ₃	20000	mg/L	EPA (1986)
Ions	Chloride	260	mg/L	EPA (1986)
Ions	Sulfate	250	mg/L	EPA (1986)
Field	pH	6.5 and 8.5		EPA (1986)
Field	Turbidity	3.8	NTU	Ref (n=47)
Field	Specific conductance	878	uS/cm	Ref (n=77)
Solids	Suspended solids	9.5	mg/L	Ref (n=65)
Solids	Dissolved solids	498	mg/L	Ref (n=19)
Metals	Arsenic	150	ug/L	EPA (2000)
Metals	Cadmium	2.2	ug/L	EPA (2000)
Metals	Copper	9*	ug/L	EPA (2000)
Metals	Nickel	2.5*	ug/L	EPA (2000)
Metals	Lead	52*	ug/L	EPA (2000)
Metals	Selenium	5	ug/L	EPA (2000)
Metals	Zinc	120*	ug/L	EPA (2000)
Nutrients	TN	0.42	mg/L	Ref (n=65)
Nutrients	Ammonia-N	1.71	mg/L	EPA 2000
Nutrients	TP	0.03	mg/L	Ref (n=64)
Pyrethroids	Allethrin	0	ug/L	Detection
Pyrethroids	Bifenthrin	0.0006	ug/L	Central Valley draft TMDL (2014)
Pyrethroids	Cyfluthrin	0.00005	ug/L	Central Valley draft TMDL (2014)
Pyrethroids	Cyhalothrin Lambda	0.0005	ug/L	Central Valley draft TMDL (2014)
Pyrethroids	Cypermethrin	0.0002	ug/L	Central Valley draft TMDL (2014)
Pyrethroids	Deltamethrin/Tralomethrin	0	ug/L	Detection
Pyrethroids	Esfenvalerate/Fenvalerate	0.003	ug/L	Central Valley draft TMDL (2014)
Pyrethroids	Permethrin	0.002	ug/L	Central Valley draft TMDL (2014)

Table 2-2. Thresholds for physical habitat variables. n: number of reference sites used to estimate reference distribution. Ref: estimated from reference distribution. RCMP: Reference Condition Monitoring Program, from Ode *et al.* (In review).

Variable	Description	Direction	Threshold	Units	n	Source
Biomass						
Chlorophyll_a	Benthic chlorophyll a	Increase	56	ug/cm ²	66	Ref
AFDM	Benthic ash-free dry mass	Increase	37	mg/cm ²	64	Ref
PCT_MAP	% macro-algae cover	Increase	41	%	49	Ref
XMIATP	Mean microalgae thickness (where present)	Increase	1.0	mm	53	Ref
PCT_MIAT1	% thick (>1 mm) microalgae cover	Increase	18	%	53	Ref
PCT_MCP	% macrophyte cover	Increase	37	%	49	Ref
PCT_CPOM	% coarse particulate organic matter cover	Increase	71	%	60	Ref
Instream habitat						
XFC_NAT_SWAMP	Natural fish cover	Decrease	18	%	73	Ref
Shannon_Habitat	Fish cover diversity	Decrease	1.1		73	Ref
Shannon_Flow	Flow habitat diversity	Decrease	2.4		61	Ref
PCT_FAST	% fast-water habitat	Decrease	7	%	61	Ref
Riparian						
XCDENMID	% shading	Decrease	17	%	72	Ref
XCMG	Mean riparian vegetation cover	Decrease	32	%	62	Ref
XPCMG	Proportion of reach with all three layers present	Decrease	0.09	Proportion	62	Ref
XPMGVEG	Mean vegetative cover	Decrease	0.23	Proportion	73	Ref
W1_HALL_SWAMP	Human activity metric	Decrease	1.5		60	RCMP
Substrate						
PCT_BIGR	% large substrate (>128 mm)	Decrease	27	%	73	Ref
PCT_SAFN	% sands and fines (<2 mm)	Increase	57	%	73	Ref
Shannon_Substrate	Substrate diversity	Decrease	0.53		73	Ref
XEMBED	% cobble embeddedness	Increase	55	%	73	Ref

Table 2-3a. Regional extent and distributions for chemical stressors.

Stressor	n	% Below Threshold			Concentration		
		Estimate	95% CI		Median	Mean	SD
Ions							
Alkalinity as CaCO ₃	558	100	100	100	200	217	100
Chloride	513	81	77	84	108	182	316
Sulfate	507	55	51	59	228	294	327
Metals (dissolved)							
Arsenic (d)	443	100	100	100	1.9	2.3	2.7
Copper (d)	443	99	99	100	1.2	2.3	3.3
Nickel (d)	443	100	100	100	2.2	4.3	15.4
Lead (d)	443	100	100	100	0.00	0.05	0.17
Selenium (d)	469	89	86	91	0.99	2.59	6.51
Zinc (d)	486	100	100	100	2.0	4.1	7.2
Metals (total)							
Arsenic (t)	458	100	100	100	2.3	2.9	7.5
Copper (t)	458	96	94	98	2.0	5.2	9.6
Nickel (t)	458	100	100	100	2.6	5.9	18.1
Lead (t)	458	95	93	97	0.08	1.57	3.85
Selenium (t)	458	87	84	89	1.20	3.33	13.24
Zinc (t)	458	100	100	100	3.9	15.8	31.1
Nutrients							
TN	503	39	35	43	0.6	2.2	4.1
Ammonia-N	516	99	97	100	0.01	1.58	19.52
TP	513	43	39	47	0.05	3.91	65.11
Pyrethroids							
Bifenthrin	430	84	81	88	0	0.8	4.2
Cyfluthrin	430	93	90	96	0	0.2	1.6
Cyhalothrin lambda	430	95	92	97	0	0.022	0.228
Cypermethrin	430	92	88	95	0	0.20	1.32
Deltamethrin	169	89	84	94	0	0.0001	0.0022
Esfenvalerate/Fenvalerate	406	98	97	100	0	0.0282	0.3271
Permethrin	430	97	95	99	0	0.146	1.769
Solids							
Suspended solids	528	75	71	79	4	16	57
Dissolved solids	226	24	19	28	856	1034	774
Field							
pH	645	85	82	88	8.05	8.07	0.62
Turbidity	418	76	72	81	1.7	7.9	48.7
Specific conductance	656	75	72	78	1034	1259	1210

Table 2-3b. Extent and distributions for chemical stressors in each land use class. Only analytes with extents greater than 5% exceeding a threshold are shown.

Stressor	n	% Below Threshold			Concentration		
		Estimate	95% CI		Median	Mean	SD
<i>Agricultural</i>							
Ions							
Chloride	73	84	77	90	133	209	280
Sulfate	74	31	22	39	324	424	344
Metals (dissolved)							
Selenium	68	74	64	85	3.06	6.23	12.00
Metals (total)							
Selenium	67	77	66	88	3.31	6.34	11.83
Nutrients							
TN	72	13	7	20	2.5	6.5	9.9
TP	73	28	21	35	0.08	0.50	0.78
Pyrethroids							
Bifenthrin	62	90	82	97	0	0.2	1.1
Cyfluthrin	62	95	86	100	0	0.2	0.7
Cypermethrin	62	90	80	100	0	0.08	0.45
Esfenvalerate/Fenvalerate	58	89	78	99	0	0.31	1.07
Solids							
Suspended solids	73	79	69	89	5	43	144
Dissolved solids	25	3	0	9	983	1037	383
Field							
pH	87	94	91	97	7.98	8.03	0.45
Turbidity	56	70	58	81	2.4	45.0	159.0
Specific conductance	87	69	61	78	1322	1542	888
<i>Open</i>							
Ions							
Sulfate	220	73	68	77	71	170	214
Metals (total)							
Lead	178	93	89	97	0.03	1.40	3.37
Selenium	178	92	88	96	0.78	1.52	2.22
Nutrients							
TN	219	71	65	77	0.2	0.5	1.2
TP	225	71	66	76	0.02	0.09	0.43
Pyrethroids							
Bifenthrin	163	95	92	98	0	0.0	0.1
Deltamethrin	74	92	86	97	0	0	0
Solids							
Suspended solids	227	89	85	93	2	4	7
Dissolved solids	108	50	42	58	493	678	490

Stressor	n	% Below Threshold			Concentration		
		Estimate	95% CI		Median	Mean	SD
<i>Field</i>							
Turbidity	187	87	83	92	0.9	2.3	6.8
Specific conductance	291	91	88	94	478	672	570
<i>Urban</i>							
<i>Ions</i>							
Chloride	223	66	60	72	190	303	397
Sulfate	213	42	35	48	289	391	369
<i>Metals (dissolved)</i>							
Selenium	207	84	80	89	1.20	3.27	7.36
<i>Metals (total)</i>							
Selenium	213	84	80	88	1.30	4.17	17.41
<i>Nutrients</i>							
TN	212	12	6	19	1.5	3.0	3.4
TP	215	17	11	22	0.11	8.35	96.04
<i>Pyrethroids</i>							
Bifenthrin	205	76	69	83	0	1.4	5.7
Cyfluthrin	205	90	85	95	0	0.4	2.2
Cyhalothrin lambda	205	93	88	97	0	0.041	0.313
Cypermethrin	205	88	82	93	0	0.36	1.79
Deltamethrin	74	85	75	95	0	0	0
<i>Solids</i>							
Suspended solids	228	61	54	69	8	22	56
Dissolved solids	93	1	0	3	1093	1388	885
<i>Field</i>							
pH	272	72	66	79	8.17	8.24	0.69
Turbidity	175	65	57	74	2.3	7.2	19.8
Specific conductance	278	62	56	67	1397	1800	1439

Table 2-3c. Extent and distributions for chemical stressors in each watershed. Only analytes with extents greater 5% exceeding a threshold are shown. Physical habitat variable abbreviations are provided in Table 2-2.

Stressor	n	% Below Threshold				Concentration		
		Estimate	95% CI	Median	Mean	SD		
<u>Region 4</u>								
<i>Ventura</i>								
Ions	Sulfate	38	36	23	50	270	262	66
Nutrients	TN	38	74	64	84	0.1	0.5	1.0
Nutrients	TP	36	92	87	97	0	0.02	0.06
Pyrethroids	Bifenthrin	35	93	86	100	0	0.0	0.0
Solids	Dissolved solids	5	50	4	97	477	560	96
Field	Turbidity	8	76	39	100	0.5	1.9	1.7
<i>Santa Clara</i>								
Ions	Sulfate	75	59	50	68	221	305	333
Metals (dissolved)	Selenium	70	92	86	97	0.81	1.69	3.25
Metals (total)	Copper	59	91	85	98	0.8	6.3	16.1
Metals (total)	Lead	59	91	86	97	0.01	2.17	4.21
Metals (total)	Selenium	59	90	83	97	0.89	3.15	12.17
Nutrients	TN	70	70	61	78	0.2	0.9	2.4
Nutrients	TP	73	82	75	89	0.02	0.10	0.41
Pyrethroids	Bifenthrin	53	93	86	99	0	0.0	0.0
Pyrethroids	Cyfluthrin	53	92	85	100	0	0.1	0.6
Pyrethroids	Cypermethrin	53	94	87	100	0	0.00	0.02
Pyrethroids	Deltamethrin	33	84	73	95	0	0	0
Pyrethroids	Esfenvalerate/Fenvalerate	50	94	87	100	0	0.1178	0.6286
Solids	Suspended solids	73	91	84	98	2	16	83
Solids	Dissolved solids	45	28	15	42	667	751	467
Field	Turbidity	72	89	84	94	1.5	16.9	98.9
<i>Calleguas</i>								
Ions	Chloride	34	86	70	100	182	193	54
Ions	Sulfate	40	25	13	38	419	484	347
Metals (dissolved)	Selenium	38	60	46	74	4.16	7.14	11.46
Metals (total)	Selenium	37	60	47	74	4.18	7.12	11.01
Nutrients	TN	38	6	0	14	4.4	6.7	9.9
Nutrients	Ammonia-N	35	95	87	100	0.06	0.23	0.70
Nutrients	TP	37	23	6	39	0.13	0.83	1.02
Pyrethroids	Bifenthrin	37	86	76	97	0	0.2	1.0
Pyrethroids	Cypermethrin	37	92	82	100	0	0.15	0.53
Pyrethroids	Esfenvalerate/Fenvalerate	31	94	87	100	0	0.1290	0.7575
Solids	Suspended solids	33	72	56	88	6	27	89
Field	pH	34	86	75	98	7.94	8.04	0.47

Stressor		n	% Below Threshold			Concentration		
			Estimate	95% CI		Median	Mean	SD
Field	Turbidity	9	73	43	100	1.4	2.9	3.0
Field	Specific conductance	34	60	43	77	1691	1785	597
<i>Santa Monica Bay</i>								
Ions	Chloride	47	86	80	93	190	199	72
Ions	Sulfate	54	8	4	12	884	954	570
Metals (dissolved)	Selenium	53	41	34	49	6.61	13.76	20.47
Metals (total)	Selenium	54	45	38	53	5.33	21.80	58.27
Nutrients	TN	50	30	22	39	0.6	1.3	2.0
Nutrients	TP	49	18	11	24	0.10	0.15	0.18
Pyrethroids	Bifenthrin	42	65	52	78	0	3.5	15.6
Pyrethroids	Cyfluthrin	42	89	81	97	0	1.0	4.7
Pyrethroids	Cyhalothrin lambda	42	74	62	86	0	0.237	1.083
Pyrethroids	Cypermethrin	42	83	73	93	0	0.42	1.73
Pyrethroids	Deltamethrin	24	71	56	87	0	0	0
Pyrethroids	Esfenvalerate/Fenvalerate	42	93	86	100	0	0.0291	0.1146
Pyrethroids	Permethrin	42	86	76	95	0	1.119	4.593
Solids	Suspended solids	47	88	81	96	2	10	44
Field	Turbidity	65	70	61	80	1.8	10.9	46.0
Field	Specific conductance	69	59	52	67	1640	1899	1265
<i>Los Angeles</i>								
Ions	Sulfate	32	86	76	96	84	137	152
Metals (total)	Copper	26	82	67	98	7.0	10.4	10.1
Metals (total)	Lead	26	92	82	100	0.65	1.60	2.26
Nutrients	TN	31	34	19	49	1.1	2.5	2.6
Nutrients	TP	22	18	0	36	0.17	0.20	0.16
Pyrethroids	Bifenthrin	26	73	57	89	0	0.5	1.1
Pyrethroids	Cypermethrin	26	92	80	100	0	0.55	1.90
Solids	Suspended solids	19	63	43	84	5	22	35
Solids	Dissolved solids	9	28	4	52	653	1061	837
Field	pH	42	66	53	78	8.25	8.45	0.79
Field	Turbidity	8	67	33	100	0.4	7.6	11.7
Field	Specific conductance	44	91	83	100	570	838	561
<i>San Gabriel</i>								
Ions	Chloride	29	89	76	100	146	127	97
Ions	Sulfate	28	79	59	99	168	151	115
Metals (total)	Copper	27	94	86	100	2.7	7.0	11.4
Metals (total)	Lead	27	91	81	100	0.16	2.04	5.39
Metals (total)	Selenium	27	88	80	97	1.29	2.16	2.00
Nutrients	TN	29	36	20	52	0.6	1.6	2.1
Nutrients	TP	30	44	26	62	0.06	0.12	0.24

Stressor		n	% Below Threshold				Concentration		
			Estimate	95% CI			Median	Mean	SD
Pyrethroids	Bifenthrin	24	87	72	100	0	1.7	6.3	
Pyrethroids	Cyfluthrin	24	87	72	100	0	0.8	2.9	
Pyrethroids	Cyhalothrin lambda	24	87	72	100	0	0.105	0.371	
Pyrethroids	Cypermethrin	24	87	72	100	0	0.82	3.10	
Solids	Suspended solids	30	69	51	86	8	37	96	
Solids	Dissolved solids	14	13	5	22	859	823	262	
Field	pH	33	59	42	76	8.25	8.39	0.65	
Field	Turbidity	17	67	44	90	2.1	4.3	4.3	
Region 8									
<i>Lower Santa Ana</i>									
Ions	Chloride	29	81	68	94	179	186	91	
Ions	Sulfate	24	40	22	58	300	372	248	
Metals (dissolved)	Selenium	28	86	76	97	1.30	5.38	10.38	
Metals (total)	Selenium	28	86	76	97	1.40	5.37	10.17	
Nutrients	TN	24	10	0	20	2.2	3.4	3.5	
Nutrients	TP	27	20	8	31	0.12	157.2	398.9	
Pyrethroids	Bifenthrin	27	70	55	85	0	0.9	2.0	
Pyrethroids	Cyhalothrin lambda	27	93	86	100	0	0.000	0.000	
Pyrethroids	Permethrin	27	87	75	99	0	0.121	0.727	
Solids	Suspended solids	36	63	52	75	6	11	15	
Field	pH	41	87	80	94	7.98	7.97	0.64	
Field	Turbidity	36	87	79	95	1.9	2.7	3.6	
Field	Specific conductance	41	68	57	80	1408	1587	580	
<i>Middle Santa Ana</i>									
Metals (dissolved)	Copper	10	89	70	100	3.1	3.9	3.5	
Metals (total)	Copper	15	93	80	100	3.7	5.1	4.4	
Nutrients	TN	23	16	2	30	2.0	4.1	4.4	
Nutrients	TP	33	14	7	21	0.19	0.52	0.59	
Solids	Suspended solids	35	72	62	83	5	8	8	
Field	pH	55	65	54	75	8.20	8.29	0.90	
Field	Turbidity	23	63	45	81	3.1	5.4	6.2	
Field	Specific conductance	55	78	68	88	935	866	416	
<i>Upper Santa Ana</i>									
Metals (dissolved)	Copper	12	93	81	100	0.9	1.8	2.8	
Nutrients	TN	31	50	37	64	0.3	0.6	0.9	
Nutrients	Ammonia-N	43	91	77	100	0.01	23.61	75.91	
Nutrients	TP	42	54	42	67	0.02	0.29	0.66	
Pyrethroids	Bifenthrin	15	90	77	100	0	0.0	0.0	
Solids	Suspended solids	44	75	62	88	3	9	20	

Stressor		n	% Below Threshold			Concentration		
			Estimate	95% CI		Median	Mean	SD
Field	pH	67	83	75	91	7.98	7.66	0.96
Field	Turbidity	32	88	77	99	0.4	1.5	2.6
<i>San Jacinto</i>								
Ions	Chloride	16	83	73	94	16	90	142
Nutrients	TN	14	53	41	65	0.3	0.8	1.1
Nutrients	TP	17	18	2	36	0.08	0.17	0.23
Solids	Suspended solids	17	82	70	95	2	6	9
Field	pH	27	81	73	89	7.48	7.67	0.84
Field	Turbidity	6	66	32	99	2.3	38.1	57.4
Field	Specific conductance	27	84	75	94	192	451	568
<u>Region 9</u>								
<i>San Juan</i>								
Ions	Chloride	31	65	51	79	151	205	149
Ions	Sulfate	31	43	31	56	289	450	432
Metals (dissolved)	Selenium	30	76	62	90	1.96	5.00	6.85
Metals (total)	Lead	30	94	88	100	0.00	1.83	2.68
Metals (total)	Selenium	30	75	61	89	1.99	5.10	6.75
Nutrients	TN	30	56	40	71	0.3	0.7	1.1
Nutrients	TP	27	29	18	41	0.06	1.26	4.27
Pyrethroids	Bifenthrin	30	77	64	90	0	0.7	2.0
Pyrethroids	Cyfluthrin	30	86	75	97	0	0.2	0.6
Pyrethroids	Cyhalothrin lambda	30	92	84	100	0	0.017	0.097
Pyrethroids	Cypermethrin	30	86	75	97	0	0.08	0.24
Pyrethroids	Deltamethrin	13	92	84	100	0	0	0
Solids	Suspended solids	30	87	76	97	3	7	12
Solids	Dissolved solids	30	27	18	37	1193	1331	1061
Field	Turbidity	29	83	70	96	0.9	1.8	2.6
Field	Specific conductance	31	59	47	71	1394	1690	1191
<i>Northern San Diego</i>								
Ions	Chloride	31	74	61	87	120	161	141
Ions	Sulfate	31	58	41	75	220	203	190
Nutrients	TN	31	16	1	31	1.2	2.3	3.3
Nutrients	TP	29	51	36	67	0.03	0.07	0.10
Solids	Suspended solids	33	86	76	97	4	6	11
Solids	Dissolved solids	7	22	0	51	780	767	268
Field	Turbidity	28	83	70	96	0.7	6.0	17.5
Field	Specific conductance	33	63	49	77	834	1046	772
<i>Central San Diego</i>								
Ions	Chloride	36	42	29	55	289	507	631
Ions	Sulfate	36	23	13	32	330	359	273

Stressor		n	% Below Threshold				Concentration		
			Estimate	95% CI			Median	Mean	SD
Metals (dissolved)	Selenium	31	89	78	100	1.09	1.65	1.85	
Metals (total)	Selenium	31	89	78	100	1.14	1.74	2.03	
Nutrients	TN	33	16	6	25	1.3	3.5	4.3	
Nutrients	TP	29	12	3	21	0.09	0.10	0.06	
Pyrethroids	Bifenthrin	31	77	62	92	0	2.2	5.7	
Pyrethroids	Cyfluthrin	31	88	75	100	0	0.2	0.5	
Pyrethroids	Cyhalothrin lambda	31	93	83	100	0	0.007	0.029	
Pyrethroids	Cypermethrin	31	87	75	99	0	0.01	0.03	
Pyrethroids	Deltamethrin	21	83	68	99	0	0	0	
Pyrethroids	Permethrin	31	94	85	100	0	0.114	0.462	
Solids	Suspended solids	35	52	36	67	9	15	23	
Solids	Dissolved solids	9	16	0	38	1306	1112	517	
Field	pH	36	95	86	100	7.89	7.90	0.32	
Field	Turbidity	30	63	45	80	2.6	8.6	17.1	
Field	Specific conductance	37	25	14	35	2112	2469	2151	
<i>Mission Bay and San Diego</i>									
Ions	Chloride	30	37	32	42	447	398	332	
Ions	Sulfate	30	41	35	46	314	345	334	
Metals (dissolved)	Selenium	30	93	84	100	0.77	1.25	1.71	
Metals (total)	Selenium	30	93	84	100	0.82	1.34	1.74	
Nutrients	TN	28	28	19	37	1.1	2.2	3.4	
Nutrients	TP	28	35	21	49	0.05	0.11	0.13	
Pyrethroids	Bifenthrin	30	86	75	97	0	0.0	0.2	
Pyrethroids	Cyfluthrin	30	93	86	100	0	0.0	0.1	
Pyrethroids	Cyhalothrin lambda	30	91	83	99	0	0.004	0.020	
Pyrethroids	Cypermethrin	30	89	79	99	0	0.00	0.02	
Pyrethroids	Deltamethrin	19	94	85	100	0	0	0	
Solids	Suspended solids	31	66	52	80	4	11	14	
Solids	Dissolved solids	9	88	72	100	333	450	368	
Field	pH	30	93	86	100	7.95	7.94	0.40	
Field	Turbidity	26	64	50	77	2.5	4.8	5.1	
Field	Specific conductance	30	39	32	47	2385	1933	1532	
<i>Southern San Diego</i>									
Ions	Chloride	33	78	72	84	60	308	538	
Ions	Sulfate	33	81	75	87	68	128	145	
Metals (total)	Lead	30	93	84	100	0.09	1.21	2.36	
Nutrients	TN	33	60	49	70	0.3	0.9	1.7	
Nutrients	TP	30	38	22	54	0.04	0.23	0.83	
Pyrethroids	Bifenthrin	30	98	95	100	0	0.0	0.1	
Pyrethroids	Cypermethrin	30	98	95	100	0	0.00	0.03	

Stressor		n	% Below Threshold			Concentration		
			Estimate	95% CI		Median	Mean	SD
Solids	Suspended solids	33	83	71	94	4	6	10
Solids	Dissolved solids	10	63	40	86	479	510	219
Field	Turbidity	29	71	55	86	1.6	3.5	4.1
Field	Specific conductance	33	54	42	65	671	1500	1911

Table 2-4. Extent of toxicity by subpopulation.

Subpopulation	n	% stream-miles with toxicity to survival	% stream-miles with toxicity to reproduction	% stream-miles with no toxicity
South Coast	431	6	25	67
<i>Land Use</i>				
Agricultural	67	15	30	55
Open	171	2	33	61
Urban	193	8	19	73
<i>Watershed</i>				
Region 4				
Ventura	34	1	15	77
Santa Clara	56	8	42	45
Calleguas	36	1	8	91
Santa Monica	38	7	33	60
Los Angeles	34	2	57	42
San Gabriel	26	1	6	90
Region 8				
Lower Santa Ana	28	0	26	67
Middle Santa Ana	22	0	4	96
Upper Santa Ana	14	11	12	77
San Jacinto	14	0	12	88
Region 9				
San Juan	25	8	23	69
Northern San Diego	30	3	23	74
Central San Diego	24	26	12	61
Mission Bay and San Diego River	26	4	31	65
Southern San Diego	24	13	11	76

Table 2-5a. Extent and mean values of selected physical habitat variables within the region. Abbreviations are provided in Table 2-2.

Variable	n	% Within Threshold			Median	Mean	SD
		Estimate	95% CI				
Biomass							
AFDM	526	82	78	85	7	652	2877
Chlorophyll a	531	83	79	87	10	165	880
PCT_CPOM	599	90	88	92	28	33	26
PCT_MAP	481	69	65	74	26	30	25
PCT_MCP	481	89	86	92	5	13	18
PCT_MIAT1	519	92	90	94	0	4	11
XMIATP	519	91	89	94	0.10	0.32	0.63
Instream habitat							
PCT_FAST	601	75	72	79	28	37	33
Shannon_Flow	601	80	76	83	2.7	2.7	0.3
Shannon_Habitat	634	68	65	72	1.4	1.2	0.5
XFC_NAT_SWAMP	634	73	69	76	51	54	41
Riparian							
W1_HALL_SWAMP	597	55	52	59	1.2	1.8	1.9
XCDENMID	617	69	66	73	43	45	35
XCMG	602	68	65	72	80	80	60
XPCMG	602	71	68	74	0.65	0.53	0.42
XPMGVEG	634	70	67	73	0.75	0.59	0.41
Substrate							
PCT_BIGR	634	49	45	52	25	30	28
PCT_SAFN	634	78	75	81	25	33	27
Shannon_Substrate	634	73	69	77	1.0	0.9	0.5
XEMBED	485	89	86	92	35	36	18

Table 2-5b. Extent and mean values of selected physical habitat variables by land use. Only variables with exceedances greater than 5% of a subpopulation are shown.

Variable	n	% Within Threshold			Median	Mean	SD	
		Estimate	95% CI					
<i>Agricultural</i>								
Biomass	AFDM	75	72	62	81	13	703	2427
Biomass	Chlorophyll a	75	74	64	84	20	486	1837
Biomass	PCT_CPOM	76	86	79	94	36	38	27
Biomass	PCT_MAP	69	69	60	79	28	30	22
Biomass	PCT_MCP	69	88	81	95	12	18	18
InstreamHab	PCT_FAST	76	71	61	81	24	37	33
InstreamHab	Shannon_Flow	76	80	72	89	2.6	2.6	0.3
InstreamHab	Shannon_Habitat	81	80	73	87	1.4	1.3	0.4
InstreamHab	XFC_NAT_SWAMP	81	79	72	87	49	61	47
Riparian	W1_HALL_SWAMP	76	70	63	78	0.6	1.0	1.2
Riparian	XCDENMID	76	58	49	67	23	35	35
Riparian	XCMG	76	80	72	88	104	94	59
Riparian	XPCMG	76	76	68	84	0.79	0.61	0.41
Riparian	XPMGVEG	81	85	78	91	0.81	0.70	0.35
Substrate	PCT_BIGR	81	24	16	32	9	18	21
Substrate	PCT_SAFN	81	40	30	49	63	60	27
Substrate	Shannon_Substrate	81	78	69	88	0.8	0.9	0.4
Substrate	XEMBED	54	81	71	92	40	41	22
<i>Open</i>								
Biomass	AFDM	224	82	77	87	11	173	672
Biomass	Chlorophyll a	227	85	80	90	12	62	201
Biomass	PCT_CPOM	261	88	85	92	34	38	25
Biomass	PCT_MAP	203	83	78	88	14	21	21
Biomass	PCT_MCP	203	87	83	91	7	14	16
Biomass	PCT_MIAT1	217	94	90	97	0	4	9
Biomass	XMIATP	217	94	90	97	0.10	0.26	0.49
InstreamHab	PCT_FAST	263	92	89	95	40	46	29
InstreamHab	Shannon_Flow	263	93	90	95	2.8	2.8	0.3
InstreamHab	Shannon_Habitat	290	90	87	93	1.5	1.4	0.3
InstreamHab	XFC_NAT_SWAMP	290	93	89	97	71	72	35
Riparian	W1_HALL_SWAMP	261	91	87	94	0.2	0.5	0.8
Riparian	XCDENMID	289	85	82	89	61	58	31
Riparian	XCMG	264	93	89	98	108	106	45
Riparian	XPCMG	264	93	90	95	0.86	0.70	0.33
Riparian	XPMGVEG	290	93	90	96	0.91	0.78	0.29
Substrate	PCT_BIGR	290	82	78	86	54	49	24

Variable		n	% Within Threshold			Median	Mean	SD
			Estimate	95% CI				
Substrate	PCT_SAFN	290	88	84	91	24	29	21
Substrate	Shannon_Substrate	290	92	87	96	1.2	1.2	0.4
Substrate	XEMBED	276	91	88	94	35	36	16
<i>Urban</i>								
Biomass	AFDM	227	83	77	89	5	1089	3944
Biomass	Chlorophyll a	229	83	77	89	7	206	991
Biomass	PCT_CPOM	262	92	89	96	17	27	27
Biomass	PCT_MAP	209	58	50	65	37	38	27
Biomass	PCT_MCP	209	91	87	95	2	12	20
Biomass	PCT_MIAT1	232	90	86	94	0	5	12
Biomass	XMIATP	232	89	84	93	0.11	0.37	0.68
InstreamHab	PCT_FAST	262	62	55	69	14	30	34
InstreamHab	Shannon_Flow	262	68	62	74	2.6	2.6	0.2
InstreamHab	Shannon_Habitat	263	44	38	50	0.9	0.9	0.6
InstreamHab	XFC_NAT_SWAMP	263	50	45	56	19	34	36
Riparian	W1_HALL_SWAMP	260	23	87	98	2.9	3.0	1.8
Riparian	XCDENMID	252	54	48	60	20	32	35
Riparian	XCMG	262	44	39	49	22	54	62
Riparian	XPCMG	262	51	46	57	0.10	0.37	0.42
Riparian	XPMGVEG	263	44	39	49	0.09	0.37	0.42
Substrate	PCT_BIGR	263	20	15	24	1	13	21
Substrate	PCT_SAFN	263	74	69	79	25	33	30
Substrate	Shannon_Substrate	263	53	47	59	0.6	0.6	0.5
Substrate	XEMBED	155	86	80	92	35	35	20

Table 2-5c. Extent and mean values of selected physical habitat variables by watershed. Only variables with exceedances greater than 5% of a subpopulation are shown.

Variable	n	% within Threshold			Median	Mean	SD	
		Estimate	95% CI					
<i>Region 4</i>								
<i>Ventura</i>								
Biomass	AFDM	37	89	79	100	4	786	3883
Biomass	Chlorophyll a	37	89	79	100	5	88	384
Biomass	PCT_MAP	24	78	60	96	19	25	22
Biomass	PCT_MCP	24	93	85	100	1	7	14
InstreamHab	PCT_FAST	36	95	90	99	36	45	26
Riparian	W1_HALL_SWAMP	36	93	87	98	0.5	0.6	0.6
Riparian	XCDENMID	37	87	75	98	58	59	32
Riparian	XPMGVEG	38	90	78	100	0.69	0.66	0.23
Substrate	PCT_BIGR	38	86	79	94	62	62	22
<i>Santa Clara</i>								
Biomass	AFDM	73	78	70	86	23	153	917
Biomass	Chlorophyll a	75	83	75	92	18	64	200
Biomass	PCT_CPOM	72	73	63	83	54	54	26
Biomass	PCT_MAP	66	75	66	84	28	29	21
Biomass	PCT_MCP	66	84	76	92	18	19	18
Biomass	PCT_MIAT1	70	93	87	99	0	3	8
Biomass	XMIATP	70	91	84	98	0.02	0.24	0.43
InstreamHab	PCT_FAST	72	87	80	94	28	37	27
InstreamHab	Shannon_Flow	72	92	86	98	2.8	2.8	0.3
InstreamHab	Shannon_Habitat	83	86	78	93	1.5	1.4	0.3
InstreamHab	XFC_NAT_SWAMP	83	94	89	99	61	69	34
Riparian	W1_HALL_SWAMP	72	92	87	97	0.0	0.4	0.8
Riparian	XCDENMID	83	72	63	80	37	44	32
Riparian	XCMG	72	93	90	97	112	108	44
Riparian	XPCMG	72	89	84	94	0.86	0.69	0.35
Riparian	XPMGVEG	83	94	91	98	0.90	0.81	0.25
Substrate	PCT_BIGR	83	74	67	81	47	44	24
Substrate	PCT_SAFN	83	83	77	90	30	35	23
Substrate	Shannon_Substrate	83	92	86	98	1.3	1.2	0.4
Substrate	XEMBED	75	87	81	93	34	36	17
<i>Calleguas</i>								
Biomass	AFDM	40	73	59	88	9	1435	3373
Biomass	Chlorophyll a	40	68	53	83	23	1035	2807
Biomass	PCT_MAP	27	61	43	80	37	36	22
InstreamHab	PCT_FAST	37	84	73	94	30	37	25
InstreamHab	Shannon_Flow	37	89	80	98	2.7	2.7	0.2

Variable		n	% within Threshold			Median	Mean	SD
			Estimate	95% CI				
InstreamHab	Shannon_Habitat	39	73	60	86	1.4	1.2	0.5
InstreamHab	XFC_NAT_SWAMP	39	74	62	86	41	38	27
Riparian	W1_HALL_SWAMP	37	28	14	43	2.7	2.6	1.3
Riparian	XCDENMID	39	60	47	72	25	33	30
Riparian	XCMG	37	67	54	81	58	56	40
Riparian	XPCMG	37	71	58	83	0.25	0.42	0.38
Riparian	XPMGVEG	39	67	55	79	0.40	0.44	0.36
Substrate	PCT_BIGR	39	27	14	41	8	18	23
Substrate	PCT_SAFN	39	62	49	76	43	42	29
Substrate	Shannon_Substrate	39	69	57	80	0.8	0.8	0.5
Substrate	XEMBED	26	89	80	99	32	38	19
<i>Santa Monica Bay</i>								
Biomass	AFDM	53	36	25	47	55	59	40
Biomass	Chlorophyll a	54	39	28	49	67	107	109
Biomass	PCT_CPOM	66	43	33	53	77	71	24
Biomass	PCT_MAP	60	53	42	63	40	40	26
Biomass	PCT_MCP	60	91	85	97	6	13	17
Biomass	PCT_MIAT1	60	91	85	98	0	5	13
Biomass	XMIATP	60	94	89	100	0.08	0.40	1.19
InstreamHab	PCT_FAST	66	77	70	85	17	21	17
InstreamHab	Shannon_Flow	66	86	79	93	2.7	2.8	0.3
InstreamHab	Shannon_Habitat	66	86	80	92	1.6	1.5	0.4
InstreamHab	XFC_NAT_SWAMP	66	90	85	95	84	82	44
Riparian	W1_HALL_SWAMP	66	69	61	78	0.6	1.1	1.3
Riparian	XCDENMID	66	88	82	94	83	71	31
Riparian	XCMG	66	86	81	92	138	124	54
Riparian	XPCMG	66	91	87	96	0.98	0.85	0.31
Riparian	XPMGVEG	66	85	79	91	0.95	0.81	0.34
Substrate	PCT_BIGR	66	70	63	76	43	44	28
Substrate	PCT_SAFN	66	92	87	96	17	24	20
Substrate	Shannon_Substrate	66	88	83	93	1.3	1.2	0.5
<i>Los Angeles</i>								
Biomass	AFDM	31	80	67	92	4	907	2294
Biomass	Chlorophyll a	31	74	61	87	7	133	364
Biomass	PCT_MAP	33	67	52	82	28	33	23
InstreamHab	PCT_FAST	44	77	65	89	53	51	37
InstreamHab	Shannon_Flow	44	72	61	83	2.6	2.6	0.2
InstreamHab	Shannon_Habitat	47	49	39	60	0.9	0.9	0.6
InstreamHab	XFC_NAT_SWAMP	47	45	33	57	14	32	36
Riparian	W1_HALL_SWAMP	44	45	33	56	2.8	2.7	2.4
Riparian	XCDENMID	47	58	45	70	21	31	34

Variable		n	% within Threshold			Median	Mean	SD
			Estimate	95% CI				
Riparian	XCMG	44	32	20	43	16	32	36
Riparian	XPCMG	44	53	40	65	0.09	0.26	0.35
Riparian	XPMGVEG	47	37	26	48	0.00	0.27	0.38
Substrate	PCT_BIGR	47	40	30	50	1	21	26
Substrate	Shannon_Substrate	47	52	38	65	0.5	0.6	0.5
<i>San Gabriel</i>								
Biomass	AFDM	28	72	53	92	5	1758	3644
Biomass	Chlorophyll a	28	75	57	94	6	279	550
Biomass	PCT_MAP	28	52	35	68	36	40	33
InstreamHab	PCT_FAST	40	62	46	77	27	42	39
InstreamHab	Shannon_Flow	40	69	54	83	2.5	2.6	0.3
InstreamHab	Shannon_Habitat	40	39	28	50	0.7	0.8	0.6
InstreamHab	XFC_NAT_SWAMP	40	42	29	55	14	33	40
Riparian	W1_HALL_SWAMP	38	26	19	34	3.2	3.0	1.9
Riparian	XCDENMID	40	50	38	61	11	28	33
Riparian	XCMG	40	35	25	44	9	36	45
Riparian	XPCMG	40	39	28	49	0.00	0.27	0.39
Riparian	XPMGVEG	40	29	19	40	0.00	0.24	0.35
Substrate	PCT_BIGR	40	28	18	39	0	21	30
Substrate	PCT_SAFN	40	91	82	100	6	15	20
Substrate	Shannon_Substrate	40	47	34	60	0.5	0.6	0.6
Substrate	XEMBED	24	91	77	100	34	33	18
<u>Region 8</u>								
<i>Lower Santa Ana</i>								
Biomass	AFDM	29	91	82	99	4	193	754
Biomass	Chlorophyll a	29	91	82	99	9	89	354
Biomass	PCT_MAP	27	57	43	71	39	36	18
InstreamHab	PCT_FAST	38	57	43	71	16	23	28
InstreamHab	Shannon_Flow	38	59	45	74	2.5	2.5	0.3
InstreamHab	Shannon_Habitat	38	66	55	77	1.3	1.2	0.4
InstreamHab	XFC_NAT_SWAMP	38	71	60	82	53	53	45
Riparian	W1_HALL_SWAMP	38	17	7	26	2.3	2.7	1.5
Riparian	XCDENMID	38	50	36	65	18	36	38
Riparian	XCMG	38	46	31	60	27	47	41
Riparian	XPCMG	38	52	38	66	0.10	0.34	0.40
Riparian	XPMGVEG	38	53	38	68	0.28	0.45	0.42
Substrate	PCT_BIGR	38	35	22	47	7	21	25
Substrate	PCT_SAFN	38	69	55	82	48	45	27
Substrate	Shannon_Substrate	38	78	67	88	0.8	0.8	0.4
Substrate	XEMBED	28	87	73	100	37	37	20
<i>Middle Santa Ana</i>								

Variable		n	% within Threshold			Median	Mean	SD
			Estimate	95% CI				
Biomass	AFDM	28	91	79	100	3	11	17
Biomass	PCT_CPOM	52	95	90	100	21	23	21
Biomass	PCT_MAP	32	87	79	95	15	21	20
Biomass	PCT_MCP	32	89	80	98	0	9	14
Biomass	PCT_MIAT1	32	77	63	91	1	13	21
Biomass	XMIATP	32	77	63	91	0.37	0.98	1.66
InstreamHab	PCT_FAST	53	42	31	53	2	22	32
InstreamHab	Shannon_Flow	53	39	29	50	2.3	2.4	0.4
InstreamHab	Shannon_Habitat	54	29	19	40	0.9	0.8	0.6
InstreamHab	XFC_NAT_SWAMP	54	41	32	49	11	28	35
Riparian	W1_HALL_SWAMP	52	49	40	58	1.6	2.0	1.7
Riparian	XCDENMID	54	39	29	48	2	27	36
Riparian	XCMG	53	54	46	62	42	51	49
Riparian	XPCMG	53	47	37	57	0.00	0.36	0.42
Riparian	XPMGVEG	54	58	51	66	0.41	0.46	0.43
Substrate	PCT_BIGR	54	23	17	29	0	17	29
Substrate	PCT_SAFN	54	63	56	69	31	41	40
Substrate	Shannon_Substrate	54	43	33	53	0.4	0.6	0.5
Substrate	XEMBED	28	94	86	100	33	33	20
<i>Upper Santa Ana</i>								
Biomass	PCT_MAP	27	90	82	98	3	13	19
Biomass	PCT_MCP	27	93	85	100	1	8	16
Biomass	XMIATP	27	94	87	100	0.14	0.28	0.52
InstreamHab	PCT_FAST	47	93	87	99	81	66	33
InstreamHab	Shannon_Flow	47	69	57	81	2.6	2.6	0.2
InstreamHab	Shannon_Habitat	52	58	47	68	1.2	1.1	0.5
InstreamHab	XFC_NAT_SWAMP	52	88	81	95	58	63	39
Riparian	W1_HALL_SWAMP	47	96	91	100	0.2	0.4	0.5
Riparian	XCDENMID	52	68	58	78	66	55	38
Riparian	XCMG	47	75	65	86	73	79	54
Riparian	XPCMG	47	63	51	74	0.68	0.51	0.42
Riparian	XPMGVEG	52	79	70	89	0.72	0.64	0.37
Substrate	PCT_BIGR	52	82	74	90	60	55	24
Substrate	PCT_SAFN	52	92	87	98	25	29	17
Substrate	Shannon_Substrate	52	92	86	99	1.1	1.1	0.4
Substrate	XEMBED	49	88	80	96	38	41	11
<i>San Jacinto</i>								
Biomass	AFDM	17	91	79	100	12	19	24
Biomass	PCT_MAP	22	88	76	99	5	13	15
Biomass	PCT_MCP	22	77	62	92	16	20	20
InstreamHab	PCT_FAST	26	44	31	58	5	20	28

Variable		n	% within Threshold			Median	Mean	SD
			Estimate	95% CI				
InstreamHab	Shannon_Flow	26	53	38	69	2.4	2.5	0.2
InstreamHab	Shannon_Habitat	27	72	58	85	1.3	1.2	0.4
Riparian	W1_HALL_SWAMP	26	65	52	77	1.0	1.4	1.4
Riparian	XCDENMID	27	81	74	89	85	69	33
Riparian	XCMG	26	95	87	100	80	93	49
Riparian	XPCMG	26	79	67	91	0.77	0.67	0.39
Riparian	XPMGVEG	27	90	81	99	0.86	0.75	0.30
Substrate	PCT_BIGR	27	65	55	74	39	34	26
Substrate	PCT_SAFN	27	70	56	84	44	46	26
Substrate	Shannon_Substrate	27	83	71	95	1.1	1.0	0.4
Substrate	XEMBED	23	90	79	100	41	41	9

Region 9

San Juan

Biomass	AFDM	31	76	62	90	6	1916	7004
Biomass	Chlorophyll a	31	75	60	90	18	123	333
Biomass	PCT_MAP	28	48	31	65	42	41	25
Biomass	PCT_MCP	28	92	85	99	3	10	14
Biomass	PCT_MIAT1	30	82	70	93	0	7	12
Biomass	XMIATP	30	85	75	95	0.04	0.45	0.95
InstreamHab	PCT_FAST	31	83	72	94	31	36	26
InstreamHab	Shannon_Habitat	31	76	63	90	1.4	1.2	0.5
InstreamHab	XFC_NAT_SWAMP	31	74	59	88	46	43	29
Riparian	W1_HALL_SWAMP	31	46	33	58	2.1	2.5	2.1
Riparian	XCDENMID	31	77	62	91	53	50	29
Riparian	XCMG	31	71	56	87	77	74	53
Riparian	XPCMG	31	79	67	92	0.57	0.54	0.36
Riparian	XPMGVEG	31	69	54	83	0.72	0.57	0.42
Substrate	PCT_BIGR	31	54	39	69	29	29	23
Substrate	PCT_SAFN	31	88	80	97	39	36	21
Substrate	Shannon_Substrate	31	69	54	83	0.7	0.8	0.4
Substrate	XEMBED	25	90	80	99	34	34	14

Northern San Diego

Biomass	AFDM	36	91	84	99	4	12	18
Biomass	Chlorophyll a	36	94	88	100	4	13	26
Biomass	PCT_CPOM	31	90	79	100	41	45	16
Biomass	PCT_MAP	29	76	63	89	13	21	23
Biomass	PCT_MCP	29	79	66	92	15	21	19
InstreamHab	PCT_FAST	31	73	61	85	26	25	24
InstreamHab	Shannon_Flow	31	82	68	96	2.7	2.6	0.3
Riparian	W1_HALL_SWAMP	31	96	91	100	0.1	0.4	0.5
Riparian	XCDENMID	29	93	87	100	70	71	25

Variable		n	% within Threshold			Median	Mean	SD
			Estimate	95% CI				
Substrate	PCT_BIGR	33	55	38	72	28	31	26
Substrate	PCT_SAFN	33	45	20	70	58	57	24
Substrate	Shannon_Substrate	33	84	72	96	1.1	1.0	0.4
Substrate	XEMBED	21	75	54	97	35	40	21
<i>Central San Diego</i>								
Biomass	PCT_CPOM	27	78	62	94	55	55	22
Biomass	PCT_MAP	26	87	76	98	21	22	22
Biomass	PCT_MCP	26	86	74	99	12	20	26
Biomass	PCT_MIAT1	26	78	62	93	9	13	14
Biomass	XMIATP	26	69	51	88	0.66	0.76	0.64
InstreamHab	PCT_FAST	27	70	53	88	12	21	25
InstreamHab	Shannon_Flow	27	85	74	97	2.7	2.7	0.2
InstreamHab	Shannon_Habitat	31	74	58	91	1.5	1.4	0.5
InstreamHab	XFC_NAT_SWAMP	31	80	68	93	70	62	38
Riparian	W1_HALL_SWAMP	27	28	12	44	2.1	2.1	1.1
Riparian	XCMG	28	94	87	100	137	132	55
Riparian	XPCMG	28	90	78	100	0.90	0.77	0.34
Riparian	XPMGVEG	31	94	89	100	0.95	0.88	0.24
Substrate	PCT_BIGR	31	27	13	41	13	18	20
Substrate	PCT_SAFN	31	43	27	59	62	56	29
Substrate	Shannon_Substrate	31	80	65	95	1.1	1.0	0.5
Substrate	XEMBED	23	77	61	93	42	42	23
<i>Mission Bay and San Diego</i>								
Biomass	AFDM	30	95	87	100	4	10	13
Biomass	PCT_CPOM	27	90	82	97	47	48	18
Biomass	PCT_MAP	27	81	68	94	12	21	21
Biomass	PCT_MCP	27	72	58	86	15	22	18
Biomass	PCT_MIAT1	27	77	63	91	2	12	18
Biomass	XMIATP	27	77	62	91	0.44	0.71	0.68
InstreamHab	PCT_FAST	27	66	54	77	17	29	30
InstreamHab	Shannon_Flow	27	78	66	90	2.8	2.8	0.3
InstreamHab	Shannon_Habitat	27	84	75	94	1.5	1.4	0.4
InstreamHab	XFC_NAT_SWAMP	27	88	81	95	82	75	39
Riparian	W1_HALL_SWAMP	27	52	42	62	0.4	1.6	1.8
Riparian	XCDENMID	23	85	76	94	66	53	29
Riparian	XCMG	27	84	75	94	131	110	54
Riparian	XPCMG	27	84	75	94	0.86	0.69	0.35
Riparian	XPMGVEG	27	92	84	100	0.99	0.78	0.31
Substrate	PCT_BIGR	27	51	37	65	28	29	26
Substrate	PCT_SAFN	27	66	51	82	40	44	26
Substrate	Shannon_Substrate	27	88	81	95	1.1	1.1	0.5

Variable		n	% within Threshold			Median	Mean	SD
			Estimate	95% CI				
Substrate	XEMBED	21	91	82	100	39	38	18
Biomass	AFDM	32	76	62	90	5	23	35
<i>Southern San Diego</i>								
Biomass	PCT_CPOM	25	76	62	90	49	50	23
Biomass	PCT_MAP	25	66	50	82	10	24	28
Biomass	PCT_MCP	25	56	36	76	35	34	23
Biomass	PCT_MIAT1	25	89	80	99	4	8	9
Biomass	XMIATP	25	92	82	100	0.51	0.55	0.37
InstreamHab	PCT_FAST	26	85	77	92	29	32	21
InstreamHab	Shannon_Flow	26	94	87	100	2.9	2.8	0.2
InstreamHab	Shannon_Habitat	28	85	74	96	1.4	1.4	0.3
InstreamHab	XFC_NAT_SWAMP	28	94	85	100	60	67	36
Riparian	W1_HALL_SWAMP	25	93	87	99	0.3	0.5	0.6
Riparian	XCDENMID	24	90	77	100	53	58	28
Riparian	XPCMG	26	91	80	100	0.76	0.64	0.33
Substrate	PCT_BIGR	28	48	30	66	25	28	22
Substrate	PCT_SAFN	28	51	33	68	51	52	23
Substrate	Shannon_Substrate	28	95	88	100	1.1	1.0	0.3
Substrate	XEMBED	20	86	72	100	37	39	16

Table 2-6. Relative (RR) and attributable (AR) risks for selected indicators. n: number of sites included in the analysis. 95% CI: 95% confidence interval around estimate. (t) indicates that the total fraction of metals were used in the analysis. (d) indicates that the dissolved fraction of metals were used in the analysis. VH: Very high priority (i.e., attributable risk ≥ 0.25 for at least 1 indicator). H: High priority (i.e., attributable risk ≥ 0.1 for at least 1 indicator). M: Moderate priority (i.e., relative risk > 1). L: Low priority (relative risk ≤ 1). Physical habitat variable abbreviations are provided in Table 2-2. *Some chemistry variables are excluded because they had too few exceedances of thresholds to permit relative risk analysis.

Stressor	Priority	CSCI					D18					S2										
		RR	95% CI	AR	95% CI	n	RR	95% CI	AR	95% CI	n	RR	95% CI	AR	95% CI	n						
Chemistry																						
Nutrients																						
TP	VH	2.8	2.1	3.7	0.51	0.39	0.61	469	2.4	1.8	3.1	0.46	0.34	0.56	411	2.1	1.7	2.6	0.08	0.06	0.11	411
TN	VH	2.7	2.0	3.8	0.51	0.36	0.63	473	1.7	1.4	2.2	0.32	0.18	0.43	439	2.7	1.9	3.8	0.53	0.37	0.65	439
NH4	M	1.1	0.5	2.5	0.00	0.00	0.01	473	1.0	0.5	2.4	0.00	0.00	0.01	412	0.6	0.1	2.9	0.00	0.00	0.00	412
Metals																						
Se (d)	M	1.8	1.6	2.0	0.08	0.05	0.11	454	1.5	1.4	1.7	0.06	0.04	0.09	437	1.5	1.3	1.8	0.06	0.03	0.09	438
Cu (d)	M	1.7	1.6	1.8	0.00	0.00	0.01	428	1.6	1.5	1.7	0.00	0.00	0.00	435	1.7	1.5	1.8	0.00	0.00	0.00	437
Se (t)	M	1.5	1.3	1.7	0.06	0.03	0.09	441	1.4	1.2	1.6	0.05	0.02	0.08	450	1.4	1.2	1.6	0.05	0.02	0.08	452
Cu (t)	M	1.4	1.1	1.8	0.02	0.00	0.04	441	1.2	0.9	1.7	0.01	0.00	0.03	450	1.6	1.4	1.9	0.02	0.01	0.04	452
Pb (t)	L	0.8	0.5	1.3	0.00	0.00	0.01	441	0.6	0.4	1.1	0.00	0.00	0.00	450	1.0	0.7	1.4	0.00	0.00	0.02	452
Pyrethroids																						
Bifenthrin	M	1.6	1.4	1.9	0.09	0.05	0.13	415	1.4	1.2	1.7	0.06	0.03	0.10	423	1.5	1.2	1.7	0.07	0.03	0.10	425
Delta/ Tralomethrin	M	1.6	1.1	2.3	0.05	0.00	0.11	162	1.1	0.7	1.5	0.01	0.00	0.04	168	0.4	0.2	0.9	0.00	0.00	0.00	168
Cypermethrin	M	1.5	1.3	1.8	0.04	0.01	0.07	415	1.2	0.9	1.6	0.01	0.00	0.04	423	1.4	1.1	1.8	0.03	0.00	0.06	425
Cyfluthrin	M	1.4	1.2	1.8	0.03	0.00	0.06	415	1.3	1.0	1.7	0.02	0.00	0.04	423	1.3	0.9	1.7	0.02	0.00	0.04	425
Cyhalothrin	M	1.3	1.0	1.6	0.01	0.00	0.03	415	1.1	0.8	1.6	0.01	0.00	0.03	423	1.0	0.7	1.5	0.00	0.00	0.02	425
Esfenvalerate/ Fenvalerate	M	1.3	0.8	2.1	0.01	0.00	0.02	391	1.2	0.8	2.0	0.00	0.00	0.01	399	1.2	0.7	2.0	0.00	0.00	0.01	401
Permethrin	M	1.1	0.7	1.6	0.00	0.00	0.02	415	1.6	1.5	1.7	0.02	0.01	0.03	423	0.8	0.5	1.4	0.00	0.00	0.01	425
Other chemistry																						
TDS	VH	5.2	2.1	12.6	0.76	0.44	0.90	221	1.8	1.3	2.6	0.38	0.16	0.55	222	3.1	1.9	5.3	0.62	0.39	0.76	222
pH	H	1.9	1.7	2.1	0.12	0.08	0.16	593	1.2	1.0	1.5	0.03	0.00	0.07	492	1.6	1.4	1.8	0.08	0.05	0.12	491
Cl	H	1.9	1.6	2.1	0.14	0.09	0.19	489	1.3	1.1	1.5	0.05	0.01	0.09	436	1.1	0.9	1.3	0.02	0.00	0.06	437
SO4	VH	1.8	1.5	2.1	0.26	0.17	0.34	489	1.5	1.3	1.7	0.19	0.11	0.26	459	1.4	1.2	1.7	0.17	0.08	0.24	459
SpCond	H	1.7	1.5	1.9	0.14	0.10	0.18	603	1.5	1.3	1.7	0.13	0.08	0.18	494	1.5	1.3	1.8	0.13	0.08	0.18	493
TSS	H	1.7	1.4	2.0	0.14	0.08	0.19	485	1.3	1.1	1.6	0.07	0.03	0.12	422	1.2	1.0	1.4	0.04	0.00	0.10	423

Stressor	Priority	CSCI							D18					S2								
		RR	95% CI		AR	95% CI		n	RR	95% CI		AR	95% CI		n	RR	95% CI		AR	95% CI		n
Turbidity	H	1.5	1.2	1.8	0.10	0.04	0.16	379	1.2	1.0	1.5	0.06	0.00	0.12	292	0.9	0.7	1.2	0.00	0.00	0.05	289
PHAB																						
Biomass																						
PCT_MAP	H	1.5	1.3	1.8	0.15	0.08	0.21	433	1.3	1.1	1.5	0.08	0.02	0.14	432	1.5	1.3	1.7	0.14	0.08	0.19	431
PCT_CPOM	M	1.2	1.0	1.5	0.02	0.00	0.04	534	1.1	0.9	1.4	0.01	0.00	0.04	494	1.0	0.8	1.2	0.00	0.00	0.02	493
Chl a	M	1.2	0.9	1.4	0.03	0.00	0.07	495	1.2	1.0	1.4	0.03	0.00	0.06	480	1.3	1.1	1.5	0.05	0.02	0.09	479
PCT_MIAT1	M	1.1	0.9	1.5	0.01	0.00	0.04	470	0.9	0.7	1.2	0.00	0.00	0.01	469	0.8	0.6	1.2	0.00	0.00	0.01	468
XMIATP	M	1.1	0.9	1.5	0.01	0.00	0.04	470	0.9	0.7	1.2	0.00	0.00	0.01	469	1.0	0.7	1.3	0.00	0.00	0.02	468
AFDM	M	1.0	0.8	1.3	0.01	0.00	0.05	490	1.1	0.9	1.3	0.02	0.00	0.06	477	1.2	1.0	1.4	0.04	0.00	0.08	476
PCT_MCP	L	0.9	0.7	1.2	0.00	0.00	0.02	433	0.9	0.7	1.2	0.00	0.00	0.02	432	0.8	0.6	1.1	0.00	0.00	0.00	431
Substrate																						
PCT_BIGR	VH	3.1	2.5	3.9	0.51	0.42	0.59	568	2.0	1.7	2.4	0.34	0.26	0.42	494	2.0	1.7	2.4	0.35	0.26	0.42	493
Shannon_Subst rate	VH	2.4	2.1	2.7	0.27	0.21	0.32	568	1.4	1.2	1.7	0.11	0.05	0.16	494	1.6	1.4	1.8	0.14	0.09	0.19	493
XEMBED	M	1.3	0.9	1.9	0.04	0.00	0.08	432	1.5	1.3	1.9	0.04	0.01	0.07	374	1.7	1.3	2.3	0.04	0.02	0.07	372
PCT_SAFN	H	1.3	1.1	1.5	0.06	0.02	0.10	568	1.5	1.3	1.7	0.11	0.07	0.14	494	1.3	1.1	1.5	0.06	0.02	0.10	493
Instream habitat																						
XFC_NAT	VH	2.5	2.2	2.9	0.30	0.24	0.35	568	1.3	1.1	1.5	0.07	0.02	0.12	494	1.6	1.4	1.9	0.15	0.10	0.20	493
Shannon_Habit at	VH	2.3	2.0	2.6	0.28	0.22	0.34	568	1.3	1.1	1.5	0.09	0.04	0.15	494	1.6	1.4	1.9	0.17	0.11	0.22	493
PCT_FAST	H	1.7	1.4	1.9	0.14	0.09	0.19	536	1.3	1.1	1.5	0.07	0.02	0.11	494	1.3	1.1	1.5	0.07	0.02	0.11	493
Shannon_Flow	H	1.6	1.4	1.9	0.11	0.07	0.16	536	1.3	1.1	1.5	0.05	0.01	0.09	494	1.4	1.2	1.7	0.07	0.03	0.11	493
Riparian																						
W1_HALL	VH	3.0	2.5	3.6	0.47	0.40	0.54	534	1.8	1.5	2.1	0.25	0.18	0.32	494	1.8	1.6	2.1	0.26	0.19	0.33	493
XCMG	VH	2.4	2.1	2.7	0.30	0.25	0.36	537	1.4	1.2	1.6	0.11	0.06	0.16	494	1.5	1.3	1.8	0.14	0.09	0.20	493
XPMGVEG	VH	2.1	1.9	2.5	0.25	0.19	0.30	568	1.4	1.3	1.7	0.12	0.07	0.17	494	1.5	1.3	1.7	0.14	0.08	0.19	493
XPCMG	H	2.0	1.8	2.3	0.23	0.17	0.28	537	1.3	1.1	1.5	0.07	0.02	0.12	494	1.4	1.2	1.6	0.11	0.06	0.15	493
XCDENMID	H	1.9	1.7	2.3	0.22	0.16	0.28	551	1.2	1.0	1.4	0.05	0.00	0.10	478	1.3	1.1	1.5	0.08	0.03	0.14	477
Toxicity																						
Toxicity (lethal)	M	1.3	1.0	1.7	0.02	0.00	0.04	420	1.2	1.0	1.6	0.02	0.00	0.03	437	1.3	1.1	1.7	0.02	0.00	0.04	438
Toxicity (all endpoints)	M	1.0	0.8	1.2	0.00	0.00	0.05	420	1.2	1.0	1.4	0.05	0.00	0.11	437	1.0	0.8	1.2	0.01	0.00	0.06	438

Table 2-7. Summary of stressor prioritization.

Very high (AR > 0.25)	High (AR 0.1 to 0.25)	Moderate (RR >1)	Low (RR <1)
<u>Water Chemistry</u>	<u>Water Chemistry</u>	<u>Water Chemistry</u>	<u>Water Chemistry</u>
<i>Nutrients</i>	<i>Other chemistry</i>	<i>Nutrients</i>	<i>Metals</i>
TP	Cl	NH4	Pb (t)
TN	pH	<i>Metals</i>	<u>Habitat</u>
<u>Habitat</u>	TSS	As (t)	<i>Biomass</i>
<i>Instream habitat</i>	SpCond	Se (t, d)	PCT_MCP
XFC_NAT	<u>Habitat</u>	Cu (t, d)	
Shannon_Habitat	<i>Biomass</i>	<i>Pyrethroids</i>	
<i>Substrate</i>	PCT_MAP	Delta/Tralomethrin	
Shannon_Substrate	<i>Instream habitat</i>	Esfenvalerate/Fenvalerate	
PCT_BIGR	Shannon_Flow	Permethrin	
<i>Riparian</i>	PCT_FAST	Cyhalothrin	
XPMGVEG	<i>Substrate</i>	Cyfluthrin	
XCMG	PCT_SAFN	Cypermethrin	
W1_HALL	<i>Riparian</i>	Bifenthrin	
	XCDENMID	<u>Habitat</u>	
	XPCMG	<i>Biomass</i>	
		PCT_MIAT1	
		XMIATP	
		PCT_CPOM	
		AFDM	
		Chl a	
		<i>Substrate</i>	
		XEMBED	
		<u>Toxicity</u>	
		Reproduction	
		Survival	

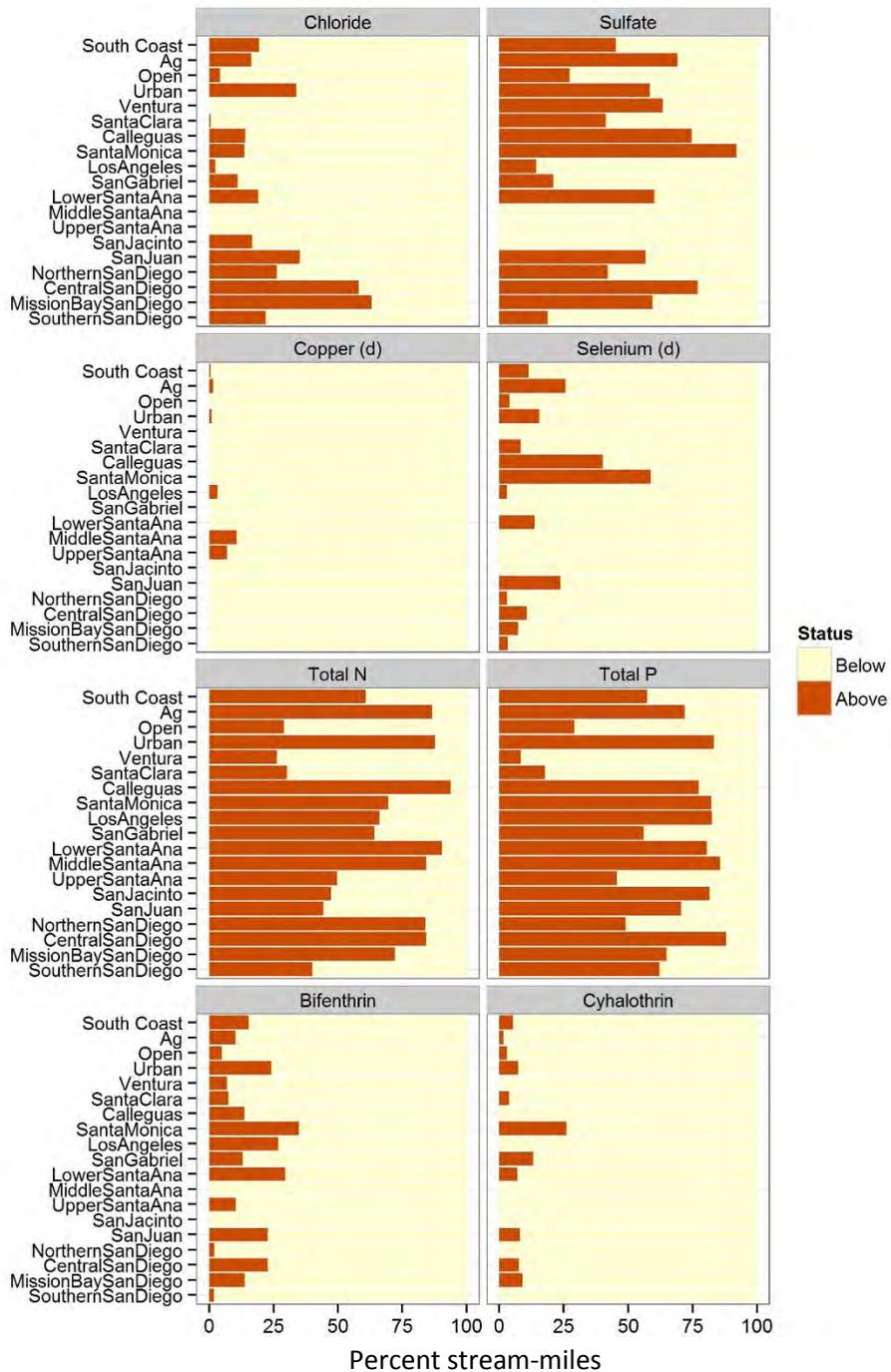


Figure 2-1. Extents of selected water-chemistry variables exceeding thresholds.

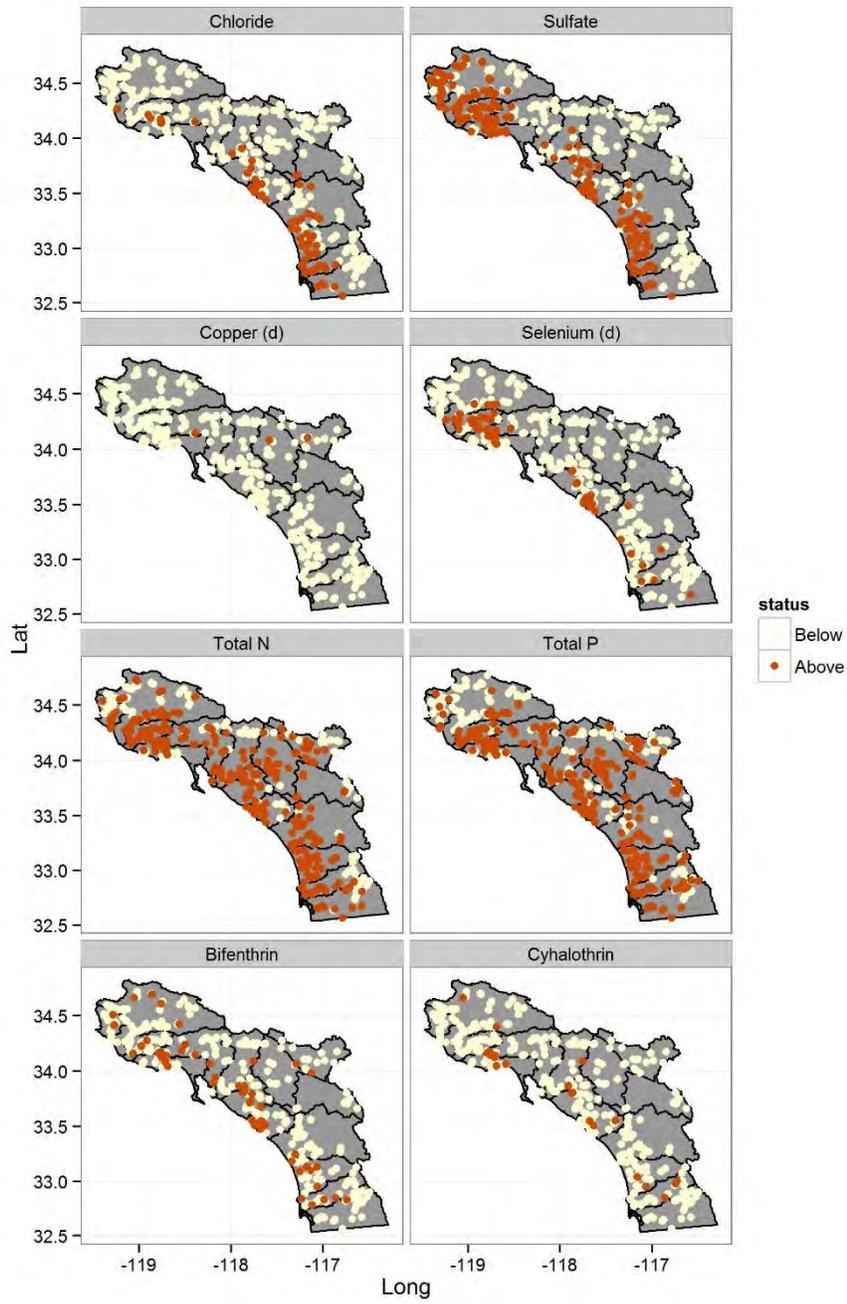


Figure 2-2. Maps of selected water-chemistry variables

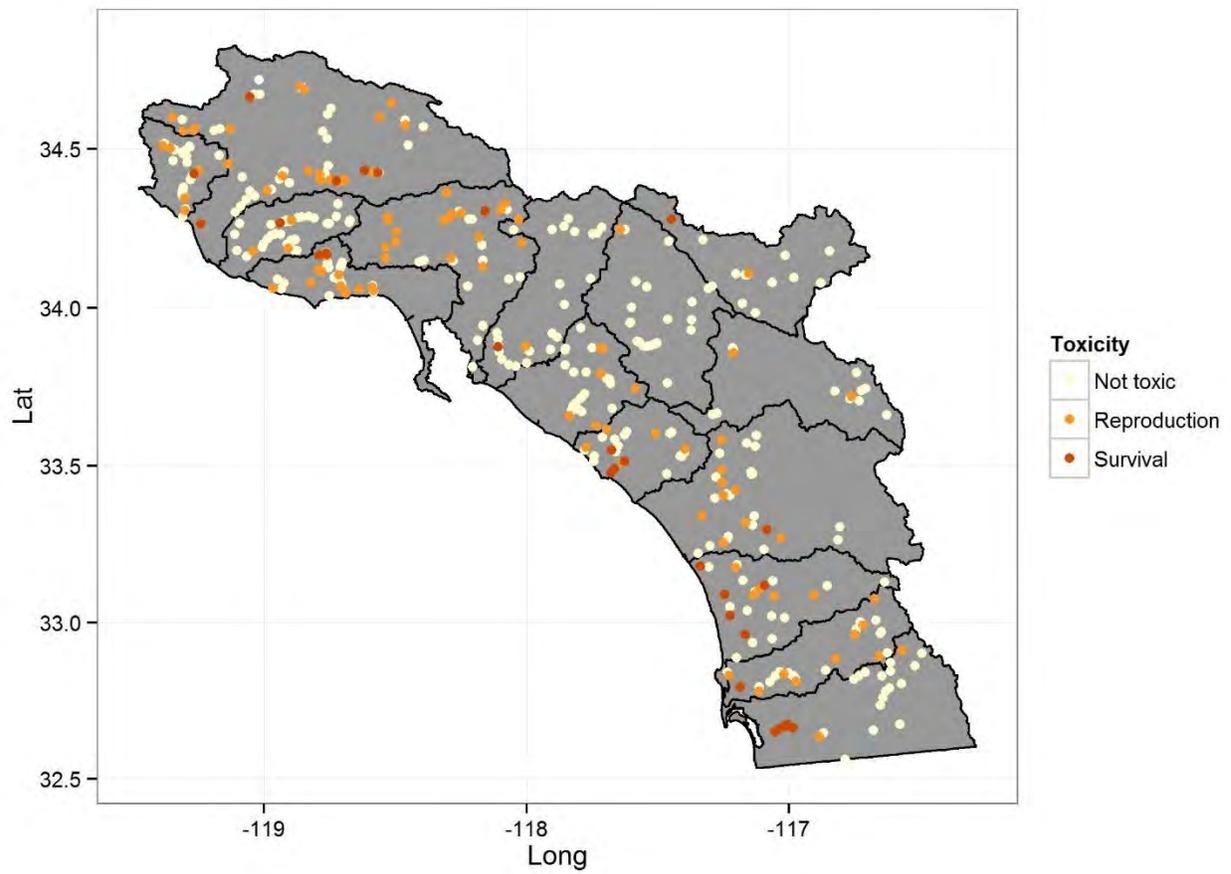


Figure 2-3. Map of toxicity.

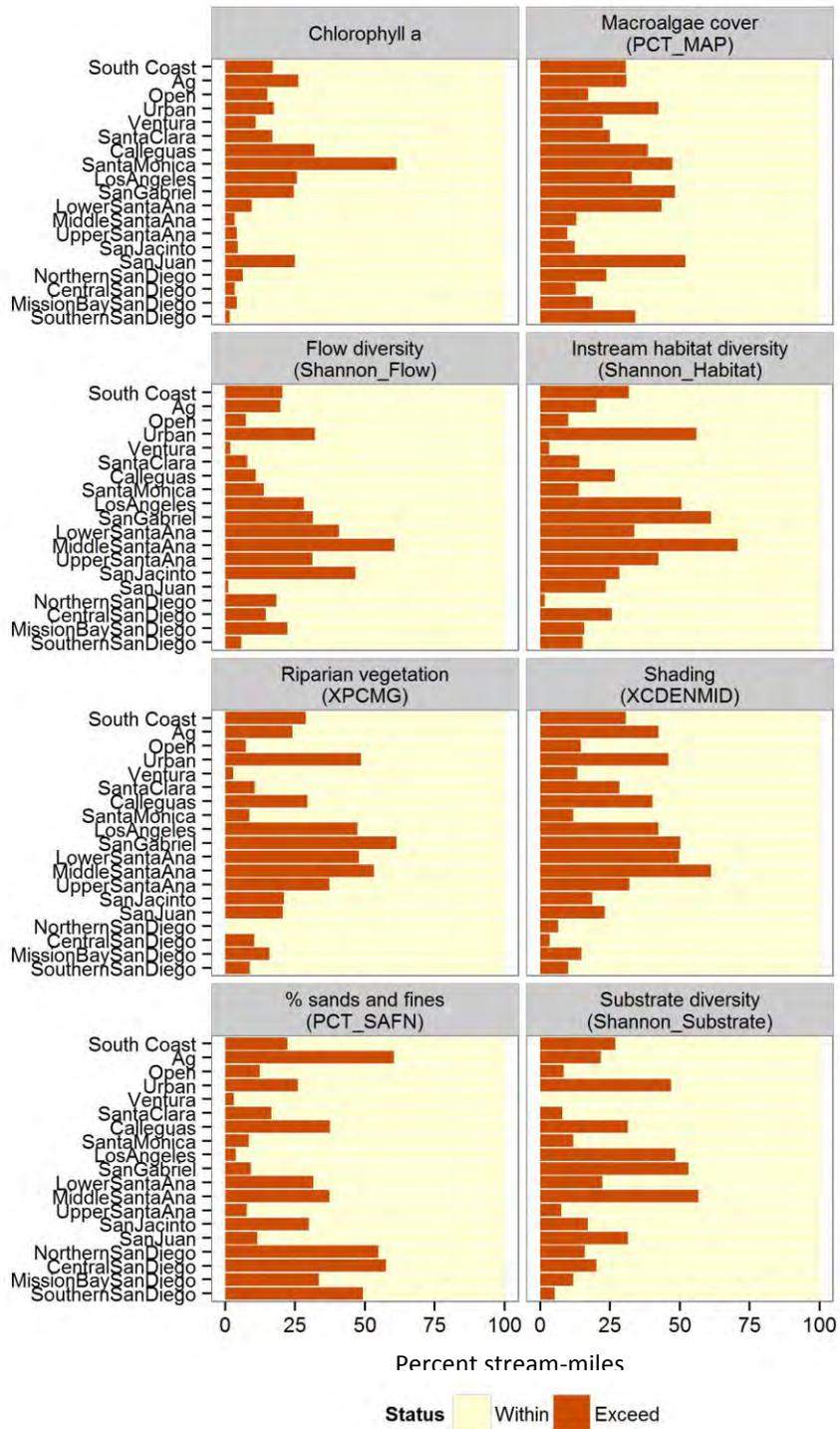


Figure 2-4. Extents of selected physical habitat variables.

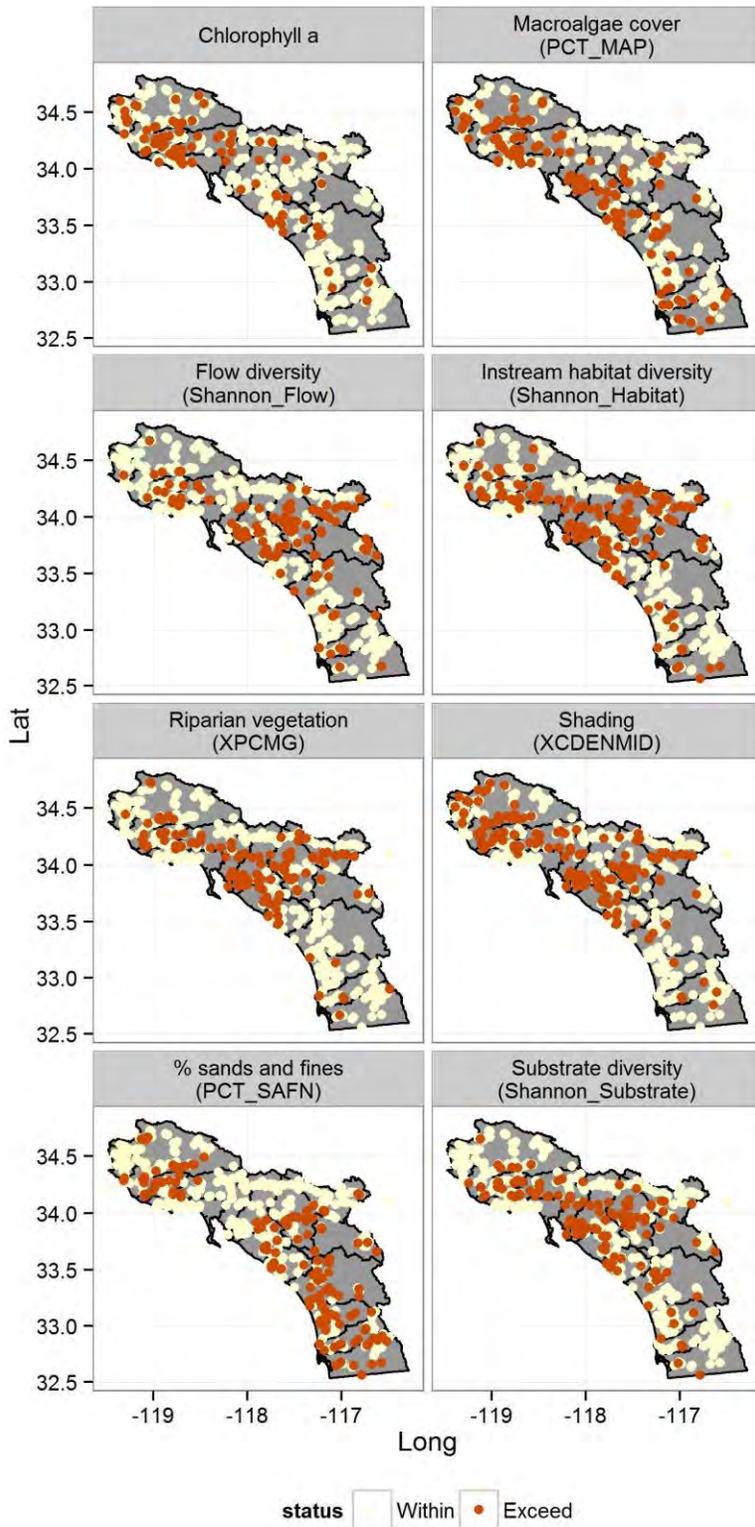


Figure 2-5. Map of selected physical habitat variables.

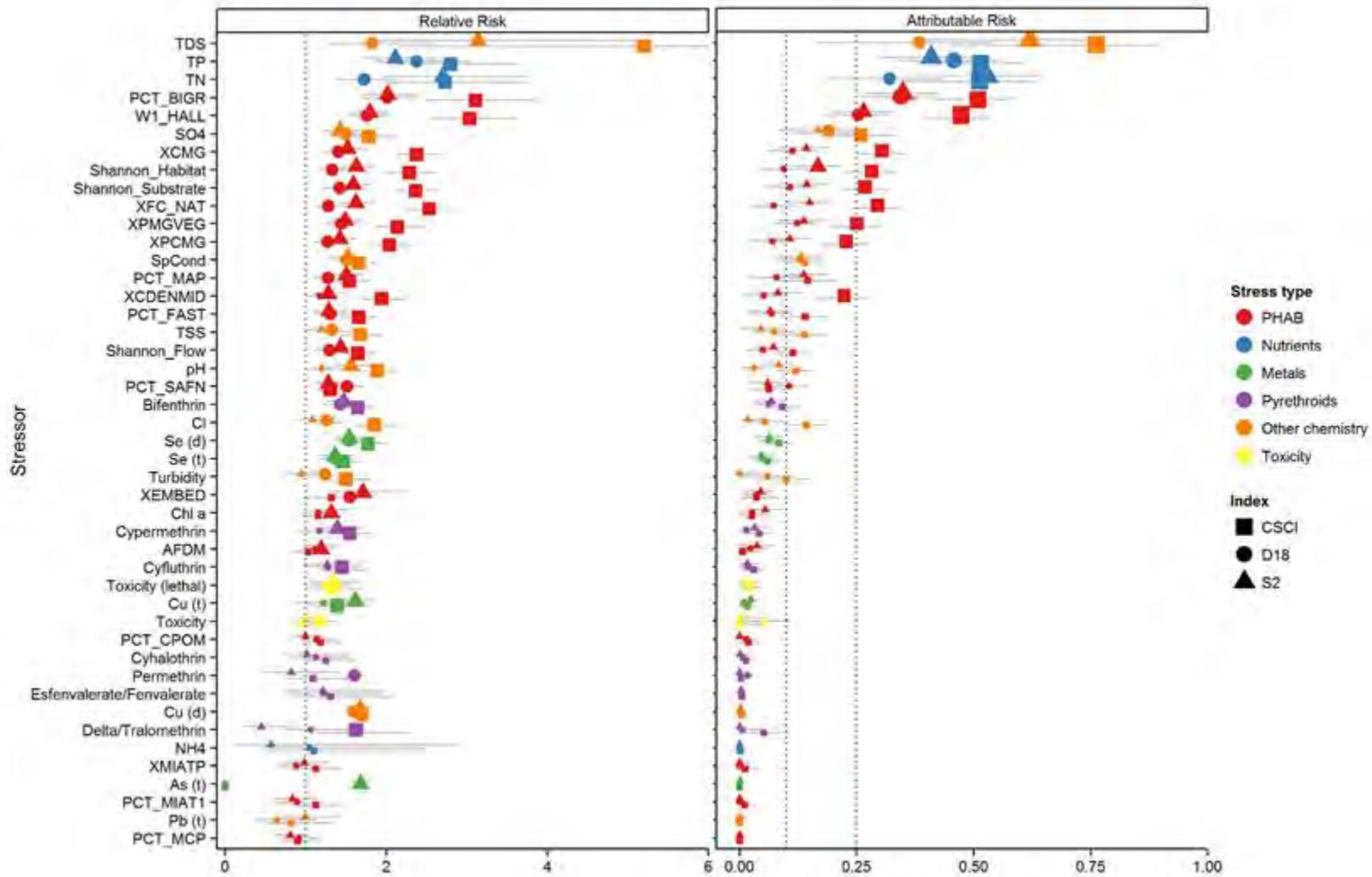


Figure 2.6. Relative and attributable risks. The horizontal lines represent the 95% confidence interval around each estimate. The dotted vertical lines represent the thresholds used to prioritize stressors.

QUESTION 3: HOW ARE BIOLOGICAL CONDITIONS CHANGING OVER TIME?



Murrieta Creek, Fall 2003



Murrieta Creek, Spring 2004

Changes in land use, such as the installation of a sand mining operation, can profoundly alter the habitat and degrade biological condition.

Photos by Scott Johnson.

Introduction

Analysis of trends allows managers to assess the effects of policies that have been implemented during the study period, the influence of disturbances like wildfire, or other activities that might change the biological condition of streams in the region. Changes observed in the region provide context to understanding site specific changes. For example, if conditions deteriorate in less disturbed areas (such as open streams), then degradation observed at an urban site might be attributable to regional stressors, such as climate change or atmospheric deposition of nutrients, rather than to management activities.

Methods

Data Collection

Data were collected as described in the Survey Overview.

Data Aggregation

Where multiple samples were collected at a single site within a year, data were aggregated as the maximum value within a site. Missing values were ignored for all relevant analyses, where appropriate.

Thresholds

Thresholds were applied as described in the section on Question 1.

Weighted Magnitudes and Extent Estimates

Weighted estimates were calculated as described in the section on Question 1, using each year (or year within land use class) as a stratum. Extents of streams in each condition class were estimated for the CSCI, S2, D18, and CRAM. In addition, the extent of streams intact for all indicators was estimated as well.

Results

All data used in this report can be downloaded from <ftp.sccwrp.org/pub/download/SMCReport/SMCDataFor5yearReport.zip>.

Since 2009, no obvious trends were evident for any indicator, although all indicators showed a slight depression in scores in the year 2010 (Tables 3-1 and 3-2; Figure 3-1). The median score for the CSCI, S2, and CRAM fluctuated between Class 2 and 3, while D18 fluctuated between Class 3 and 4. The percent of streams that were intact for all four indicators was highest (at 36%) in 2012, but was only 14% in 2010 (Figure 3-2). Most of the fluctuations in score affected the open streams, while the extent of healthy agricultural and urban streams remained low throughout the survey (Table 3-1, 3-2). Extent estimates were particularly imprecise for agricultural streams, as in some years very few of these sites were sampled (e.g., 5 agricultural sites were sampled for all indicators in 2011 and 2012), leading to erratic confidence intervals

(Figure 3-1). Although CSCI scores were generally high in the earlier years of the survey, these estimates were based on very small sample sizes (<25 sites in any year), and should be interpreted with caution.

Discussion

We were unable to detect trends in condition. Our inability to detect trends stems from the relatively short time frame of the survey (i.e., 5 years), as well as a study design that did not include site revisits over multiple years. These two characteristics of the survey make it difficult to distinguish trends from natural variation driven by climate or other factors. Given that a different set of sites was examined each year, the regional focus of the program, and that only five years of data are presented, it is not surprising that no distinct trends were observed. For a trend at this regional scale to be evident, a longer time period would be required and/or site revisits. It is possible that site-specific management activities affecting stream health were within the sample frame, but may have been obscured by the overall regional focus. Revisiting sites sampled in early years of this survey would provide site-specific trend estimates, which could then provide a better estimate of trends across the region. Additionally, we would be able to explore potential drivers of any observed trends.

Table 3-1. Medians for key indicators by year.

Subpopulation	2009	2010	2011	2012	2013
South Coast					
CSCI	0.71	0.70	0.81	0.80	0.65
D18	55	50	54	59	57
S2	37	34	39	43	50
CRAM	71	62	72	69	67
Agricultural					
CSCI	0.70	0.74	0.79	0.79	0.71
D18	49	49	67	61	37
S2	25	17	17	41	38
CRAM	64	66	66	74	72
Open					
CSCI	0.95	0.77	0.93	0.95	0.96
D18	75	67	68	71	75
S2	83	75	52	68	61
CRAM	82	78	83	82	84
Urban					
CSCI	0.65	0.52	0.61	0.67	0.53
D18	52	41	41	39	35
S2	33	26	27	33	48
CRAM	56	45	40	37	52

Table 3-2. Percent of stream-miles within the 10th percentile of scores at reference sites for each year

Subpopulation	2009	2010	2011	2012	2013
South Coast					
CSCI	41	28	56	52	36
D18	41	35	38	45	43
S2	34	41	36	44	59
CRAM	46	34	50	48	39
Multiple indicators	23	14	24	36	31
Agricultural					
CSCI	42	39	47	35	39
D18	28	19	61	33	42
S2	15	4	19	28	17
CRAM	25	36	35	77	51
Multiple indicators	2	8	0	40	22
Open					
CSCI	84	46	88	87	82
D18	70	62	60	71	79
S2	70	86	54	84	72
CRAM	87	70	91	85	89
Multiple indicators	57	34	51	83	79
Urban					
CSCI	8	12	19	17	7
D18	20	24	17	26	20
S2	11	23	19	12	58
CRAM	23	13	12	15	11
Multiple indicators	1	4	0	1	3

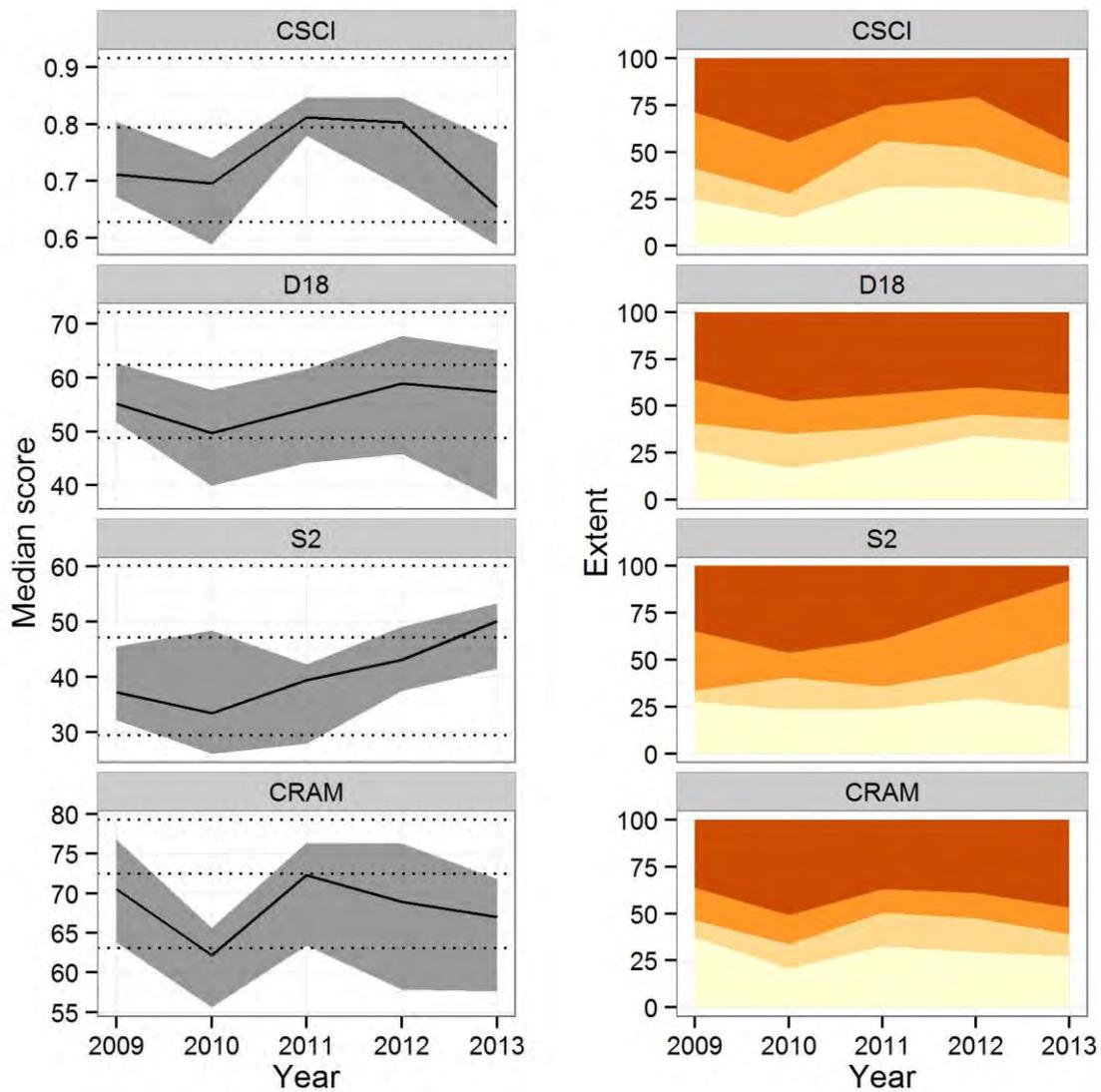


Figure 3-1. Median score and extent of condition classes by year for each indicator. The gray band in the left panel indicates the 95% confidence interval. Color in the right panel indicates condition class; lighter colors indicate better condition.

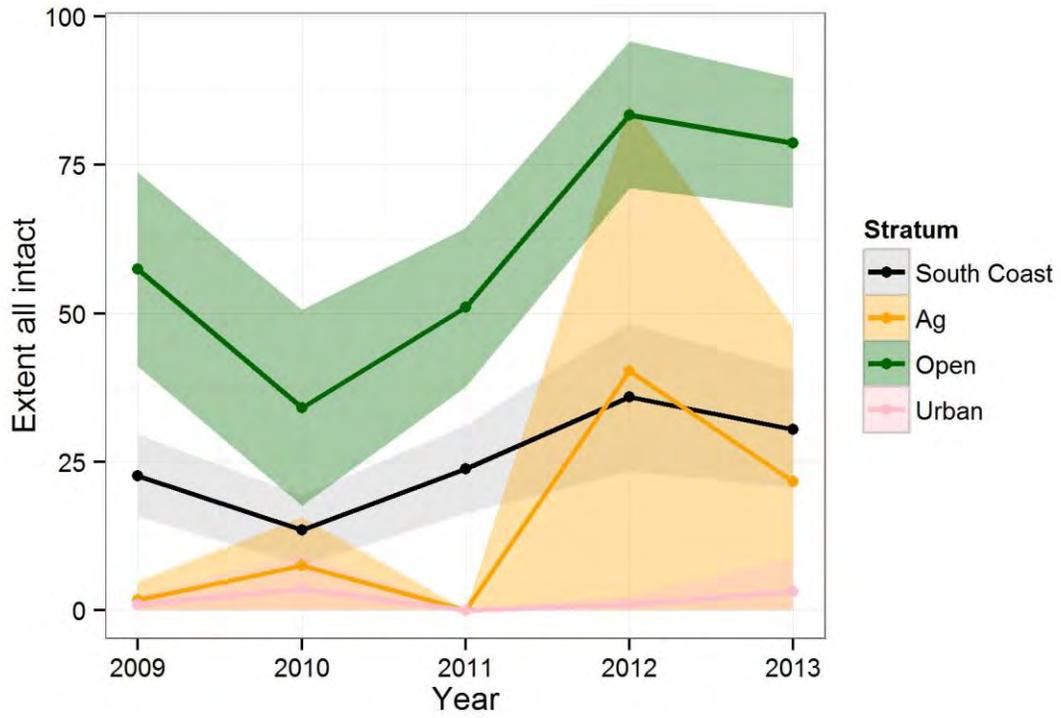


Figure 3-2. Percent of stream-miles that were intact for all four indicators

RECOMMENDATIONS

- Continue the survey for another five years, focusing on key biological indicators of stream condition, as well as high-priority stressors.
- Expand the survey to include nonperennial streams.
- Improve trend estimates by revisiting previously sampled probabilistic sites.
- Continue to investigate high priority stressors, such as habitat degradation and nutrient enrichment.
- Support studies that identify constraints on biological condition imposed by natural factors, channel engineering, water chemistry, and habitat degradation.

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ATTACHMENT 65



QuickFacts

selected: Ventura County , California

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more .

Table

All Topics	Ventura County , California
Population estimates, July 1, 2016, (V2016)	849,738
PEOPLE	
Population	
Population estimates, July 1, 2016, (V2016)	849,738
Population estimates base, April 1, 2010, (V2016)	823,387
Population, percent change - April 1, 2010 (estimates base) to July 1, 2016, (V2016)	3.2%
Population, Census, April 1, 2010	823,318
Age and Sex	
Persons under 5 years, percent, July 1, 2016, (V2016)	6.1%
Persons under 5 years, percent, April 1, 2010	6.7%
Persons under 18 years, percent, July 1, 2016, (V2016)	23.6%
Persons under 18 years, percent, April 1, 2010	25.7%
Persons 65 years and over, percent, July 1, 2016, (V2016)	14.6%
Persons 65 years and over, percent, April 1, 2010	11.7%
Female persons, percent, July 1, 2016, (V2016)	50.5%
Female persons, percent, April 1, 2010	50.3%
Race and Hispanic Origin	
White alone, percent, July 1, 2016, (V2016) (a)	84.5%
Black or African American alone, percent, July 1, 2016, (V2016) (a)	2.3%
American Indian and Alaska Native alone, percent, July 1, 2016, (V2016) (a)	1.8%
Asian alone, percent, July 1, 2016, (V2016) (a)	7.6%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2016, (V2016) (a)	0.3%
Two or More Races, percent, July 1, 2016, (V2016)	3.4%
Hispanic or Latino, percent, July 1, 2016, (V2016) (b)	42.5%
White alone, not Hispanic or Latino, percent, July 1, 2016, (V2016)	45.8%
Population Characteristics	
Veterans, 2011-2015	44,586
Foreign born persons, percent, 2011-2015	22.8%
Housing	
Housing units, July 1, 2016, (V2016)	286,864
Housing units, April 1, 2010	281,695
Owner-occupied housing unit rate, 2011-2015	64.2%
Median value of owner-occupied housing units, 2011-2015	\$458,100
Median selected monthly owner costs -with a mortgage, 2011-2015	\$2,387
Median selected monthly owner costs -without a mortgage, 2011-2015	\$522
Median gross rent, 2011-2015	\$1,507
Building permits, 2016	1,609
Families & Living Arrangements	
Households, 2011-2015	268,969
Persons per household, 2011-2015	3.08
Living in same house 1 year ago, percent of persons age 1 year+, 2011-2015	87.5%
Language other than English spoken at home, percent of persons age 5 years+, 2011-2015	38.5%
Education	
High school graduate or higher, percent of persons age 25 years+, 2011-2015	83.1%
Bachelor's degree or higher, percent of persons age 25 years+, 2011-2015	31.7%
Health	
With a disability, under age 65 years, percent, 2011-2015	6.5%
Persons without health insurance, under age 65 years, percent	▲ 9.9%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2011-2015	66.1%
In civilian labor force, female, percent of population age 16 years+, 2011-2015	59.7%
Total accommodation and food services sales, 2012 (\$1,000) (c)	1,597,442
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	3,987,634
Total manufacturers shipments, 2012 (\$1,000) (c)	8,333,976
Total merchant wholesaler sales, 2012 (\$1,000) (c)	D

Total retail sales, 2012 (\$1,000) (c)	11,194,185
Total retail sales per capita, 2012 (c)	\$13,390
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2011-2015	25.8
Income & Poverty	
Median household income (in 2015 dollars), 2011-2015	\$77,348
Per capita income in past 12 months (in 2015 dollars), 2011-2015	\$33,435
Persons in poverty, percent	▲ 9.9%
 BUSINESSES	
Businesses	
Total employer establishments, 2015	20,602
Total employment, 2015	257,011
Total annual payroll, 2015 (\$1,000)	13,635,301
Total employment, percent change, 2014-2015	2.2%
Total nonemployer establishments, 2015	67,736
All firms, 2012	76,285
Men-owned firms, 2012	39,995
Women-owned firms, 2012	26,682
Minority-owned firms, 2012	25,161
Nonminority-owned firms, 2012	48,210
Veteran-owned firms, 2012	5,861
Nonveteran-owned firms, 2012	67,137
 GEOGRAPHY	
Geography	
Population per square mile, 2010	446.7
Land area in square miles, 2010	1,843.13
FIPS Code	06111

Value Notes

 This geographic level of poverty and health estimates is not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info  icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2016) refers to the final year of the series (2010 thru 2016). Different vintage years of estimates are not comparable.

Fact Notes

- (a) Includes persons reporting only one race
- (b) Hispanics may be of any race, so also are included in applicable race categories
- (c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

- Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper interval of an open ended distribution.
- D Suppressed to avoid disclosure of confidential information
- F Fewer than 25 firms
- FN Footnote on this item in place of data
- NA Not available
- S Suppressed; does not meet publication standards
- X Not applicable
- Z Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

ATTACHMENT 66

Mobile Detailers

Do you know where the water goes?



The "DON'T DUMP !" signs are placed next to storm drains to remind everyone that gutters and storm drains carry rain as well as any pollutants directly to arroyos, creeks and the ocean without any treatment.

Disposing of cleaning solutions or soapy water into gutters and storm drains can harm or kill wildlife, even if it's labeled nontoxic or biodegradable. Wastewater from vehicle and equipment cleaning needs to be treated. This can be accomplished by natural filtration or

- Only Wash in Specially Designated Areas. Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or drainage areas can pollute the storm drain system.
- Vacuum up any Remaining Wastewater.
- Pay Close Attention to the Amount and Type of Chemicals You Use. Never use engine degreasers or toxic wheel cleaners. These products typically contain petroleum based solvents and may be highly corrosive.
- If You Must Use a Detergent, make sure it is Phosphate Free and Biodegradable. It is a common misconception that a phosphate free, biodegradable detergent is completely safe for the environment. Any detergent can impact the environment. Many professional auto detailers do not use detergents.
- Use as Little Water as Possible. Limiting the amount of wash and rinse water reduces the possibility of wastewater runoff. Unpermitted wastewater discharges are prohibited by local ordinance.
- Don't let the Wash or Rinse Water Run Off the Site!

Pollution Fact Sheet/Business - Vehicle / 1999



Washing Your Vehicle

Do you know where the water goes?



The "DON'T DUMP !" signs are placed next to storm drains to remind everyone that gutters and storm drains carry rain as well as any pollutants directly to arroyos, creeks and the ocean without any treatment.

Washing vehicles and equipment outdoors where wash water flows onto paved surfaces or disposing of cleaning solutions or soapy water into gutters and storm drains can pollute and harm or kill wildlife, *even if the cleaning solution is labeled nontoxic or biodegradable.*

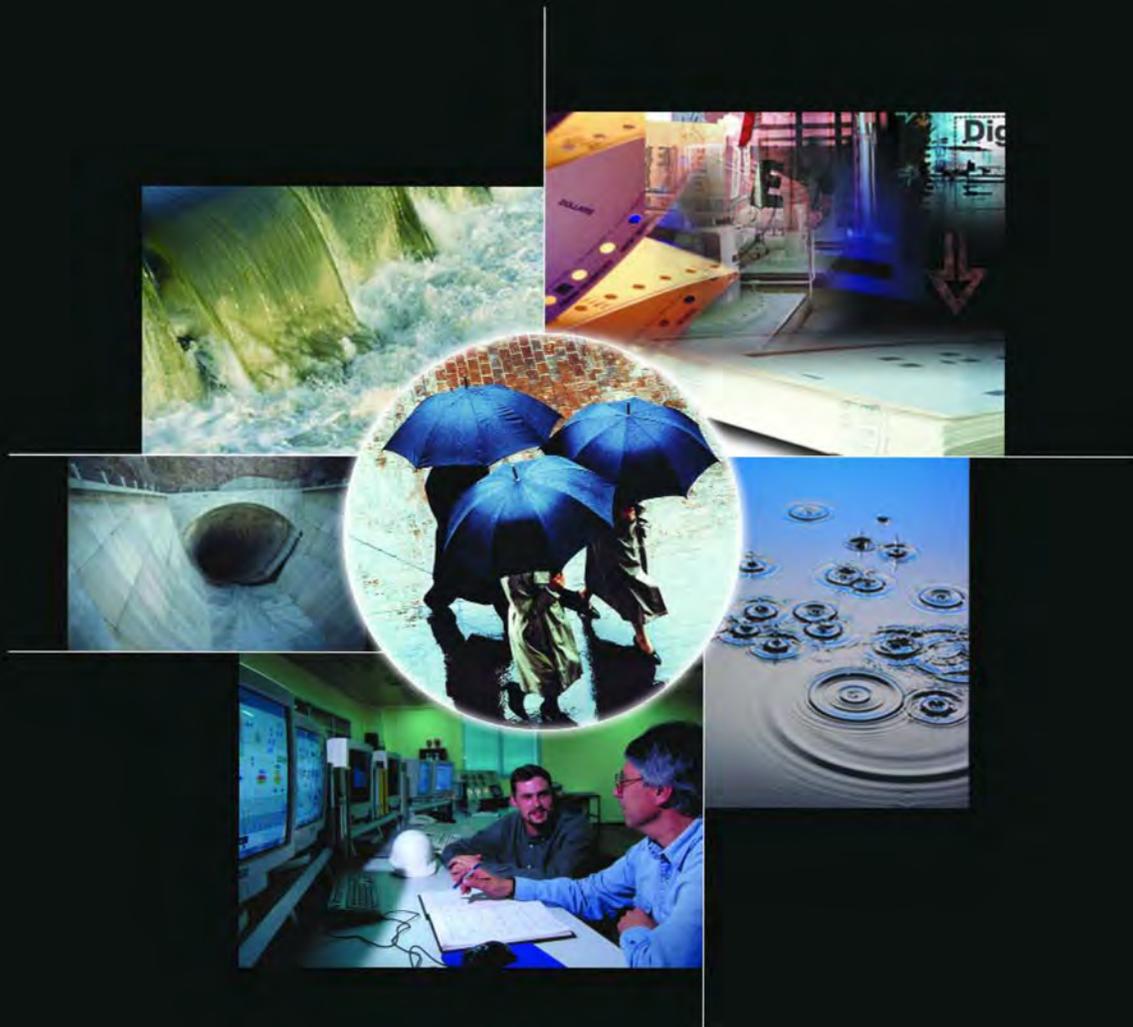
- Why not use a Commercial Car Wash? Commercial car washing facilities are designed to re-use water whenever possible and discharge any wastewater into the sanitary sewer, where it is treated before being discharged to the environment. Whenever possible, take your car to a self or full serve commercial car wash.
- Pay Close Attention to the Amount and Types of Chemicals You Use. Never use engine degreasers, tar removers, or toxic wheel cleaners. These products typically contain petroleum based solvents and may also be highly corrosive. They can create safety hazards for both the environment and for human health. Read the label when you purchase any cleaning product and buy the least hazardous product to protect you, your car, and your family.
- If you must use Detergent, make sure it is Phosphate Free and Biodegradable. It is a common misconception that a phosphate free, biodegradable detergent is completely safe for the environment. Any detergent can impact the environment.
- Use as Little Water as Possible. Don't let your garden hose run when you are not using it. Remember, the more clean water you use, the more wastewater you generate.
- Don't let Wash or Rinse Water Run Off the Site!

Pollution Fact Sheet/General Public - Vehicle / 1999



ATTACHMENT 67

2005 STORMWATER UTILITY SURVEY



BLACK & VEATCH
building a **world** of difference™

ENERGY WATER INFORMATION GOVERNMENT

Black & Veatch is pleased to provide the results of its sixth national Stormwater Utility Survey, to help those involved in the stormwater industry stay well-informed across a range of issues. The survey results offer insight into the following topics:

- Organization/Administration
- Planning
- Operations
- Finance/Accounting
- Stormwater User Fees and Billing
- Quality Issues – Best Management Practices
- Public Information/Education
- Major Challenges Recently Faced
- Significant Events Affecting Utilities

These results can be used for numerous purposes, from performance management to financial planning to organization strengthening. At Black & Veatch, we understand the value of knowing what others are doing in the industry. For 90 years, meeting the needs of the utility industry has been at the core of our business. We are happy to discuss any questions you might have regarding this survey.

Profile of Respondents

- Responses were received from 99 utilities in 21 states and one Canadian province. All of these utilities are funded in whole or in part through user fees.
- Approximately 86 percent of the respondents serve a city, rather than a county or region.
- The population served by the respondents ranges from 1,400 (Atlantic Beach, FL) to 3.9 million people (Los Angeles, CA) and the area served varies from 3 to 1,500 square miles. Eighty-one percent indicate they are responsible for stormwater facilities only, while the balance report they are responsible for combined sanitary/stormwater facilities. Approximately 88 percent indicate that they use their own staff to provide a majority of operation and maintenance services.
- For those utilities that base charges on gross property area, equivalent residential units ranged from 1,600 square feet total area to 11,000 square feet, with a mean of 6,964 square feet. For those utilities that base charges on impervious area, impervious areas per equivalent residential unit ranged from 1,500 square feet to 10,000 square feet, with a mean of 2,647 square feet.

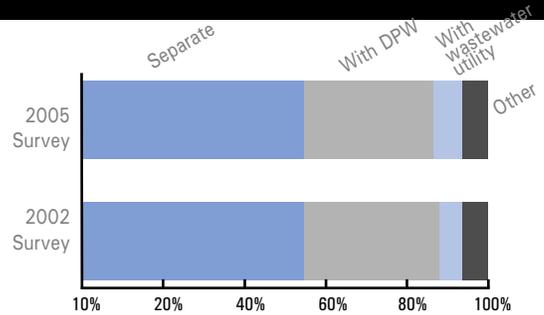
What's New

Feedback from participants prompted us to add a new question to the 2004-2005 version of the Stormwater Utility Survey. In recent years, a number of stormwater treatment systems have become commercially available. Fifty-six percent of respondents have installed at least one of these devices with the most popular being Stormceptor, StormFilter, and CDS Separator. Thirty-six percent have had a favorable experience with these devices in terms of treatment efficiency and ease of maintenance, while 41 percent are still in the evaluation process.

Organization / Administration

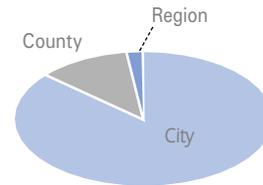
Q How is your operation organized?

- 55% Separate utility
- 32% Combined with Department of Public Works
- 7% Combined with wastewater utility
- 6% Other



Q What area does your utility serve?

- 86% Within city limits
- 12% County
- 2% Region



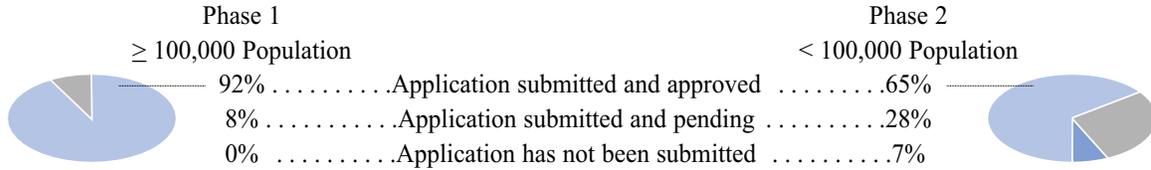
Q Does your state have specific statutes that govern the formation of stormwater utility and user fee financing?

- 71% Yes
- 29% No



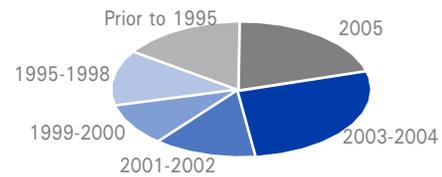
Planning

Q What is the status of your NPDES permit?



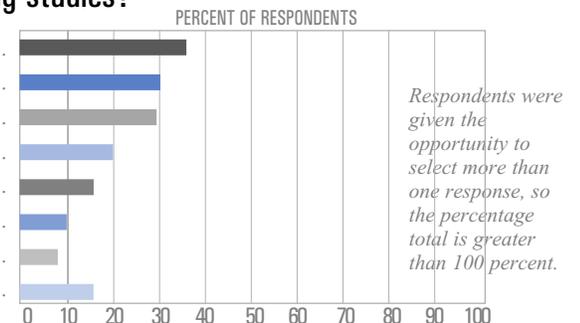
Q When was your most recent stormwater plan or stormwater facilities plan?

- 21% 2005
- 27% 2003–2004
- 13% 2001–2002
- 10% 1999–2000
- 13% 1995–1998
- 16% Prior to 1995



Q What stormwater computer models do you use for planning studies?

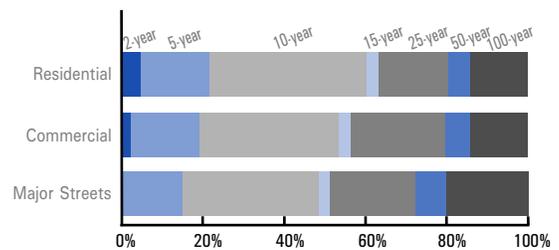
- 36% HEC-2
- 30% XP-SWMM
- 29% HEC-1
- 20% TR-55
- 16% EPA SWMM
- 10% HEC-RAS
- 7% HEC-HMS
- 15% Other



Planning (continued)

Q What return periods do you use to design your major stormwater structures?

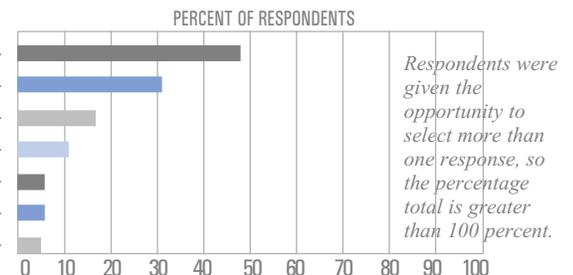
	Residential	Commercial	Major Streets
2-year	3%	1%	0%
5-year	18%	17%	14%
10-year	39%	35%	34%
15-year	3%	3%	3%
25-year	17%	23%	21%
50-year	6%	7%	8%
100-year	14%	14%	20%



Several respondents provided a range of return period. The percentages above represent the smallest return period provided.

Q Which performance indicators do you consider most important in measuring improvement in stormwater management success?

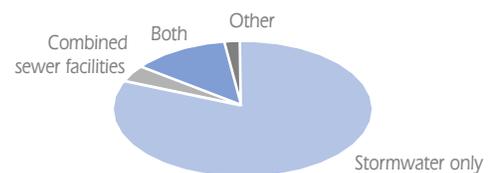
47%	Flood control
31%	Monitoring pollutants
17%	Customer complaints/satisfaction
11%	Cost control measures
6%	Erosion control
6%	Maintenance
5%	Habitat



Operations

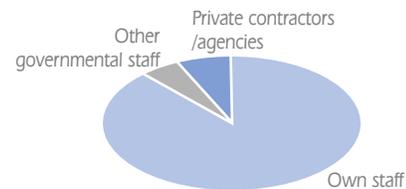
Q What is your utility responsible for?

81%	Stormwater facilities only
4%	Combined sewer (sanitary/stormwater) facilities
13%	Both
2%	Other



Q Who provides the majority of your O&M services?

88%	Own Staff
5%	Other Governmental Staff
7%	Private contractors/agencies

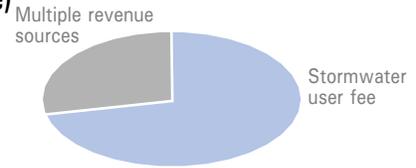


Finance/Accounting

Q What are your major (at least 90 percent of total income) revenue sources?

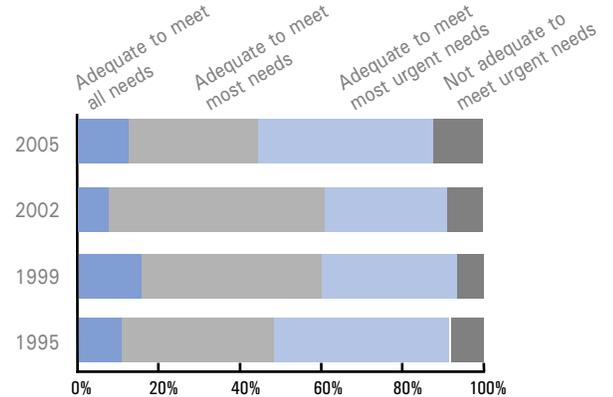
(Excludes 7 utilities that reported no single major source)

- 72% Stormwater user fee
- 28% Multiple revenue sources



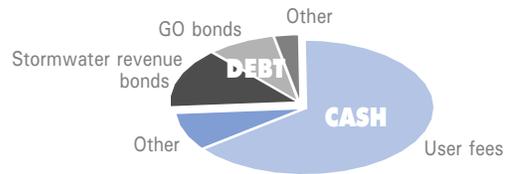
Q How adequate is available funding?

- 13% Adequate to meet all needs
2002 = 8% • 1999 = 16% • 1995 = 11%
- 32% Adequate to meet all needs
2002 = 53% • 1999 = 44% • 1995 = 38%
- 43% Adequate to meet most urgent needs
2002 = 30% • 1999 = 34% • 1995 = 44%
- 12% Not adequate to meet urgent needs
2002 = 9% • 1999 = 6% • 1995 = 7%



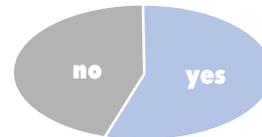
Q How is the majority of capital improvement needs financed?

- 74% Cash financed
 - 65% From user fees
 - 0% From ad valorem taxes
 - 9% Other
- 26% Debt financed
 - 14% Stormwater revenue bonds
 - 9% General obligation bonds
 - 0% Combined bonds
 - 3% Other



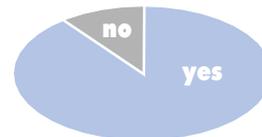
Q Does your accounting system permit cost tracking by operating activity (e.g., inlet cleaning)?

- 55% Yes
- 45% No



Q Does your accounting system identify user fee revenues by customer class (e.g., residential)?

- 89% Yes
- 11% No

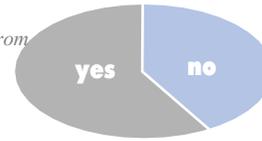


Stormwater User Fees and Billing

Q Were your rates revised in the last 12 months?

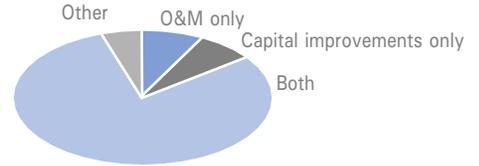
- 41% No
- 59% Yes

Increases ranged from 1% minimum to 117% maximum



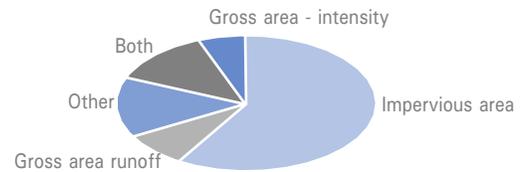
Q What are your user fees designed to pay for?

- 8% Operation and maintenance (O&M) expenses only
- 7% Capital improvements only
- 80% Both O&M expenses and capital improvements
- 5% Other



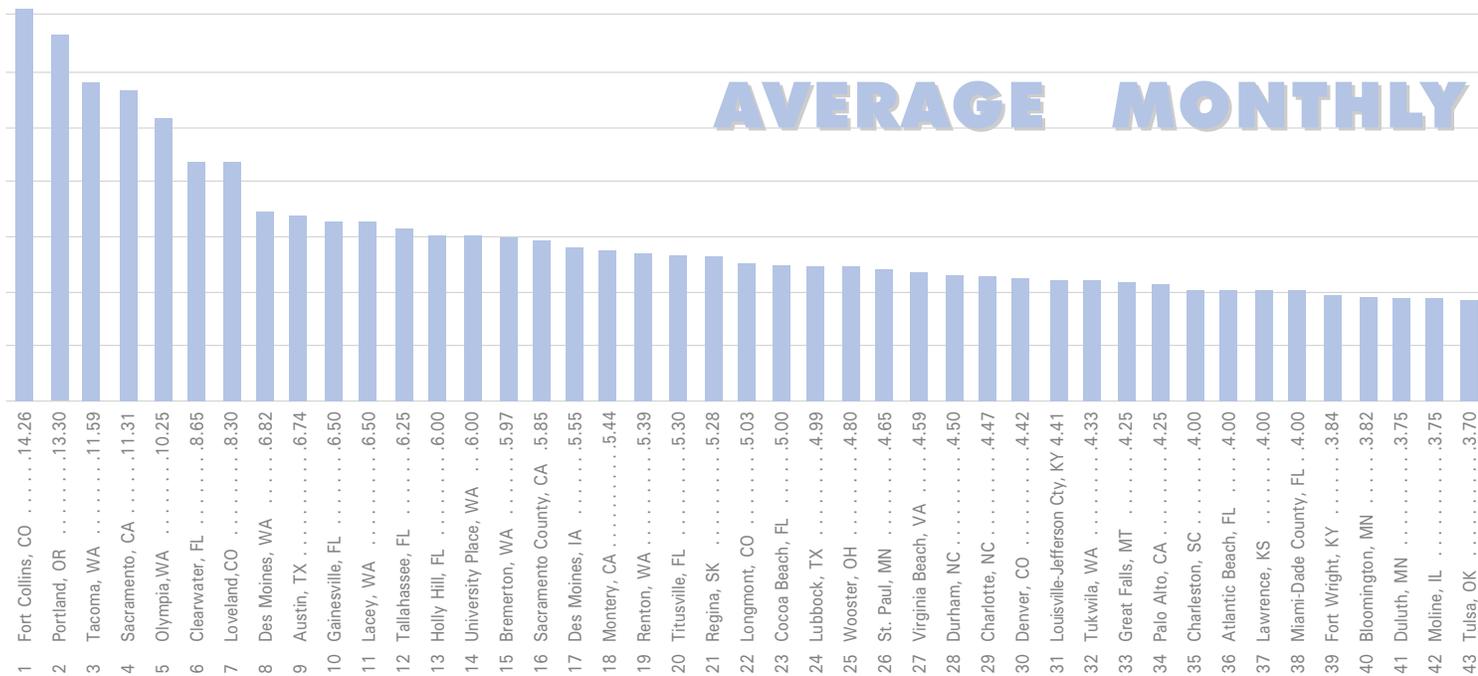
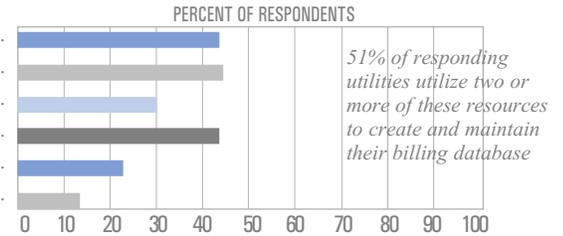
Q What is the basis for your user fees?

- 59% Impervious area
- 8% Gross area with intensity of development factor
- 14% Both impervious and gross areas
- 13% Other (e.g., number of rooms, water use, flat fee)
- 6% Gross area with runoff factor



Q If user fees are area-based, what principal resources were employed to create and maintain the customer database used to compute charges?

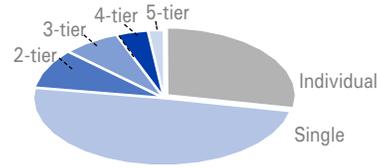
- 42% Property tax assessor records
- 43% Aerial photographs
- 29% On-site property measurement
- 42% Geographic Information System (GIS)
- 22% Planimetric map take-offs
- 13% Other (e.g., building permits, site plans)



Q Are your stormwater charges based on individual or class average characteristics?

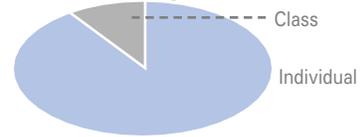
Residential

- 27% Individual parcel
- 73% Class average as:
 - 48% Single tier
 - 9% 2-Tier rate
 - 7% 3-Tier rate
 - 4% 4-Tier rate
 - 2% 5-Tier rate



Non-Residential

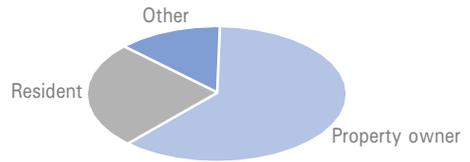
- 90% Individual parcel
- 10% Class average



3% of respondents who answered class average did not provide the number of rate tiers.

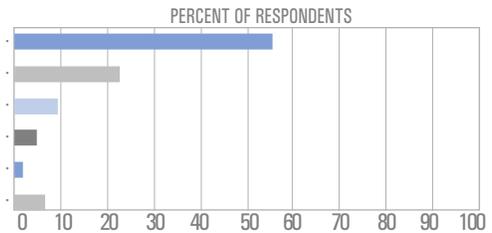
Q Who is responsible for the payment of user fees?

- 62% Property owner
- 25% Resident
- 13% Other (e.g., water or other utility bill recipient)

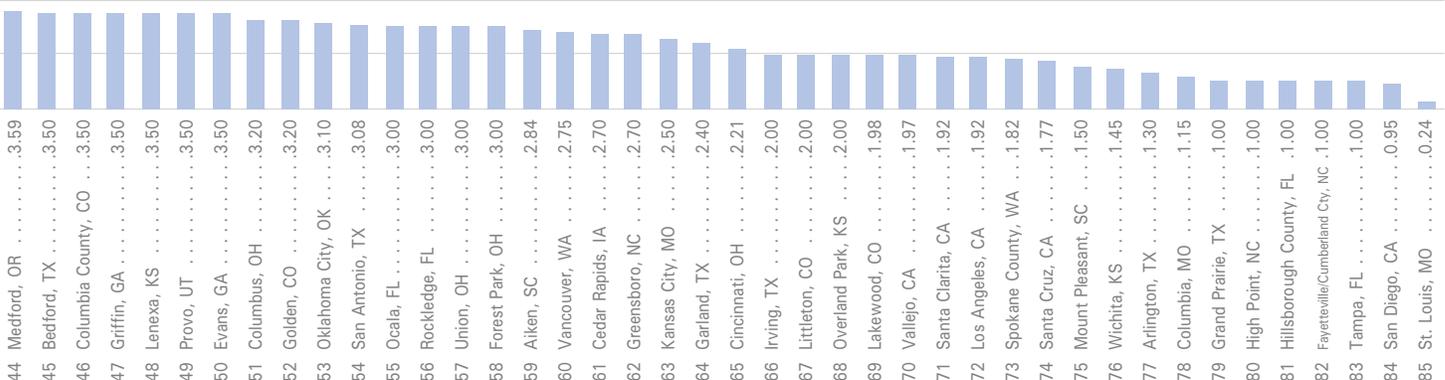


Q How frequently do you bill?

- 56% Monthly
- 22% Annually
- 9% Bi-monthly
- 5% Quarterly
- 2% Semi-annually
- 6% Other



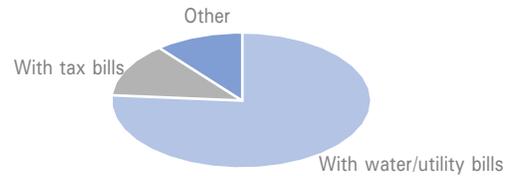
RESIDENTIAL CHARGE



Stormwater User Fees and Billing (continued)

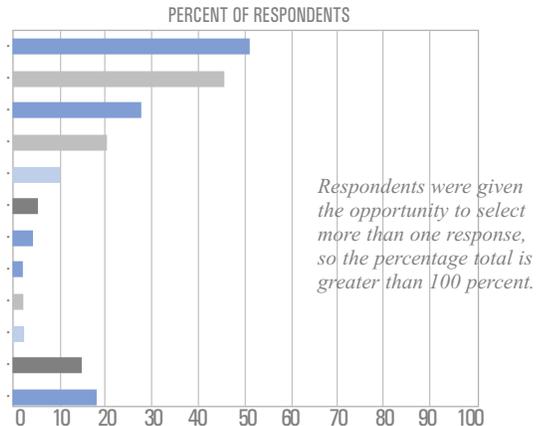
Q How are your user fees billed?

- 76% With water or other utility bills
- 13% With tax bills
- 11% Other



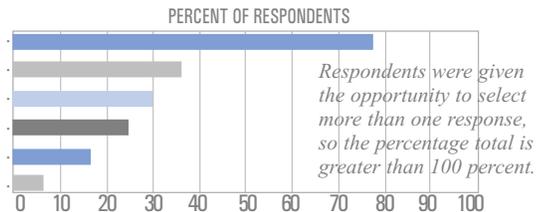
Q What types of properties are exempt from user fees?

- 51% Streets/highways
- 46% Undeveloped land
- 27% Rail rights-of-way
- 20% Public parks
- 10% Government
- 5% School districts
- 4% Churches
- 2% Airports
- 2% Colleges/universities
- 2% Water front
- 14% None
- 17% Other



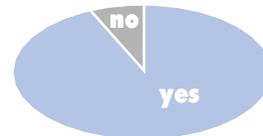
Q What customer classifications are recognized in your stormwater fee structure?

- 77% Residential
- 36% Commercial
- 30% Combined commercial/industrial
- 25% Other
- 17% Industrial
- 7% No designation



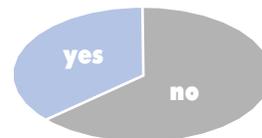
Q Are rates the same for all service areas or watersheds?

- 93% Yes
- 7% No



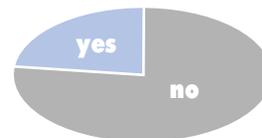
Q Are your user fees for single family dwellings the same as for individual multiple residential units, such as apartments and condominiums?

- 64% No
- 36% Yes



Q Are one-time impact/capital recovery fees applied to new stormwater utility customers or new development?

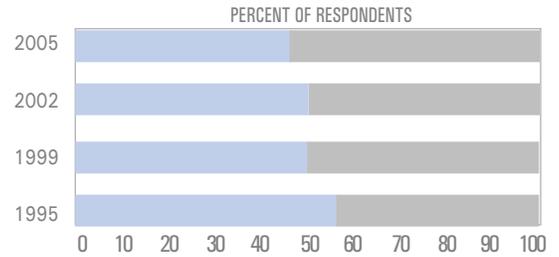
- 77% No
- 23% Yes



2004–2005 Stormwater Utility Survey

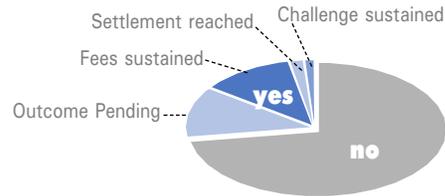
Q Are credits provided for private detention/retention facilities?

46% Yes
 2002 = 53% • 1999 = 50% • 1995 = 57%
 54% No



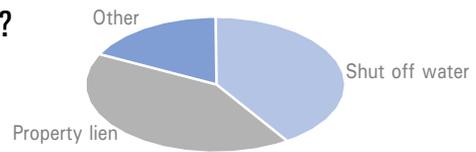
Q Have your user fees faced a legal challenge?

72% No
 28% Yes
 12% Outcome pending
 12% Fees sustained
 2% Settlement reached
 1% Challenge sustained (2 later remedied by legislation)



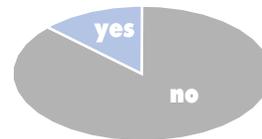
Q On what basis is payment of your user fees enforced?

41% Lien on property
 42% Shut off water
 18% Other



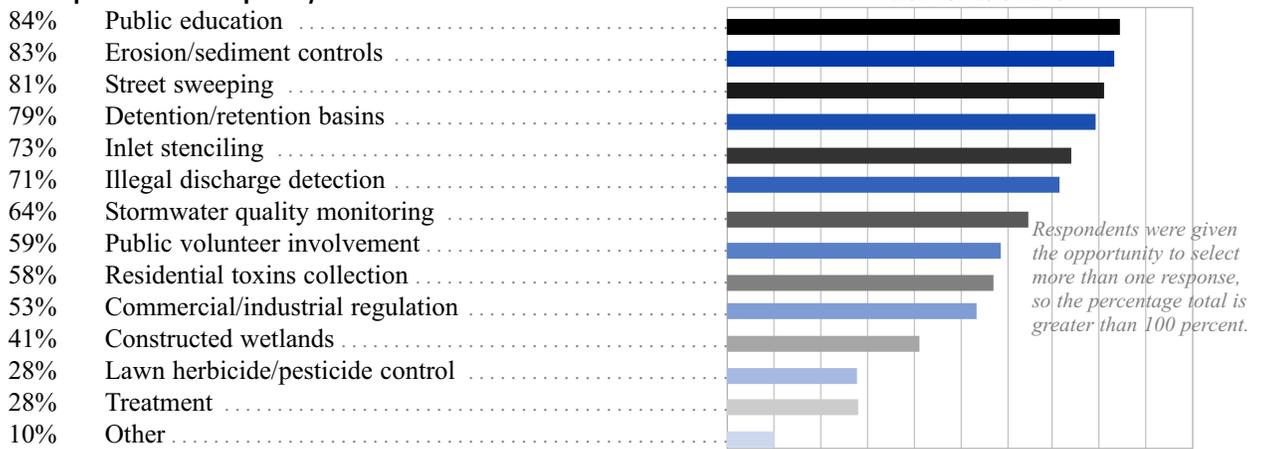
Q Is a significant share of your utility costs attributable to stormwater from outside your service area?

87% No
 13% Yes



Quality Issues – Best Management Practices

Q Which programs and practices are being used to protect or improve water quality?



Quality Issues Best Management Practice (continued)

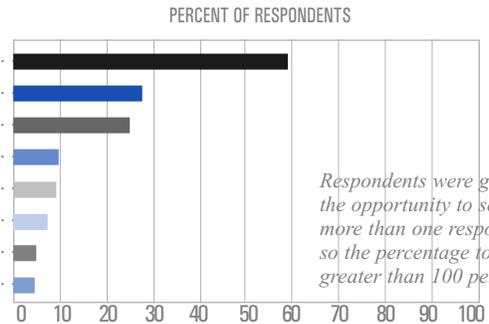
Q Have you installed any stormwater treatment systems in your stormwater conveyance system?

55% Yes
45% No



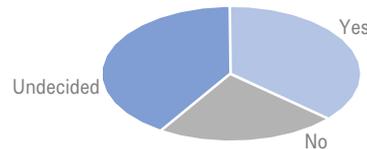
Devices installed:

59% Stormceptor
28% CDS Separator
24% StormFilter
9% Downstream Defend
9% Vortechincs
7% Bay Saver
4% Abtech
4% SunTree Technologies



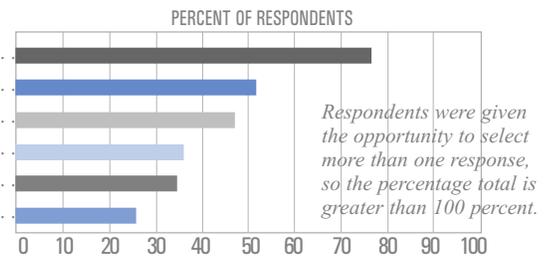
Have these devices met your expectations?

36% Yes
23% No
41% Undecided



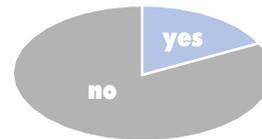
Q What contaminants are your greatest concern?

76% Sediments
51% Nutrients
47% Oil and grease
35% Heavy metals
34% Pesticides
25% Other



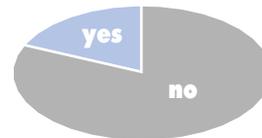
Q Are quality-based user fee credits or other incentives provided to encourage customers to control or reduce stormwater pollution?

18% Yes
82% No



Q Are your user fees specifically designed to provide for the separate recognition and equitable recovery of costs associated with stormwater quality management and quantity(runoff) management, respectively?

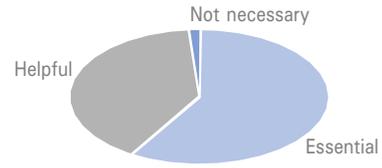
81% No
19% Yes



Public Information/Education

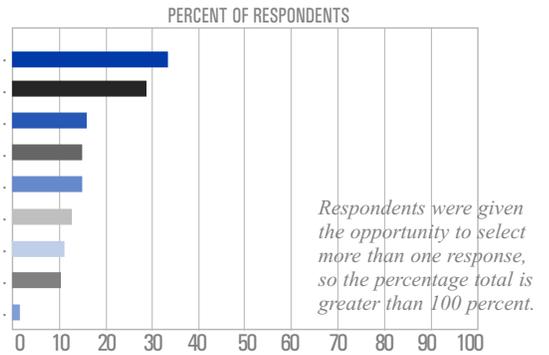
Q How important is an organized public information/education effort to the continuing success of a user fee funded stormwater utility?

- 59% Essential
- 40% Helpful
- 1% Not necessary



Q What means have you found to be the most effective in educating the public about utility services, program needs and financing, and citizen responsibilities?

- 33% Bill inserts
- 29% Public hearings/presentations
- 16% Internet
- 15% Brochures/flyers/newsletters
- 15% Newspaper
- 12% Television
- 11% Public schools
- 10% Speakers bureau
- 1% Direct mail



Major Challenges Recently Faced

Financial, rate, and billing related issues (e.g., financing growth, capital replacements, NPDES and other environmental mandates; rate increases, rate equitability, rate challenges; and billing database updating or conversion to GIS)	19 utilities
Weather and flooding issues (e.g., high amounts of rainfall, standing water, West Nile concerns, localized flooding)	10 utilities
Erosion control (e.g., run-off, erosion problems)	8 utilities
Regulatory and quality control compliance (e.g., illicit discharges, quality monitoring, and difficulties of complying with more stringent state and federal quality mandates related to Endangered Species Act, TMDLs, et al.)	8 utilities
Infrastructure planning issues (e.g., need for integrated flood, quality and environmental planning; remedy of specific infiltration/inflow or local flooding problems; and system-wide flood control master planning)	7 utilities
Jurisdictional issues (e.g., incorporation of added cities into service area and co-permittee coordination)	3 utilities
Public education (e.g., need for increased education regarding new programs or rate increases)	2 utilities

Significant Events Affecting Utilities in Past Two Years

NPDES compliance	21 utilities
CIP related (funding, projects started/completed)	14 utilities
User fee related (increases, lack of increases)	14 utilities
Weather related (heavy rains, storms, drought)	8 utilities
Organization/administration/staffing changes	7 utilities
Public education/awareness	4 utilities
Urban growth/decline in service area	4 utilities
Legal challenges	2 utilities

Some respondents listed the same events as positive, negative, or both (e.g., heavy rains or flooding brought both damage and increased public awareness of needs).

Stormwater Management

From run-off to potential revenue stream, stormwater management is uniquely challenging. It is often not source-specific, not metered or monitored closely within the community, and not tied to customers' daily decisions.

Black & Veatch's Enterprise Management Solutions team assists utilities nationwide in stormwater management issues to help provide stable funding for operations as well as capital projects.

ABOUT ENTERPRISE MANAGEMENT SOLUTIONS

Black & Veatch is pleased to provide this survey as an industry service. For 90 years, meeting the needs of utilities nationwide has been at the core of our business. We understand the value of knowing how others are addressing the industry's complex issues. From organization effectiveness to financial structuring to risk management, it helps to know the industry's trusted business partner. Black & Veatch brings it all together.



BLACK & VEATCH
building a **world** of difference™

ENERGY WATER INFORMATION GOVERNMENT

For custom strategies, proven processes and high-value results, contact:

Anna White

Black & Veatch • 11401 Lamar Avenue • Overland Park, KS 66211 USA

Tel: 913-458-4322

Stormwater@bv.com

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ATTACHMENT 68

Ventura County Watershed Protection District

**Report on
Benefit Assessment Program
For
Watershed Protection**



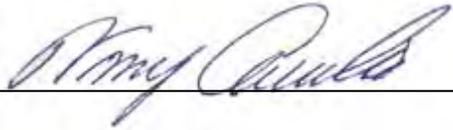
**Fiscal Year
2010/2011**

FOREWORD

the Benefit Assessment Program to finance their respective activities related to reducing the discharge of storm water pollutants, which will result in a substantial impact to fiscal resources levied through the Benefit Assessment Program.

In addition, a portion of the benefit assessment monies collected each year are held in reserve in case of future disaster. Floods, wildfires, erosion, and mud/debris flows all have the potential to cause extensive damage to District facilities. While a Presidential disaster declaration makes federal and State relief monies available for the repair and restoration of existing facilities and for mitigation measures to avoid future damage, significant District resources are required as local match. Funds held in reserve ensure that the District has the resources necessary to quickly recover from a disaster.

This report describes the District's Benefit Assessment program for FY 2010-11. It contains a description of the mechanics of calculating fees and defines the manner in which fee revenue may be spent and, by reference, includes the official benefit assessment roll as approved by the District's Board of Supervisors. A serious disparity continues to exist between revenues and the cost of operations and maintenance of flood mitigation facilities. Continued shortfalls in revenue required the Ventura County Watershed Protection District's Benefit Assessment Program be continued for fiscal year 2011.



Norma J. Camacho, Director
Ventura County
Watershed Protection District

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I. EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

The Ventura County Watershed Protection District Benefit Assessment (BA) Program is authorized by the Ventura County Watershed Protection District Act, as amended by Chapter 438, Statutes of 1987 and Chapter 365, Statutes of 1988. The FY2011 Benefit Assessment for Watershed Protection is based on the rates established for Fiscal Year 1997. Those same rates were approved for Fiscal Years 1998-1999 through 2009-2010. They were approved again in compliance with Proposition 218 on June 08, 2010 for fiscal year 2010-2011.

This Report presents the continuation of the BA Program to supplement insufficient existing revenues for financing routine operation and maintenance of District facilities and the Countywide Stormwater Quality Management Program. Additionally, this report outlines the benefit assessment component that sets aside reserve funds in Zones 1, 2, and 3 for flood damage repair.

The population of Ventura County has increased from approximately 200,000 people in 1960 to about 792,313 in 2010², a figure that may climb to over 874,000 by 2015³. The growth associated with this projected population increase will result in additional impervious surfaces and increased runoff. There will likely be pressures to locate new developments in flood hazard areas. New watershed protection facilities constructed by developers and the District will be required, and the subsequent increases in maintenance costs will tax already limited revenues.

Due to the unpredictable nature of the winter weather in Ventura County and frequently experienced flood damage, periodic increases in assessments have been necessary to cover the cost of damage repair. Between 1988 and 1995, three temporary assessment increases were levied to cover shortfalls in O&M funding and State and Federal reimbursements.

In June 1995, a Flood Damage Repair Reserve was established as a precautionary measure to fund future emergency repairs. The intent was to offset future flood damage repair costs while minimizing the fluctuations in BA rates. Due to the magnitude of the 2005 federally declared disaster, all Flood Damage Repair funds were exhausted before June 30, 2005 for necessary repairs. Replenishment of this Reserve component will ensure that the District has funds available to repair damaged facilities and to implement mitigation measures in a timely manner.

In addition, water quality plays an important role in Ventura County, with its 42 miles of coastline and three major watersheds (Calleguas Creek, Santa Clara River, and Ventura River). Each river system within the county represents an important resource for recreation, water supply and natural habitat. The State of California has required, through an NPDES Permit, the programs to protect the water quality in these watersheds and provide for water quality monitoring. That responsibility lies with the Ventura Countywide Stormwater Quality Management Program. The program represents a joint effort between the District, the County of Ventura, and the Cities of Camarillo, Fillmore,

2. http://www.dof.ca.gov/research/demographic/documents/ACS2009_05_STCOPL_Extract.xls

3. <http://www.ventura.org/rma/planning/pdf/demographics/VCOG/pop.pdf>

Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley, and Thousand Oaks.

The ultimate goal of the program, which is funded in part with BA monies, is to reduce pollutants in the waters of Ventura County to the maximum extent practicable.

With the issuance of a third term NPDES Permit on May 7, 2009, there have been substantial increases to permit requirements. Some of the more significant additional requirements include inspection of industrial facilities, inspection of construction sites and far more expansive water quality monitoring. Even with these additional requirements there has been no increase to the Benefit Assessment rate.

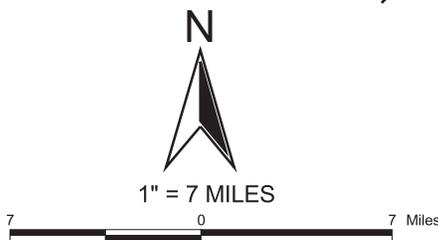
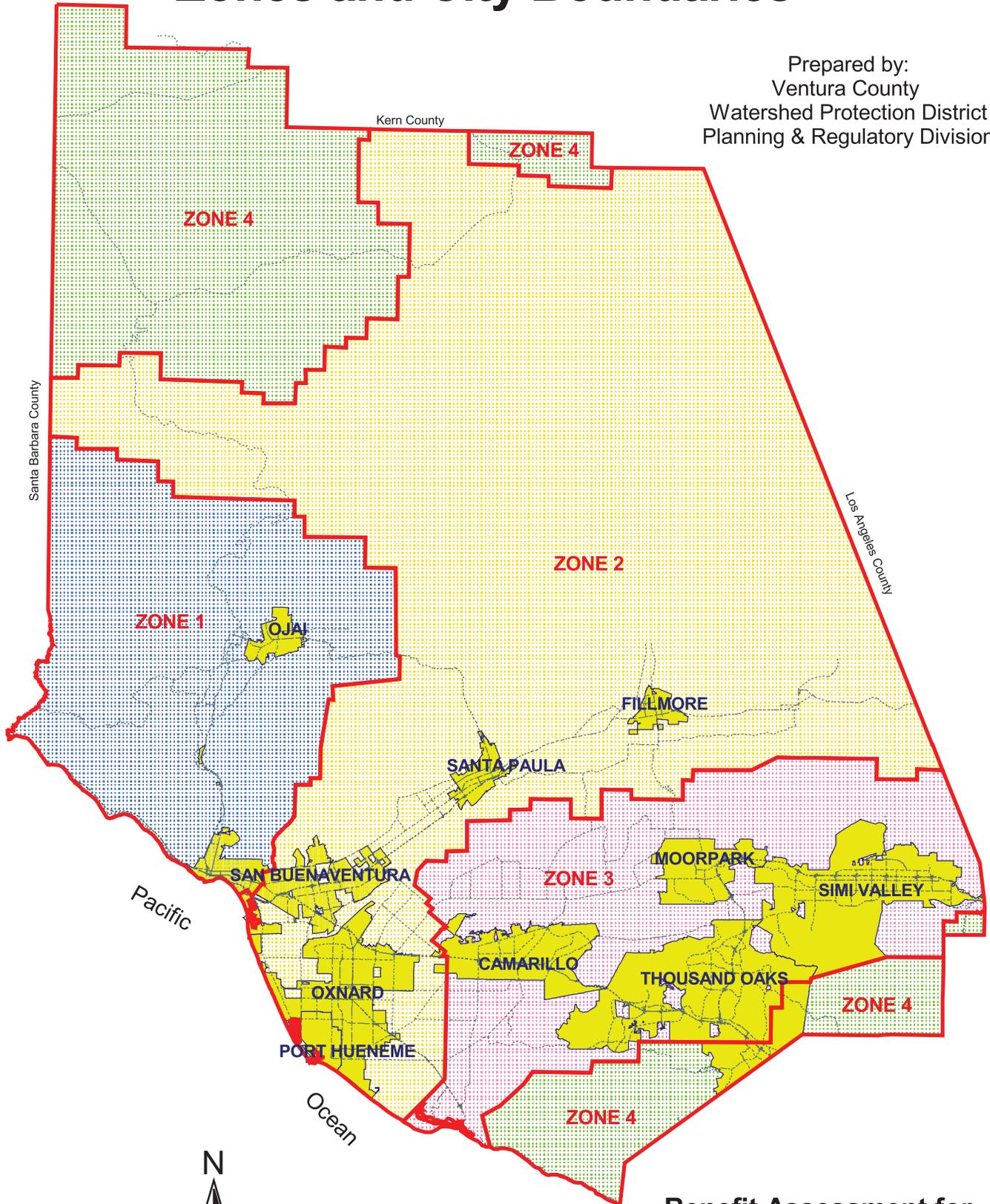
This Report on BA Program for Watershed Protection contains the following:

A "needs assessment" which provides a cost/revenue analysis outlining the financial need for a benefit assessment program and describes existing and potential District facilities and services to be financed with BA revenues

- An extensive discussion of the existing BA Program methodology and formulas used in determining assessments.
- Assessment formula and impervious factors relating to assessor site use codes (Appendix A)
- Assessment Roll for FY 2011, as approved by the County of Ventura Board of Supervisors, including the parcel number and amount of assessment for each parcel (Appendix B available in digital format under separate cover)
- Resolutions approved for FY 2011 by various City Councils (Appendix C - available under separate cover)

Ventura County Watershed Protection District Zones and City Boundaries

Prepared by:
Ventura County
Watershed Protection District
Planning & Regulatory Division



**Benefit Assessment for
Flood Control
Fiscal Year 2010-2011
Figure 1**

II. BACKGROUND

II. BACKGROUND

The Ventura County Flood Control District was created September 12, 1944, when the California Legislature approved the Ventura County Flood Control Act. The District was formed, in part, to control and conserve flood and storm waters and to protect watercourses, watersheds, public highways, life and property from damage because of those waters. Over the years, the Flood Control Act has been amended to reflect the paradigm of the times, adding provisions for recreational use, scenic beauty, the enhancement, protection and preservation of the natural environment, and benefit assessment.

Once dominated by agriculture, Ventura County is now the 11th most populous county in California and home to more than 792,313 people. As land has been transformed into cities, it has become increasingly important to control floodwaters. Communities look to the District to protect their homes, businesses, and farmlands from devastating floods, while preserving water quality, safeguarding habitat and improving creek aesthetics.

On September 14, 2002, then Governor Gray Davis signed AB2320 (Strickland), changing the name of the District to the Ventura County Watershed Protection District, and the name of existing law to the Ventura County Watershed Protection District Act. The name change, effective January 1, 2003, represents the culmination of an evolution in the District's mission, community values, regulatory requirements and funding opportunities.

Authority to implement a BA Program is established by the Ventura County Watershed Protection District Act (Chapter 46 of the Water Code Appendix, as amended) and by California Government Code Section 54710. Other pertinent legal requirements are defined in California Government Code Sections 54711, 54715 and 54716.

On July 15, 1980, the District Board of Supervisors approved the Flood Control Benefit Assessment Ordinance (FC-26), that allows for the establishment and levy of benefit assessments to pay for the costs of providing flood control services in Zones 1, 2, 3 and 4. The Ventura County Watershed Protection District BA Program was subsequently established by the District Board of Supervisors on June 14, 1988, establishing the first assessment rates in each of the District's four zones for Fiscal Year 1988-89. In each subsequent year, the District Board of Supervisors has resolved to continue the District BA Program.

Originally established to finance the rising costs of operations and maintenance of District facilities in each zone, the BA Program has been expanded over the years to provide needed revenues for emergency flood damage repair costs from the flood disasters of 1995, 1998, and 2005, for instance, and also to establish a flood damage repair reserve, and to implement the National Pollutant Discharge Elimination System stormwater program.

As a primary component of the 1972 Federal Clean Water Act, Congress established the National Pollutant Discharge Elimination System (NPDES) permit program to control water pollution by regulating the discharge of pollutants to the surface waters of the

United States. The NPDES permit program initially regulated wastewater discharges of industrial process water and wastewater from sewage treatment plants. However, in 1987, the Clean Water Act was amended to include NPDES permit requirements for the discharge of stormwater from publicly owned municipal storm drains.

In response to those requirements, on August 22, 1994, the Los Angeles Regional Water Quality Control Board issued the Ventura County Watershed Protection District (as Principal Permittee), the County of Ventura, and the Cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley and Thousand Oaks (as Permittees) a five-year term countywide NPDES permit for discharges from publicly owned municipal storm drains in Ventura County. The first-term permit was educational in nature and emphasized agency staff training and outreach efforts to inform the public about storm water quality concerns. On July 27, 2000, a second five-year term countywide permit was issued to the Permittees. The second-term permit was more enforcement oriented and emphasized inspection related activities, compliance documentation, and monitoring.

On May 7, 2009 the Los Angeles Regional Water Quality Control Board adopted a new NPDES permit (Order Number 09-0057) (Permit) for the discharge of stormwater from Ventura County's municipal separate storm drain systems. The third-term Permit was effective on August 5, 2009. The LA Water Board Permit voluntarily remanded and reissued the Permit on July 8, 2010 as NPDES Permit No. CAS004002/Order No. 10-108 (Permit). This Permit became immediately effective upon adoption and is also considered the third term Permit.

The Permit designated the Watershed Protection District (District) as the Principal Permittee and as such the District has specific responsibilities including countywide program coordination, water quality monitoring, preparation and submittal of reports and public outreach.

The District, as Principal Permittee, has taken the lead in the development of an integrated Countywide Stormwater Quality Management Program. Since its inception, the Stormwater Quality Management Program has been financed through the District's BA Program. Implementation Agreements (dated June 30, 1992) between the District and the other Permittees (Cities and County of Ventura) provide for the structure that allows for the County and the Cities to utilize BA funds to finance NPDES related activities.

The additional program cost for the Principal Permittee as well as the Permittees associated with the 2010 NPDES Permit has prompted further effort among the Permittees to equitably share the increased costs. The result of that effort was the drafting of a new Implementation Agreement in 2010.

The Agreement defines the fiscal responsibilities (expenditures and contributions) of all collective parties with respect to the current Permit. It formalizes the Permittees' commitment to cooperate and to mutually fund an integrated Program of protecting and improving water quality in Ventura County. This Agreement allows for a sharing of Principal Permittee costs among all the Permittees, and replaces the original 1992 NPDES

Implementation Agreement for five years. At that time a new agreement will be adopted or the original 1992 NPDES Implementation Agreement will become effective again.

Assessments are levied based on the proportion of stormwater a parcel of land contributes to the overall stormwater runoff. This funding mechanism has allowed the Permittees to utilize a stable, flexible, and equitable program to pursue stormwater management goals and improve water quality countywide. Prior to the passing of Proposition 218 in 1998, NPDES BA rates were adjusted according to fund reserves and projects required by the permit. However, Proposition 218 prohibited rate increases without majority approval from property owners.

With the issuance of a third term NPDES Permit on July 7, 2010, there have been substantial increases to permit requirements. Some of the more significant additional requirements include inspection of industrial facilities, inspection of construction sites and far more expansive water quality monitoring. Other significantly affected programs include land development, illicit discharge and illicit connection investigation, storm drain mapping and water quality monitoring and reporting. Additionally, Total Maximum Daily Loads (TMDLs), strict levels of pollutants that can enter a waterbody without impairing that water's beneficial uses, will become enforceable under the Permit.

In addition to responding to reports of illicit discharges and connections, the Permit also requires field screening of storm drains for evidence of polluting activities. Analytical monitoring of urban areas is also increased with a major outfall in each Permittees' jurisdiction to be sampled. The result of that monitoring will be used to determine if the discharge is causing or contributing to water quality exceedances in the receiving water.

Significant new development and redevelopment projects are required to implement Low Impact Development (LID) concepts. The main tenet of LID is for developments to disconnect impervious surfaces (e.g., parking lots and rooftops) from the storm drain systems by providing for onsite infiltration and/or retention. The Permit sets a strict limit of allowing only 5% of a project area to drain off a site unless technical infeasibility can be demonstrated. Projects with technical infeasibility are allowed to use biofiltration, and certain types of projects with technical infeasibility are allowed offsite alternative compliance mitigation. All stormwater draining from new development and significant redevelopment will still need to be treated to remove pollutants, and new performance standards will be used to select the appropriate treatment.

The following are planned in 2011:

- Implementation of the revised Technical Guidance Manual for Stormwater Quality Control Measures. The Technical Guidance Manual is guide for future new development and redevelopment to comply with the low impact development Permit requirements. To facilitate the implementation special training for Permittee staff and the public is planned.
- Development of an offsite alternative compliance mitigation program with an integrated water resource management approach that also considers flood

protection surface water impairments, seawater intrusion, groundwater recharge, and potential water reuse through water banking.

- Implementation of the Youth Outreach Plan and a general public outreach campaign to change behaviors that contribute to stormwater pollution.
- Development of new monitoring procedures and the sampling of river sediment for pyrethroid pesticides, which is an emerging pollutant introduced to replace recently banned pesticides.
- Continuation of the Regional Bioassessment Program to assess the overall health of Southern California streams.
- Development of a new Electronic Annual Report format to show compliance with the Permit and Improve program effectiveness.

This report presents continuation of the BA Program to supplement insufficient existing revenues for financing the routine operation and maintenance of District facilities and the Ventura Countywide Stormwater Quality Management Program as required by federal NPDES regulations. Additionally, this report outlines the continuation of a benefit assessment component for flood damage repair reserve in Zones 1, 2, and 3 (see Figure 1).

**III. WATERSHED PROTECTION
NEEDS ASSESSMENT AND
AVAILABLE FUNDING**

III. WATERSHED PROTECTION NEEDS ASSESSMENT AND AVAILABLE FUNDING

A. DEVELOPMENT AND FLOOD HAZARD MITIGATION

Over the years, the District has developed and maintained an integrated system of flood mitigation facilities and floodplain management regulations designed to reduce flood damages. Policy makers, in planning community development, have relied upon the existence and effectiveness of this system. Residential, commercial, and industrial developments have been approved on the basis that the dams, detention basins, debris basins, channels, and stabilizing structures be constructed to District standards and maintained in a safe and effective condition. Federal flood insurance requirements are also based upon the effective performance of the system. Construction of the District facilities began in 1944 and has continued up to the present time.

The extreme and unpredictable seasonal range in rainfall that is characteristic of the south coastal region of California, combined with the geographic and geologic conditions, makes Ventura County extremely vulnerable to flooding, water erosion, and mud flow hazards during the winter storm season. Repeated flood disasters in 1969, 1978, 1980, 1983, 1992, 1995, 1998, and 2005 have demonstrated this potential. Sustained economic growth in the region increases the potential for catastrophic economic loss and even loss of life from these hazards. Purposeful measures are necessary to ensure that the chance for catastrophic loss in the local communities and rural areas is minimized.

Ventura County grew at a considerable rate from 1950 to 1980.⁴ During that time as county land use transitioned from farmland to urbanized areas, the District invested considerable funds to create a viable infrastructure of watershed protection facilities such as channels and basins to provide protection from stormwaters for the growing population. According to the Southern California Association of Governments (SCAG), Ventura County's population grew by 12.58% between the 1990 and the 2000 census, making it the fifth fastest growing county in California in terms of population growth--behind only Riverside, Imperial, San Bernardino and Orange counties for that time period.⁵

Figures now show that the growth trend for Ventura County is slowing. Agricultural preservation laws limited some development in the county and citizens have enacted a number of growth controls to preserve farmland and open space. Some growth is still expected in Ventura County, but growth will be the second slowest, higher only than Orange County, as the region looks toward 2025.⁵ Because growth is slowing in the Ventura County region, it is to be expected that historically increasing amounts collected for Benefit Assessment will also level off somewhat. Nevertheless, costs to maintain the older components of the watershed infrastructure, in particular, will increase. Overall costs to maintain the countywide system in general will also increase, taxing already limited revenues.

4. <http://www.scag.ca.gov/resources/pdfs/Counties/VenturaCounty.pdf>

5. <http://www.scag.ca.gov/census/>

B. ROUTINE OPERATIONS AND MAINTENANCE

The District owns and operates significant physical watershed protection infrastructure (channels, dams, levees, basins, etc.). These facilities are generally summarized by zone in Table 1 (watershed zone boundaries are shown in Figure 1).

For several years the cost of routine operations and maintenance in each zone has exceeded the benefit assessment collected for that purpose. Additional needed funding has come from property tax revenue, normally used for capital projects and advance planning.

C. FLOOD DAMAGE REPAIR RESERVE

Due to the unpredictable nature of the winter weather in Ventura County and frequently experienced flood damage, periodic increases in assessments have been necessary to cover the cost of damage repair. Between 1988 and 1995, three temporary assessment increases were levied to cover shortfalls in O&M funding and State and Federal reimbursements.

In June 1995, a Flood Damage Repair Reserve was established through the BA as a precautionary measure to fund future emergency repairs. The intent was to offset future flood damage repair costs while minimizing the fluctuations in BA rates. The establishment of this fund later proved to be extremely prudent because Article XIII C and XIII D of the State Constitution (formerly Proposition 218) contained no provision for dealing with emergency circumstances. The amount collected for Flood Damage Repair Reserve typically amounts to about \$1 million annually via the BA. This amount varies slightly depending on the values of land use parameters existing at the time the BA is calculated.

When disaster strikes, the District mobilizes in response to ensure continued operation of facilities and to mitigate potential future damage because of the disaster. Continued augmentation of this Reserve component ensures that the District has funds available to repair damaged facilities and to implement mitigation measures in a timely manner. A Presidential disaster declaration authorizes federal funds to provide disaster and mitigation assistance under several State and Federal programs. While these programs often reimburse a considerable amount of costs associated with the disaster, the District remains responsible for the required local match share and for any ineligible project costs. Flood Damage Repair Reserve funds have been used since Fiscal Year 1999 to cover any costs for the restoration of facilities damaged in the 1998 and 2005 storms not covered by State or Federal funding or by the Emergency Flood Damage Repair component of the BA Program.

The Flood Damage Repair Reserves were depleted completely after the 2005 flood disaster and it may be several more years before the difference between the District's expenditures and FEMA/OES reimbursements will be recovered through the Benefit Assessment.

D. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER REGULATION

This portion of the District BA Program provides needed revenues for the implementation of the Countywide NPDES Stormwater program. Assessments are levied based on the proportion of stormwater a parcel of land contributes to the overall stormwater runoff. Urbanization and other man-made alterations to the natural environment can significantly increase stormwater runoff, thereby increasing downstream flows into storm drains operated by the County, the District, and the Cities in the County. Summaries of these BA rates and an estimate of the needed revenue are presented in Tables 3 through 6.

NPDES is a federally mandated program established by the United States Congress with 1972 amendments to the Federal Water Pollution Control Act (known as the Clean Water Act or CWA). The CWA provides a statutory basis for the control of pollutants to the waters of the United States by requiring dischargers, including municipalities to obtain a NPDES permit which identifies and implements structural and non-structural Best Management Practices (BMPs).

The powers granted to the District include carrying on technical and other investigations, examinations and tests of all kinds, making measurements, collecting data and performing analyses, studies and inspections pertaining to water supply, control of floods, source identification, regulation and prevention of contamination and pollutants of surface waters within the District. The District owns, operates, and has regulatory jurisdiction over improved and natural channels to which the ten cities' and the County's storm drains are tributary. On March 31, 1992, the District's Board approved the concept of a cooperative agreement for a Municipal Stormwater Discharge Permit for the Calleguas Creek Watershed. Similar approvals soon followed for the remaining watersheds within the County.

On April 14, 1992, it was decided by Board resolution that the District's BA program would be the primary mechanism to finance a countywide stormwater program to meet federal NPDES requirements for the various municipalities within the District. The District would act as the Principal Co-permittee. City-by-city all ten incorporated jurisdictions joined into the program, although at present not all are financing their programs through the District's BA.

On May 7, 2009, the District, County of Ventura, and the ten Cities of Ventura County (Co-permittees) were issued their third NPDES permit for publicly owned municipal storm drain systems in Ventura County and within their jurisdiction. This permit established a series of requirements to be completed over the next five years. Although the Co-permittees' cooperative approach to countywide implementation of permit requirements continues to result in substantial savings to the residents of Ventura County, the NPDES program's costs continue to exceed Co-permittees' funding.

The County of Ventura and the Cities in the County (Co-permittees) also own and operate stormwater facilities subject to the countywide NPDES program. As in previous years most of the cities have requested that the District collect an assessment through the

BA Program to finance portions of their NPDES programs. The County of Ventura collects an assessment for these purposes in the Ventura River/Ojai Valley (District Zone 1) and the Santa Clara River Valley/Oxnard (District Zone 2) areas for FY2011. Due to voter approval of “Proposition 218”, any new or increased benefit assessments of the Calleguas Creek watershed (District Zone 3) and Hidden Valley/Lake Sherwood/Oak Park (District Zone 4) areas is prohibited. Therefore, the County as a Co-permittee representing the unincorporated area will not receive assessments to fund its NPDES programs for the unincorporated area within the District’s Zones 3 and 4 for the current fiscal year. Also, despite increasing program costs, the County, as Co-permittee, is prohibited from increasing assessment rates established in 1997 in Zones 1 and 2 due to Proposition 218’s restriction to rate increases.

Tables 3 through 6, show revenue slated to offset a major portion of the countywide NPDES program for FY2011. These funds are collected to perform permit compliance activities, including the District-wide share of approximately \$1.44 million. In addition, the Co-permittees (with the exception of the City of Moorpark and the County of Ventura) collectively receive \$1.66 million to help fund the costs of implementing various permit-required activities within their jurisdictions.

The countywide program for FY2011 includes the following elements:

1. Countywide NPDES Program Administration

The Ventura Countywide Stormwater Quality Management Program works cooperatively to ensure compliance with the countywide Stormwater Permit through the development and implementation of an integrated, effective and fiscally responsible stormwater quality management program with the objective of protecting and improving water quality in Ventura County.

The District manages the administration, financial accounting and preparation of all annual reports, internal audits and other documents for submittal to the Regional Water Quality Control Board, Los Angeles (RWQCB) as required by the Permit.

2. General Public Outreach and Education

The District administrates a Public Outreach Program on behalf of the Countywide Stormwater Program. Through the “Communities for a Clean Watershed” campaign, the Program, assisted by a consultant, prepares materials such as TV, radio print and web advertisements, and educational brochures to educate the public on water quality issues and the role of stormwater runoff to the health of receiving water bodies.

The Public Outreach Program is designed to implement and evaluate a comprehensive short- and long-term public education campaign that will inform the community about how our actions may adversely impact urban stormwater discharges and, subsequently, the local water bodies. Public Education is an essential and required part of a municipal stormwater program because changing public behavior can create a real reduction in pollutants. When a community has a clear understanding of where the pollution comes

from, how it can affect them and what they can do to stop it, they will be more likely to change their own practices and help educate others.

3. Municipal Staff Training

Training is important for the implementation of the Stormwater Program. An effective training program is one of the best pollution prevention BMPs that can be implemented because it prompts behavioral changes that are fundamentally necessary to protect water quality. Each Permittee targets staff based on the type of stormwater quality and pollution issues they typically encounter during the performance of their regular activities. This includes staff directly involved preventing pollution, such as inspectors and field crews, and those indirectly involved such as planners and development engineers.

4. Illicit Discharge Program

Illicit connections and illicit discharges (IC/ID) can be concentrated sources of pollutants to municipal storm drain systems. To reduce this source of pollutants the Permittees have developed and implemented programs for the identification and elimination of ID/IC. Key components of these programs are public reporting, field screening, incidence response, education, and enforcement actions.

5. Clean Business Program

The daily activities of many businesses create a potential for pollutants to enter a storm drain system. The Permittees are addressing this source of pollutants through inspections of targeted businesses through educational outreach and enforcement if needed. These efforts include providing information on the potential for illicit discharges and illegal connections from businesses, aid in the selection and use of proper BMPs, and formal enforcement action and fines if environmental rules are ignored.

Permittees target restaurants, automotive repair facilities, industries subject to the state Industrial General Stormwater permit and mobile service businesses (surface cleaning, car washing, carpet cleaning, pool maintenance, etc.) for educational outreach on stormwater and illicit discharges.

6. Stormwater Ordinances

Permittees are reviewing their local ordinances to be in compliance with the third term Permit and are enforcing the current ordinances to protect water quality.

7. Public Agency Activities Program

The Permittees own and operate public facilities, and build and maintain much of the infrastructure of the urban and suburban environment throughout their jurisdictions. Some programs help remove pollutants before they reach receiving waters and others focus on source control ensuring activities performed do not contribute to stormwater pollution to the maximum extent practicable. Therefore public agencies have a dual role in removing pollutants before they are transported by the storm drain system and

preventing pollution from being generated in the operation and maintenance of these facilities.

8. Planning and Land Development Program

The addition of impervious areas for homes, industrial and commercial businesses, parking lots, and streets and roads increases the amount of stormwater runoff, as well as the potential for pollution. The Planning and Land Development Program ensures that the impacts on stormwater quality from new development and redevelopment are limited through implementation of general site design measures, site-specific source control measures, low impact development strategies and treatment control measures. The general strategy for development is to avoid, minimize, and mitigate (in that order) the potential adverse impacts to stormwater. The potential for long-term stormwater impacts from development is also reduced by requiring ongoing operation and maintenance of post-construction treatment controls.

9. Construction Site Program

During construction projects a number of activities may generate or mobilize pollutants. Using inspection, education and enforcement the Development Construction Program coordinates resources to effectively reduce pollutants in runoff from private construction sites during all construction phases

10. Stormwater Quality Monitoring

The District, on behalf of all the Permittees, conducts monitoring of water chemistry, toxicity and biologic function of creeks, rivers and channels throughout Ventura County. Three Mass Emission stations and eleven Major Outfall stations are monitored in both wet and dry weather. Mass Emission stations are located in the lower reaches of the three major watersheds in Ventura County (Ventura River, Santa Clara River, and Calleguas Creek). Major Outfall stations, a new component of the Stormwater Monitoring Program, are located in catchments representative of each Permittee's contribution to downstream waters. Results of the sampling are analyzed to produce pollutant load estimates, identify pollutants of concern, evaluate receiving water quality impacts, and to produce an annual water quality summary report.

The District also participates in several special studies as required by the Permit including a Southern California Regional Bioassessment Study to determine the overall health of local streams, and a Pyrethroid Pesticide study to identify impacts of new products.

E. SUPPORT SERVICES

The construction, operation, and maintenance of Watershed Protection facilities require a variety of related support services, discussed below:

1. Project Design and Inspection - Most District capital projects are designed and inspected by District personnel, with construction performed under private contracts.
2. Watershed Protection Planning and Hydrology - District engineers, as well as numerous outside engineers and agencies, use hydrologic calculations of peak flood flows in the design of Watershed Protection facilities. The District also maintains sophisticated flood warning systems in critical flood hazard areas such as Sespe Creek, Calleguas Creek, and Ventura River that are utilized extensively during flood operations in the winter months and fire condition in the summertime.
3. Geographic Information System (GIS) - Ventura County Watershed Protection District staff are defining and creating GIS coverage for District rights-of-way, permits, facilities, flood plain maps, etc. with the goal of providing engineers and the general public useful information in a timely manner.
4. Benefit Assessment Implementation - The law permits the use of BA revenues to fund the cost of calculating assessments and preparing the roll.
5. General Administration - This includes the normal management, clerical, and accounting functions associated with District operations and maintenance and construction.

F. REVENUE SOURCES

Present major sources of revenue are discussed below:

1. **Property Taxes** - It is assumed that the District will continue to receive a portion of the property taxes collected on the basis of 1% of the assessed value as prescribed in Article XIII A of the State Constitution. State's Budget crisis impact (if any) is unknown at this time.
2. **Land Development Fees for Watershed Protection** - The District has collected land development fees for the design and construction of Watershed Protection projects since 1967 in Zone 3, and 1979 in all other zones. Fees are presently \$2400/acre or \$600/single family dwelling. Under the Flood Control (Watershed Protection) Act, as amended, these figures may fluctuate slightly based on current costs of construction; however the District does not have authority to collect more than \$2,400/acre or \$600/single family dwelling for Land Development Fees. The capital improvement program, including design and inspection, is financed by District property tax revenues and by land development fees.

Fiscal Year 2009-2010, spanning July 1, 2009 through June 30, 2010, resulted in \$181,870 for District-wide land development fees. The District has so far collected \$71,331 for the first seven months of FY 2010 - 2011 as property is being developed. As a comparison, the District-wide land development revenue for FY2010 - 2011 has so far averaged \$10,190 per month over a seven month period and revenue for FY2007-2008, averaged \$72,539 per month. It is clear that the

downward trend seen in recent years will continue, leaving the District with less funding from this source now and into the future.

G. REVENUE DEFICIT

The economic squeeze generated by cost inflation and the tax reduction of Proposition 13, together with the property tax shift from special districts to schools in previous years, require that the District drastically cut back on capital project construction. The District-wide capital project budget in FY1978, for instance, was approximately \$8.6 million, and in FY1988 (before the first BA Program) the budget for District capital projects was less than \$5.4 million. The financial reality concerning District funding is that a shortfall exists between costs and revenues- a shortfall that will likely expand in the future.

**IV. DISCUSSION OF
EXISTING BENEFIT
ASSESSMENT PROGRAM**

IV. DISCUSSION OF EXISTING BENEFIT ASSESSMENT PROGRAM

A. PROPORTIONATE STORM WATER RUNOFF

The purpose of the existing BA program is to provide needed revenues for the District to manage stormwater. The concept of levying assessment based on storm water runoff was particularly pertinent where District services are involved. Most all manmade uses increase storm runoff over that which would otherwise occur naturally and, consequently, increases downstream flood hazards.

Some human uses of the land increase stormwater runoff at a greater rate than others. Stormwater runoff from a shopping center with a high percentage of roofs and parking lots will be greater than runoff from a golf course of equal size with large amounts of grassy areas and landscaping. This proportional difference in runoff was the basis for computing existing BA fees.

B. THE BASIC ASSESSMENT UNIT

In order to establish the "proportionate" storm water runoff on any one parcel of land in relation to total runoff, it was necessary to establish a benchmark to relate that one parcel to all others. This benchmark is called the Basic Assessment Unit (BAU).

The existing BA program for Watershed Protection uses a single family dwelling (sfd) on 0.2 acres of land with an imperviousness factor of 0.40 (40%) as the Basic Assessment Unit (see Figure 2). A single-family dwelling represents a reasonable middle-ground of all potential land uses, as well as the most numerous type of use. The basic assessment unit may be expressed numerically as follows:

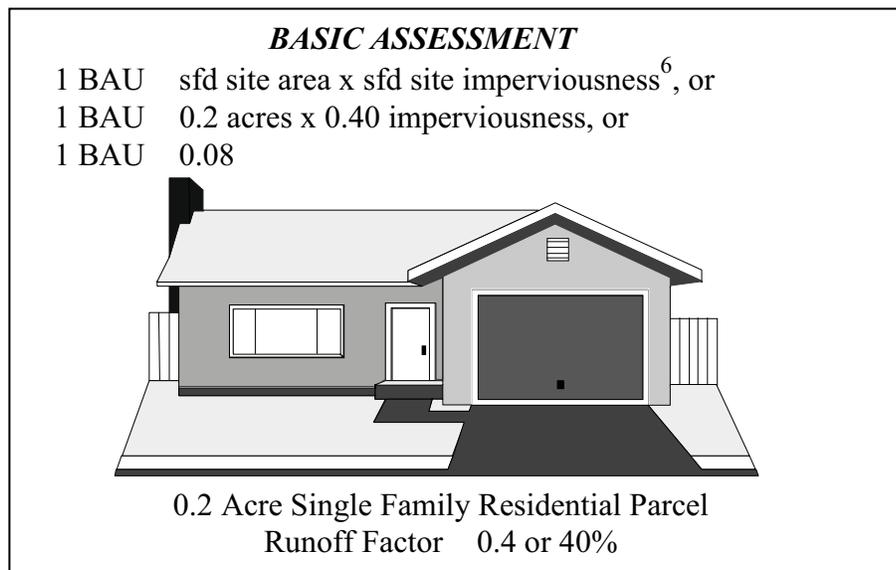


FIGURE 2: All parcels may be equated to the number of BAUs they contain.

6. This is determined by multiplying one acre by the site imperviousness and dividing by one basic assessment unit.

Example:

1 acre of commercial	$\frac{1 \text{ acre} \times 0.88 \text{ imperviousness}}{1 \text{ BAU (0.08)}}$	$\frac{0.88}{0.08}$	11 BAU per acre
----------------------	--	---------------------	-----------------

C. LAND USE AND AREA

The basic factors needed to relate any one parcel of land to the BAU are site use and area. The best available source of this information is the County Assessor's Office. The County Assessor's master property file is a computerized source of both the use and the area of each parcel of land in the County. The file gives each parcel a four-digit site use code. Each of the site use codes used in the program have been analyzed and assigned an imperviousness factor as well as an assessment formula as discussed below (also see Appendix "A"). The District has made minor modifications to the site use codes on the Assessor's Master property file in order to more accurately reflect the level of imperviousness of each use.

D. ASSESSMENT FORMULAS

Where the assessor site use code describes the entire use to be expected on a parcel, the number of BAUs for that parcel is calculated as follows:

$$\begin{array}{l} \text{Number of Basic} \\ \text{Assessment Units} \\ \text{or } (AA \times SI) / 0.08 \end{array} \quad \frac{\text{Parcel area (AA) x site imperviousness (SI)}}{1 \text{ Basic Assessment Unit (0.08)}}$$

A more convenient expression of the basic formula is shown here⁵:

$$(\text{BAUs per acre}) \times (\text{Parcel Area})$$

Actual assessments are calculated by multiplying BAUs by the rate per BAU established for each zone:

$$\begin{array}{l} \text{Assessment} \\ \text{for parcel} \end{array} \quad \begin{array}{l} \text{Total BAUs} \\ \text{for applicable zone} \end{array} \quad \times \quad \begin{array}{l} \text{Existing Assessment rate per BAU} \end{array}$$

1. Single-Use Formulas:



Seven of the formulas used in the program were created using the above format⁶. Each is shown below with the general land use categories to which they apply and the imperviousness factor for each.

A - Condominiums

$$\begin{array}{l} \text{BAUs} \\ (0.72 \text{ impervious}) \end{array} \quad 9 \text{ BAUs / Acre} \times \text{AA (Parcel area in acres)}$$

B - Rest Homes, Churches, Schools

$$\begin{array}{l} \text{BAUs} \\ (0.6 \text{ impervious}) \end{array} \quad 7.5 \text{ BAUs / Acre} \times \text{AA}$$

C - Residential

BAUs 5 BAUs / Acre x AA
(0.4 impervious)

D - Commercial/Industrial

BAUs 11 BAUs / Acre x AA
(0.88 imperviousness)

E - Golf Courses, Greenbelts

BAUs 2.5 BAUs / Acre x AA
(0.2 imperviousness)

F - Vacant Land, Mining, Oil Wells

BAUs 0.125 BAU / Acre x AA
(0.01 imperviousness)

G - Agriculture

a. BAUs 0.2375 BAU / Acre x AA
(0.019 imperviousness)

b. Examples of Calculating Basic Assessment Units using
Single Use Formula

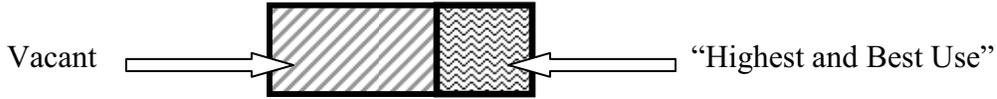
- A 5.0 acre multi-tenant neighborhood shopping center
(site use code 5030)
From Appendix A: 0.88 imperviousness, Formula D.

BAUs 11 BAUs /Acre x 5.0 acres
55 BAUs

- An 80 acre orchard (site use code 8030)
From Appendix A - 0.019 imperviousness - Formula G.

BAUs 0.2375 BAU / Acre x 80 acres
19.0 BAUs

2. Mixed-Use Formulas:



a. Formulas Involving Residential Mixed Uses

Where a site use code was found to describe only a portion of the actual parcel it was necessary to develop a "mixed" assessment formula. The "other" use not described by the site use code is considered to be vacant land⁷. The mixed-use formulas are as follows:

$$\text{Number of Units} \quad \text{BAUs representing Highest and Best Use} \quad + \quad \left(\left[\text{Parcel Area} - \text{Area of Highest \& Best Use} \right] \times \text{BAUs per acre of remaining vacant portion of parcel} \right)$$

In the case of mixed-use parcels with site use codes describing single family dwellings (up to 4 dwellings on one lot) it is appropriate to assign one basic assessment unit to each dwelling and assume any remaining portion is vacant land. Four formulas were developed to accommodate these types of site use codes:

H - 1 Dwelling Unit

$$\text{BAUs} \quad 1 \text{ BAU} + [(\text{AA}-0.2 \text{ acres}) \times 0.125 \text{ BAU/acre}]$$

I - 2 Dwelling Units

$$\text{BAUs} \quad 2 \text{ BAU} + [(\text{AA}-0.4 \text{ acres}) \times 0.125 \text{ BAU/acre}]$$

J - 3 Dwelling Units

$$\text{BAUs} \quad 3 \text{ BAU} + [(\text{AA}-0.6 \text{ acres}) \times 0.125 \text{ BAU/acre}]$$

K - 4 Dwelling Units

$$\text{BAUs} \quad 4 \text{ BAU} + [(\text{AA}-0.8 \text{ acres}) \times 0.125 \text{ BAU/acre}]$$

7. "Mixed-use" formulas may apply depending on a particular parcel's size. See D-2, Mixed Use Formulas on following page and Appendix "A".

Where the actual parcel size is less than that of the assumed number of basic assessment units then the Group "C" formula is used

b. Examples of Calculating Basic Assessment Units using Residential Mixed Use Formulas

- Two single family dwellings on a 10 acre lot (site use code 1222)
From Appendix A: 0.40 imperviousness, Formulas C&I

Formula "I"

$$\begin{aligned} \text{BAUs} &= 2 \text{ BAUs} + [(10 \text{ acres} - 0.4 \text{ acre}) \times 0.125 \text{ BAU} / \text{Acre}] \\ &= 2 \text{ BAUs} + 1.2 \text{ BAU} \\ &= 3.2 \text{ BAUs} \end{aligned}$$

- A four family dwelling (quadplex) on a 0.6 acre lot
(site use code 1410)
From Appendix A: 0.40 imperviousness, Formulas C&K

Formula "C"

$$\begin{aligned} \text{BAUs} &= 5 \text{ BAUs} / \text{Acres} \times 0.6 \text{ acres} \\ &= 3 \text{ BAUs} \end{aligned}$$

c. Formulas Involving Urban Mixed Uses

In researching site use codes and actual land uses, it was found that "mixed" uses also existed in types of land use other than residential. These additional "mixed" formulas were created to accommodate the unique circumstances of certain types of use:

L - Churches, Private Schools, Colleges, Rest Homes and Camps with areas over 2 acres
(0.6 imperviousness)
$$\text{BAUs} = 15 \text{ BAUs} + [(AA - 2.0 \text{ acres}) \times 0.125 \text{ BAU} / \text{Acre}]$$

M - Golf Courses, Green Belts
(0.2 imperviousness)
$$\text{BAUs} = 30 \text{ BAUs} + [(AA - 12.0 \text{ acres}) \times 0.125 \text{ BAU} / \text{Acre}]$$

N - Mobile Home Park
(0.72 imperviousness)
$$\text{BAUs} = 90 \text{ BAUs} + [(AA - 10.0 \text{ acres}) \times 0.125 \text{ BAU} / \text{Acre}]$$

O - Industrial, Resource Production, Greenhouses, Egg Production
(0.88 imperviousness)
$$\text{BAUs} = 110 \text{ BAUs} + [(AA - 10.0 \text{ acres}) \times 0.125 \text{ BAU} / \text{Acre}]$$

d. Examples of Calculating Basic Assessment Units using Urban Mixed Uses

- A church on a 3.5 acre parcel
(site use code 6900)
From Appendix A: 0.6 imperviousness, Formulas B&L

Formula "L"

$$\begin{aligned} \text{BAUs} &= 15 \text{ BAUs} + [(3.5-2.0) \times 0.125 \text{ BAU / Acre}] \\ &= 15 \text{ BAUs} + 0.19 \text{ BAUs} \\ &= 15.19 \text{ BAUs} \end{aligned}$$

- A manufacturing plant on a 20 acre parcel
(site use code 2020)
From Appendix A: 0.88 imperviousness, Formulas D&O

Formula "O"

$$\begin{aligned} \text{BAUs} &= 110 \text{ BAUs} + [(20-10.0) \times 0.125 \text{ BAU / Acre}] \\ &= 110 \text{ BAUs} + 1.25 \text{ BAU} \\ &= 111.25 \text{ BAUs} \end{aligned}$$

E. ASSESSMENT FEES FOR FY2010

The assessment formulas above were intended to provide the most equitable distribution of assessments possible. Assessment rates for routine maintenance and damage repair are shown in Table 2 and for NPDES in Tables 3 through 6. The total assessment for any property is the summation of the rate for the applicable zone in Table 2 and for the applicable rate in Tables 3 through 6. For example, the overall recommended assessment rate of \$36.99 for the City of Ventura in Zone 2 is a combination of the following:

(Roll 14-05)	District Operations and Maintenance -	\$27.13
(Roll 14-30)	District NPDES Compliance in the City of Ventura -	\$3.96
(Roll 14-46)	City of Ventura NPDES Compliance -	\$5.90
	Total:	\$36.99

Table 9 provides a comparison of the total assessment rates assessed for FY2011 with those for FY2010. Table 8 defines assessments for typical land uses in each zone.

F. CALIFORNIA ENVIRONMENTAL QUALITY ACT

The provisions of the California Environmental Quality Act (CEQA), requiring the determination of environmental impacts of projects, do not apply to the establishment of a benefit assessment program according to Section 21080(b) (8) of the Public Resources Code. The purpose of the FY2011 District BA is to meet capital costs and operation and maintenance expenses required to maintain service within existing service areas.

G. APPEAL PROCESS

Assessments may be appealed according to provisions defined by the Board of Supervisors of the Ventura County Watershed Protection District. Generally, these

provisions provide that an assessment may be revised by the Director of the Ventura County Public Works Agency where it can be found that errors have been made in the assessment computation based only on one or more of the following:

1. Changes or corrections in ownership of a parcel
2. Subdivision of an existing parcel into 2, 3, or 4 parcels
3. Use of a parcel
4. Area of a parcel
5. Mathematical computations

Any person who does not agree with the determination of the Director regarding adjustments in assessment calculations may, within 30 days after the date of such refusal, appeal that determination to the Board of Supervisors. The appeal shall be in the form of a written notice and shall be signed by the party aggrieved. The notice shall contain the assessor parcel number(s), the amount of assessment, and the reason for the appeal. At the hearing, the appellant shall have the burden of establishing, to the satisfaction of the Board, that he or she is entitled to a revised assessment; otherwise, the decision of the Director shall stand. The decision of the Board is final.

H. AVAILABILITY OF REPORT AND ASSESSMENT ROLL

This report is available for review at the following location:

Ventura County Watershed Protection District
County of Ventura Government Center
Hall of Administration
800 South Victoria Avenue
Ventura, CA 93009
Telephone: (805) 650-4060 / (805) 650-4073

Appendices B and C are separate volumes included in this final report and are available for review at the offices of Ventura County Watershed Protection District. Inquiries concerning the BA Program, fee calculations, or the appeal process for assessment should be directed to the Benefit Assessment office of the District at the address listed above.

I. DISCUSSION OF NOTICE AND MEETING/HEARING PROCESS

On January 1, 1994, SB 376 became effective establishing new noticing and hearing requirements for local taxes and assessments. This legislation requires that public notice be given for any new or increased taxes or assessments. SB 1977, effective January 1, 1993, requires that an additional public hearing to be held on a date different from the enactment hearing to allow public testimony if there are to be increased amounts. Although rates were held to the same rate as previous years two meetings were held for FY 2011. The first meeting was held on May 11, 2010 as “receive and file” item to The Board of Supervisors to allow for public review of the proposed rates for FY2011. The second meeting was held on June 8, 2010 to allow for public testimony and to put proposed rates up to vote of the Board. The Board of Supervisors of the Watershed Protection District published notice for the public hearing / enactment meeting as an agenda item, time certain. The rates were approved by resolution at the public hearing on June 8, 2010.

V. TABLES

TABLE 1
FACILITIES MAINTAINED BY THE
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

MAINTAINED FACILITIES	ZONE 1	ZONE 2	ZONE 3	ZONE 4	TOTAL
CHANNEL MILES (Improved & Unimproved)	18	"#	108	3	209
PUMPING PLANTS	#	4	#	#	4
DEBRIS & DETENTION BASINS	6	11	2)	1	44

TABLE
2010/2011
ASSESSMENTS FOR ROUTINE MAINTENANCE
IN ZONE 1

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF OJAI ASSESSMENT FACTOR	AMOUNT
ACRE	1,802
%PARCELS	2,884
BASIC ASSESSMENT %	4.3%
ASSESSMENT OF (ANNUAL MAINTENANCE	\$83,120
FLOOD DAMAGE REPAIR (RESERVE FUND	\$17,500
O & M ASSESSMENT	\$101,100
O & M ASSESSMENT (RATE/ AU	.11
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SAN BUENAVENTURA ASSESSMENT FACTOR	AMOUNT
ACRE	1,738
%PARCELS	4,691
BASIC ASSESSMENT %	\$2.25
ASSESSMENT OF (ANNUAL MAINTENANCE	\$184,266
FLOOD DAMAGE REPAIR (RESERVE FUND	\$40,391
O & M ASSESSMENT	.10%
O & M ASSESSMENT (RATE/ AU	.10%
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP ASSESSMENT FACTOR	AMOUNT
ACRE	22,481
%PARCELS	184
BASIC ASSESSMENT %	14.1%
ASSESSMENT OF (ANNUAL MAINTENANCE	\$241,671
FLOOD DAMAGE REPAIR (RESERVE FUND	-\$825
O & M ASSESSMENT	.10%
O & M ASSESSMENT (RATE/ AU	.10%
TOTALS FOR ZONE 1	AMOUNT
ACRE	26,248
%PARCELS	18,484
BASIC ASSESSMENT %	2.5%
ASSESSMENT OF (ANNUAL MAINTENANCE	-\$825
FLOOD DAMAGE REPAIR (RESERVE FUND	\$119,196
TOTAL O & M ASSESSMENT	.10%

TABLE 2
&'()*+),-./
2010/2011 ASSESSMENTS FOR ROUTINE MAINTENANCE
IN ZONE 2

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF CAMARILLO ASSESSMENT FACTOR	AMOUNT
ACRES	29
PARCELS	13
BASIC ASSESSMENT UNITS	224
ASSESSMENT FOR ROUTINE MAINTENANCE	\$5,330
FLOOD DAMAGE REPAIR RESERVE FUND	\$733
O & M ASSESSMENT	\$27,130
O & M ASSESSMENT RATE/BAU	\$27.13
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF FILLMORE ASSESSMENT FACTOR	AMOUNT
ACRES	1,142
PARCELS	3,839
BASIC ASSESSMENT UNITS	4,275
ASSESSMENT FOR ROUTINE MAINTENANCE	\$105,165
FLOOD DAMAGE REPAIR RESERVE FUND	\$14,022
O & M ASSESSMENT	\$119,180
O & M ASSESSMENT RATE/BAU	\$27.88
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF OXNARD ASSESSMENT FACTOR	AMOUNT
ACRES	9,255
PARCELS	39,125
BASIC ASSESSMENT UNITS	56,732
ASSESSMENT FOR ROUTINE MAINTENANCE	\$1,395,556
FLOOD DAMAGE REPAIR RESERVE FUND	\$186,074
O & M ASSESSMENT	\$1,581,631
O & M ASSESSMENT RATE/BAU	\$27.88
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF PORT HUENEME ASSESSMENT FACTOR	AMOUNT
ACRES	6,312
PARCELS	6,312
BASIC ASSESSMENT UNITS	4,921
ASSESSMENT FOR ROUTINE MAINTENANCE	\$120,608
FLOOD DAMAGE REPAIR RESERVE FUND	\$16,134
O & M ASSESSMENT	\$136,742
O & M ASSESSMENT RATE/BAU	\$27.88

Note: Parcel count is for non-exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 2
&'()*+),-./
2010/2011 ASSESSMENTS FOR ROUTINE MAINTENANCE
IN ZONE 2

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SANTA PAULA ASSESSMENT FACTOR	AMOUNT
ACRES	1,826
PARCELS	6,744
BASIC ASSESSMENT UNITS	9,120
ASSESSMENT FOR ROUTINE MAINTENANCE	\$217,482
FLOOD DAMAGE REPAIR RESERVE FUND	\$29,909
O & M ASSESSMENT	\$247,391
O & M ASSESSMENT RATE/BAU	\$27.13
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SAN BUENAVENTURA ASSESSMENT FACTOR	AMOUNT
ACRES	5,424
PARCELS	23,994
BASIC ASSESSMENT UNITS	32,597
ASSESSMENT FOR ROUTINE MAINTENANCE	\$777,301
FLOOD DAMAGE REPAIR RESERVE FUND	\$106,899
O & M ASSESSMENT	,\$\$!°~
O & M ASSESSMENT RATE/BAU	\$27.13
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	81,618
PARCELS	\$*##,
BASIC ASSESSMENT UNITS	27,581
ASSESSMENT FOR ROUTINE MAINTENANCE	\$657,783
FLOOD DAMAGE REPAIR RESERVE FUND	\$90,462
O & M ASSESSMENT	,0!\$°! !
O & M ASSESSMENT RATE/BAU	\$27.13
TOTALS FOR ZONE 2	AMOUNT
ACRES	\$\$*\$,#
PARCELS	89,032
BASIC ASSESSMENT UNITS	135,451
ASSESSMENT FOR ROUTINE MAINTENANCE	\$3,279,227
FLOOD DAMAGE REPAIR RESERVE FUND	!!!°~ !
TOTAL O & M ASSESSMENT	~°~°!#°%

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 2
&'()*+),-./
2010/2011 ASSESSMENTS FOR ROUTINE MAINTENANCE
IN ZONE 3

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF CAMARILLO ASSESSMENT FACTOR	AMOUNT
ACRES	7,525
PARCELS	22,318
BASIC ASSESSMENT UNITS	30,689
ASSESSMENT FOR ROUTINE MAINTENANCE	\$761,292
FLOOD DAMAGE REPAIR RESERVE FUND	\$61,370
O & M ASSESSMENT	\$~o~m~m~
O & M ASSESSMENT RATE/BAU	\$26.81
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF MOORPARK ASSESSMENT FACTOR	AMOUNT
ACRES	3,932
PARCELS	10,394
BASIC ASSESSMENT UNITS	13,023
ASSESSMENT FOR ROUTINE MAINTENANCE	\$297,928
FLOOD DAMAGE REPAIR RESERVE FUND	\$26,043
O & M ASSESSMENT	\$323,971
O & M ASSESSMENT RATE/BAU	.! \$\$
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SIMI VALLEY ASSESSMENT FACTOR	AMOUNT
ACRES	12,849
PARCELS	37,339
BASIC ASSESSMENT UNITS	47,894
ASSESSMENT FOR ROUTINE MAINTENANCE	\$1,139,669
FLOOD DAMAGE REPAIR RESERVE FUND	-\$,*++#
O & M ASSESSMENT	\$1,235,439
O & M ASSESSMENT RATE/BAU	.# \$~
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF THOUSAND OAKS ASSESSMENT FACTOR	AMOUNT
ACRES	11,552
PARCELS	35,518
BASIC ASSESSMENT UNITS	49,802
ASSESSMENT FOR ROUTINE MAINTENANCE	\$1,188,609
FLOOD DAMAGE REPAIR RESERVE FUND	-\$\$*,\$#
O & M ASSESSMENT	\$1,288,199
O & M ASSESSMENT RATE/BAU	.# \$0

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 2
&'()*+),-./
2010/2011 ASSESSMENTS FOR ROUTINE MAINTENANCE
IN ZONE 3

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	64,108
PARCELS	10,225
BASIC ASSESSMENT UNITS	22,579
ASSESSMENT FOR ROUTINE MAINTENANCE	\$560,145
FLOOD DAMAGE REPAIR RESERVE FUND	\$45,155
O & M ASSESSMENT	, ""#°%%
O & M ASSESSMENT RATE/BAU	\$26.81
TOTALS FOR ZONE 3	AMOUNT
ACRES	\$\$*\$))
PARCELS	115,794
BASIC ASSESSMENT UNITS	163,987
ASSESSMENT FOR ROUTINE MAINTENANCE	\$3,947,643
FLOOD DAMAGE REPAIR RESERVE FUND	\$327,928
TOTAL O & M ASSESSMENT	,!°0#°#""%

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 2
&'()*+,.-/
2010/2011 ASSESSMENTS FOR ROUTINE MAINTENANCE
IN ZONE 4

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF THOUSAND OAKS ASSESSMENT FACTOR	AMOUNT
ACRES	2,523
PARCELS	5,510
BASIC ASSESSMENT UNITS	8,562
ASSESSMENT FOR ROUTINE MAINTENANCE	\$57,017
O & M ASSESSMENT	\$57,017
O & M ASSESSMENT RATE/BAU	" ""
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	12,105
PARCELS	8,360
BASIC ASSESSMENT UNITS	+*), +
ASSESSMENT FOR ROUTINE MAINTENANCE	\$50,973
O & M ASSESSMENT	#~%0~
O & M ASSESSMENT RATE/BAU	" ""
TOTALS FOR ZONE 4	AMOUNT
ACRES	14,628
PARCELS	13,870
BASIC ASSESSMENT UNITS	16,219
ASSESSMENT FOR ROUTINE MAINTENANCE	\$107,990
TOTAL O & M ASSESSMENT	\$107,990

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 3
2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 1

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF OJAI ASSESSMENT FACTOR	AMOUNT
ACRES	1,802
PARCELS	2,884
BASIC ASSESSMENT UNITS	4,375
ASSESSMENT	\$18,227
ASSESSMENT RATE/BAU	\$4.17
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SAN BUENAVENTURA ASSESSMENT FACTOR	AMOUNT
ACRES	1,738
PARCELS	7,691
BASIC ASSESSMENT UNITS	9,829
ASSESSMENT	\$18,227
ASSESSMENT RATE/BAU	\$4.17
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	22,708
PARCELS	8,184
BASIC ASSESSMENT UNITS	14,801
ASSESSMENT	\$61,683
ASSESSMENT RATE/BAU	\$4.17
CITY OF OJAI ASSESSMENT FACTOR	AMOUNT
ACRES	1,802
PARCELS	2,884
BASIC ASSESSMENT UNITS	4,375
ASSESSMENT	\$18,227
ASSESSMENT RATE/BAU	\$4.17
CITY OF SAN BUENAVENTURA ASSESSMENT FACTOR	AMOUNT
ACRES	1,738
PARCELS	7,691
BASIC ASSESSMENT UNITS	9,829
ASSESSMENT	\$18,227
ASSESSMENT RATE/BAU	\$4.17

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 3

&'()*+),-./

2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 1

COUNTY OF VENTURA UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	22,708
PARCELS	8,184
BASIC ASSESSMENT UNITS	14,801
ASSESSMENT	\$21,429
ASSESSMENT RATE/BAU	\$1.45
ZONE 1 TOTALS	
ACRES	26,248
PARCELS	18,759
BASIC ASSESSMENT UNITS	29,005
ASSESSMENT	~!°!~

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 4
2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 2

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF CAMARILLO ASSESSMENT FACTOR	AMOUNT
ACRES	29
PARCELS	13
BASIC ASSESSMENT UNITS	224
ASSESSMENT	,\$\$#
ASSESSMENT RATE/BAU	~ %"
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF FILLMORE ASSESSMENT FACTOR	AMOUNT
ACRES	1,142
PARCELS	3,839
BASIC ASSESSMENT UNITS	4,275
ASSESSMENT	\$16,906
ASSESSMENT RATE/BAU	~ %"
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN CITY OF OXNARD ASSESSMENT FACTOR	AMOUNT
ACRES	9,255
PARCELS	39,125
BASIC ASSESSMENT UNITS	56,732
ASSESSMENT	~!~
ASSESSMENT RATE/BAU	~ %"
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF PORT HUENEME ASSESSMENT FACTOR	AMOUNT
ACRES),)
PARCELS	6,312
BASIC ASSESSMENT UNITS	4,921
ASSESSMENT	\$19,472
ASSESSMENT RATE/BAU	~ %"
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SANTA PAULA ASSESSMENT FACTOR	AMOUNT
ACRES	1,826
PARCELS	6,744
BASIC ASSESSMENT UNITS	9,120
ASSESSMENT	~"0"
ASSESSMENT RATE/BAU	~ %"

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 4

&'()*+),-./

2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 2

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF VENTURA ASSESSMENT FACTOR	AMOUNT
ACRES	5,424
PARCELS	23,994
BASIC ASSESSMENT UNITS	32,597
ASSESSMENT	\$128,949
ASSESSMENT RATE/BAU	. ~ %"
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	81,618
PARCELS	\$*##,
BASIC ASSESSMENT UNITS	27,581
ASSESSMENT	\$109,161
ASSESSMENT RATE/BAU	. ~ %"
CITY OF CAMARILLO ASSESSMENT FACTOR	AMOUNT
ACRES	29
PARCELS	13
BASIC ASSESSMENT UNITS	224
ASSESSMENT	\$1,117
ASSESSMENT RATE/BAU	# ~"
CITY OF FILLMORE ASSESSMENT FACTOR	AMOUNT
ACRES	1,142
PARCELS	3,839
BASIC ASSESSMENT UNITS	4,275
ASSESSMENT	\$17,099
ASSESSMENT RATE/BAU	! ~"
CITY OF OXNARD ASSESSMENT FACTOR	AMOUNT
ACRES	9,255
PARCELS	39,125
BASIC ASSESSMENT UNITS	56,732
ASSESSMENT	#\$~°!~"
ASSESSMENT RATE/BAU	\$10.28
CITY OF PORT HUENEME ASSESSMENT FACTOR	AMOUNT
ACRES),)
PARCELS	6,312
BASIC ASSESSMENT UNITS	4,921
ASSESSMENT	\$14,751
ASSESSMENT RATE/BAU	. ~"

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 4
&'()*+),-./
2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 2

CITY OF SANTA PAULA ASSESSMENT FACTOR	AMOUNT
ACRES	1,826
PARCELS	6,744
BASIC ASSESSMENT UNITS	9,120
ASSESSMENT	\$60,621
ASSESSMENT RATE/BAU	" "#
CITY OF SAN BUENAVENTURA ASSESSMENT FACTOR	AMOUNT
ACRES	5,424
PARCELS	23,994
BASIC ASSESSMENT UNITS	32,597
ASSESSMENT	\$192,221
ASSESSMENT RATE/BAU	# %~
COUNTY OF VENTURA UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	81,618
PARCELS	\$*##,
BASIC ASSESSMENT UNITS	27,581
ASSESSMENT	~0!""
ASSESSMENT RATE/BAU	\$1.36
ZONE 2 TOTALS	
ACRES	\$\$*\$,#
PARCELS	89,032
BASIC ASSESSMENT UNITS	135,451
ASSESSMENT	\$1,442,186

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 5
2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 3

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF CAMARILLO ASSESSMENT FACTOR	AMOUNT
ACRES	7,525
PARCELS	22,318
BASIC ASSESSMENT UNITS	30,689
ASSESSMENT	\$133,371
ASSESSMENT RATE/BAU	!~#
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF MOORPARK ASSESSMENT FACTOR	AMOUNT
ACRES	3,932
PARCELS	10,394
BASIC ASSESSMENT UNITS	13,023
ASSESSMENT	,#"#\$"
ASSESSMENT RATE/BAU	!~#
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF SIMI VALLEY ASSESSMENT FACTOR	AMOUNT
ACRES	12,849
PARCELS	37,339
BASIC ASSESSMENT UNITS	47,894
ASSESSMENT	\$208,123
ASSESSMENT RATE/BAU	!~#
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF THOUSAND OAKS ASSESSMENT FACTOR	AMOUNT
ACRES	11,552
PARCELS	35,518
BASIC ASSESSMENT UNITS	49,802
ASSESSMENT	\$216,433
ASSESSMENT RATE/BAU	!~#
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	64,108
PARCELS	10,225
BASIC ASSESSMENT UNITS	22,579
ASSESSMENT	\$98,162
ASSESSMENT RATE/BAU	!~#

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 5
&'()*+),-./
2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 3

CITY OF CAMARILLO ASSESSMENT FACTOR	AMOUNT
ACRES	7,525
PARCELS	22,318
BASIC ASSESSMENT UNITS	30,689
ASSESSMENT	\$153,358
ASSESSMENT RATE/BAU	# ~
CITY OF MOORPARK ASSESSMENT FACTOR	AMOUNT
ACRES	3,932
PARCELS	10,394
BASIC ASSESSMENT UNITS	13,023
ASSESSMENT	~
ASSESSMENT RATE/BAU	~ ~
CITY OF SIMI VALLEY ASSESSMENT FACTOR	AMOUNT
ACRES	12,849
PARCELS	37,339
BASIC ASSESSMENT UNITS	47,894
ASSESSMENT	\$185,183
ASSESSMENT RATE/BAU	~ \$0
CITY OF THOUSAND OAKS ASSESSMENT FACTOR	AMOUNT
ACRES	11,552
PARCELS	35,518
BASIC ASSESSMENT UNITS	49,802
ASSESSMENT	\$254,821
ASSESSMENT RATE/BAU	\$5.12
COUNTY OF VENTURA UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	64,108
PARCELS	10,225
BASIC ASSESSMENT UNITS	22,579
ASSESSMENT	~
ASSESSMENT RATE/BAU	~ ~
ZONE 3 TOTALS	AMOUNT
ACRES	\$\$*\$))
PARCELS	115,794
BASIC ASSESSMENT UNITS	163,987
ASSESSMENT	\$1,306,038

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

TABLE 6
2010/2011 ASSESSMENTS FOR NPDES COMPLIANCE IN ZONE 4

VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN THE CITY OF THOUSAND OAKS ASSESSMENT FACTOR	AMOUNT
ACRES	2,523
PARCELS	5,510
BASIC ASSESSMENT UNITS	8,562
ASSESSMENT	~#°# #
ASSESSMENT RATE/BAU	\$4.10
VENTURA COUNTY WATERSHED PROTECTION DISTRICT IN UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	12,105
PARCELS	8,360
BASIC ASSESSMENT UNITS	+*), +
ASSESSMENT	~°°" #
(Zone 4 NPDES Applys only to South Half of County)	
ASSESSMENT RATE/BAU	\$4.10
CITY OF THOUSAND OAKS ASSESSMENT FACTOR	AMOUNT
ACRES	2,523
PARCELS	5,510
BASIC ASSESSMENT UNITS	8,562
ASSESSMENT	!"°0%~
ASSESSMENT RATE/BAU	# !0
COUNTY OF VENTURA UNINCORP. ASSESSMENT FACTOR	AMOUNT
ACRES	12,105
PARCELS	8,360
BASIC ASSESSMENT UNITS	+*), +
ASSESSMENT	~
ASSESSMENT RATE/BAU	~ ~
ZONE 4 TOTALS	
ACRES	14,628
PARCELS	13,870
BASIC ASSESSMENT UNITS	16,219
ASSESSMENT	\$112,498

Note: Parcel count is for non exempt parcels and each parcel assessment is rounded down to even cent.

**TABLE 7
COMPARISON OF FY 2009/2010 AND FY 2010/2011 ASSESSMENT RATES**

ZONE	DISTRICT-ZONE	AREA	FY 2009 / 2010	CURRENT 2010/2011
1	14-04	UNINCORPORATED OPERATIONS & MAINTENANCE	\$20.44	~ !!
	14-04	OJAI OPERATIONS & MAINTENANCE	\$23.11	\$23.11
	14-04	SAN BUENAVENTURA OPERATIONS & MAINTENANCE	\$22.86	~ \$"
	14-20	UNINCORPORATED VCWPD NPDES	\$4.17	\$4.17
	14-25	OJAI VCWPD NPDES	\$4.17	\$4.17
	14-29	SAN BUENAVENTRA VCWPD NPDES	\$4.17	\$4.17
	14-54	UNINCORPORATED NPDES	\$1.45	\$1.45
	14-41	OJAI NPDES	\$7.82	0 \$~
	14-45	SAN BUENAVENTURA NPDES	-,<\$#	# %~
~	14-05	UNINCORPORATED OPERATIONS & MAINTENANCE	\$27.13	\$27.13
	14-05	FILLMORE OPERATIONS & MAINTENANCE	\$27.88	0 \$\$
	14-05	OXNARD OPERATIONS & MAINTENANCE	\$27.88	0 \$\$
	14-05	SANTA PAULA OPERATIONS & MAINTENANCE	\$27.13	\$27.13
	14-05	SAN BUENAVENTURA OPERATIONS & MAINTENANCE	\$27.13	\$27.13
	14-05	PORT HUENEME OPERATIONS & MAINTENANCE	\$27.80	0 \$~
	14-05	CAMARILLO OPERATIONS & MAINTENANCE	\$27.13	\$27.13
	14-21	UNINCORPORATED VCWPD NPDES	\$3.96	~ %"
	14-24	FILLMORE VCWPD NPDES	\$3.96	~ %"
	14-26	OXNARD VCWPD NPDES	\$3.96	~ %"
	14-28	SANTA PAULA VCWPD NPDES	\$3.96	~ %"
	14-30	SAN BUENAVENTURA VCWPD NPDES	\$3.96	~ %"
	14-31	PORT HUENEME VCWPD NPDES	\$3.96	~ %"
	14-32	CAMARILLO VCWPD NPDES	\$3.96	~ %"
	14-55	UNINCORPORATED NPDES	\$1.36	\$1.36
	14-40	FILLMORE NPDES	\$4.00	! ~
	14-42	OXNARD NPDES	\$10.28	\$10.28
	14-44	SANTA PAULA NPDES	-)<),	" "#
14-46	SAN BUENAVENTURA NPDES	-,<\$#	# %~	
14-47	PORT HUENEME NPDES	\$3.00	~ ~	
14-48	CAMARILLO NPDES	-,<##	# ~	
~	14-06	UNINCORPORATED OPERATIONS & MAINTENANCE	\$26.81	\$26.81
	14-06	CAMARILLO OPERATIONS & MAINTENANCE	\$26.81	\$26.81
	14-06	THOUSAND OAKS OPERATIONS & MAINTENANCE	\$25.87	# \$0
	14-06	SIMI VALLEY OPERATIONS & MAINTENANCE	\$25.80	# \$~
	14-06	MOORPARK OPERATIONS & MAINTENANCE	\$24.88	! \$\$
	14-22	UNINCORPORATED VCWPD NPDES	\$4.35	! #
	14-33	CAMARILLO VCWPD NPDES	\$4.35	! #
	14-34	THOUSAND OAKS VCWPD NPDES	\$4.35	! #
	14-36	SIMI VALLEY VCWPD NPDES	\$4.35	! #
	14-37	MOORPARK VCWPD NPDES	\$4.35	! #
	14-56	UNINCORPORATED NPDES	-#<##	~ ~
	14-49	CAMARILLO NPDES	-,<##	# ~
	14-50	THOUSAND OAKS NPDES	\$5.12	\$5.12
	14-52	SIMI VALLEY NPDES	\$3.87	~ \$0
14-53	MOORPARK NPDES	-#<##	~ ~	
!	14-07	UNINCORPORATED OPERATIONS & MAINTENANCE	-)<))	" ""
	14-07	THOUSAND OAKS OPERATIONS & MAINTENANCE	-)<))	" ""
	14-23	UNINCORP. VCWPD NPDES (SOUTH HALF ONLY)	\$4.10	\$4.10
	14-35	THOUSAND OAKS VCWPD NPDES	\$4.10	\$4.10
	14-51	THOUSAND OAKS NPDES	\$5.47	# !0

TABLE 8
2010/2011 AVERAGE ESTIMATED TOTAL ASSESSMENTS FOR TYPICAL LAND USES
IN ZONES 1,2,3, AND 4

USE	AREA (ACRES)	SITE USE CODE	IMPERV. FACTOR	FORMULA	BAU'S	ASSESSMENT AT DESIGNATED RATE PER BAU			
						AVERAGE RATE FOR ZONE 1 @\$31.36	AVERAGE RATE FOR ZONE 2 6," #0	AVERAGE RATE FOR ZONE 3 @\$33.18	AVERAGE RATE FOR ZONE 4 @\$13.50
VACANT	10.00	1012	0.01		1.25	\$39.20	\$45.71	\$41.48	\$16.88
TRACT HOME	0.20	1111	0.40	C	1.00	\$31.36	\$36.57	\$33.18	\$13.50
CUSTOM SINGLE FAMILY HOME	10.00	1110	0.40	H	2.23	\$69.93	\$81.55	\$73.99	\$30.11
RESIDENTIAL CONDO	#<#)	1129	0.72	A	0.54	\$16.93	\$19.75	\$17.92	\$7.29
TRAILER PARK	20.00	1400	0.72	N	91.25	\$2,861.60	\$3,337.01	\$3,027.68	\$1,231.88
APARTMENT BUILDING	3.00	1160	0.72	A	27.00	\$846.72	\$987.39	-"\$,<"	\$364.50
MANUFACTURING PLANT	15.00	2020	#<"	O	110.63	\$3,469.36	\$4,045.74	\$3,670.70	\$1,493.51
NEIGHBORHOOD SHOPPING CENTER	,<##	5030	#<"	D	,"<##	\$1,724.80	\$2,011.35	\$1,824.90	\$742.50
SHOPPING MALL	,#<##	5310	#<"	D	,"#<##	\$17,248.00	\$20,113.50	\$18,249.00	\$7,425.00
GAS STATION	0.25	5530	#<"	D	2.75	\$86.24	\$100.57	\$91.25	\$37.13
REST HOME	,<##	6516	#<#)	L	15.38	\$482.32	\$562.45	\$510.31	\$207.63
CHURCH	2.00	)\$##	#<#)	'	15.00	\$470.40	\$548.55	\$497.70	\$202.50
PRIVATE SCHOOL	20.00	6820	#<#)	L	17.25	\$540.96	\$630.83	\$572.36	\$232.88
GOLF COURSE	100.00	7412	0.20	M	41.00	\$1,285.76	\$1,499.37	\$1,360.38	\$553.50
GREENHOUSE	30.00	8171	#<"	O	112.50	\$3,528.00	\$4,114.13	\$3,732.75	\$1,518.75
AGRICULTURE	1.00	8010	0.019	&	0.2375	\$7.45	-"<)\$	-+<"	\$3.21
AGRICULTURE	"#<##	8010	0.019	&	19.00	\$595.84	\$694.83	\$630.42	\$256.50
AGRICULTURE	200.00	8010	0.019	&	47.50	\$1,489.60	\$1,737.08	\$1,576.05	\$641.25
AGRICULTURE	##<##	8010	0.019	&	118.75	\$3,724.00	\$4,342.69	\$3,940.13	\$48.00

TABLE %
2010/2011 BENEFIT ASSESSMENT - FLOOD CONTROL
COMPARISON OF FY 2010 REVENUE TO FY 2011 REVENUE

ZONE	AREA	BA RATE 1996-97 *78,97 FY 2010-2011	REVENUE Pr- : Yr. & % (2010)	REVENUE , 88-) * Yr (2010/2011)
1	Un+)'(8;(8<*-.	\$26.#)	\$385,725	.\$#° ""0
	Oj<+	\$35.10	\$153,+""	\$153,531
	S<) Bu-) <:-) *, 8<	\$32.93	\$324,,++	."~° ##\$
~	Un+)'(8;(8<*-.	\$32.45	-"\$* 881	.\$%!°\$""
	Fillm(8-	\$35.84	\$153,564	\$153,191
	Oxnard	\$42.12	\$2,377,455	."° ~\$%°%"
	Sa)* < Pa,><	\$37.74	\$342,912	."!!° ~\$\$
	S<) Bu-) <:-) *, 8<	\$36.\$\$	\$1,205,873	\$1,~#° ~0~
	Por* H,-)- ? -	\$34.+)	\$171,161	\$170,%"#
	<? <8+>>(	\$36.#\$	-"* 029	.\$°""
~	Un+)'(8;(8<*-.	\$31.16	-+#"* 813	."0~° 461
	((8;< 8A	\$29.23	\$388,081	."~\$° ##0
	<? <8+>>(	\$36.16	\$1,103,621	\$1,109,391
	Thous<nd OaAB	\$35.34	\$1,763,332	\$1,0#%!#~
	Sim+	\$34.02	\$1,629,),\$	\$1,~"\$° 0!!
!	Un+)'(8;(8<*-.	\$10.+)	\$81,383	\$81,~"
	Thous<nd OaAB	\$16.23	\$136,591	\$138,\$"#
			TOTAL \$11,833,444	TOTAL \$11,\$~° !~"

TABLE 10
2010/2011 BENEFIT ASSESSMENT - Watershed Protection
Summation of FY 2011 Benefit Assessment Units and Revenue

All Parcels								
ZONE	Location	BAUs	Acres	OPERATION & MAINTENANCE	WPD NPDES	CoPermittee NPDES	Revenue	Parcel Count
1	z1-county	14,801	171,384	\$302,496	\$61,683	\$21,429	\$385,607	10,796
	z1-ojai	4,375	2,469	\$101,100	\$18,227	\$34,204	\$153,531	2,980
	z1-ventura	9,829	3,003	\$224,658	\$40,945	-,+*\$,,	\$323,558	8,146
~	E~3'(*)F	27,581	573,005	\$748,244	\$109,161	\$37,462	\$894,866	12,172
	E~3C+>>?(8-	4,275	1,746	\$119,186	\$16,906	\$17,099	\$153,191	4,345
	E~3(@)<8.	56,732	13,191	\$1,581,631	\$224,423	\$583,043	\$2,389,096	44,782
	E~3B<)*<;<,><	9,120	2,362	\$247,391	\$36,076	\$60,621	\$344,088	7,748
	E~3:-)*,8<	32,597	7,692	\$884,202	\$128,949	\$192,221	\$1,205,372	26,360
	E~3;(8*7,-)-?-	4,921	2,323	\$136,742	\$19,472	\$14,751	\$170,965	6,504
	E~3'<?<8+>>(	224	197	\$6,063	-""	\$1,117	-"*#))	153
~	E~3'(*)F	22,579	135,501	\$605,299	\$98,162	-#	\$703,461	11,889
	E~3?((8;<8A	13,023	6,433	\$323,971	-),*")	-#	\$380,557	11,024
	E~3'<?<8+>>(	30,689	9,611	\$822,662	\$133,371	\$153,358	\$1,109,391	23,091
	z3-1000oaks	49,802	23,738	\$1,288,199	\$216,433	\$254,821	\$1,759,453	37,676
	E~3B+?+:<>>F	47,894	23,438	\$1,235,439	\$208,123	\$185,183	\$1,628,744	39,271
!	E!3'(*)F	+,)*,	229,435	\$50,973	\$30,650	-#	\$81,623	9,547
	z4-1000oaks	8,562	5,526	\$57,017	\$35,055	\$46,793	\$138,865	5,604
		~!!"!!!!	1,211,056	\$8,735,271	\$1,435,107	\$1,660,057	\$11,830,436	~!!"!##

Parcels with MORE THAN ZERO BAUs								
ZONE	Location	BAUs	Acres	OPERATION & MAINTENANCE	WPD NPDES	CoPermittee NPDES	Revenue	Parcel Count
1	z1-county	14,801	22,708	\$302,496	\$61,683	\$21,429	\$385,607	8,184
	z1-ojai	4,375	1,802	\$101,100	\$18,227	\$34,204	\$153,531	2,884
	z1-ventura	9,829	1,738	\$224,658	\$40,945	-,+*\$,,	\$323,558	7,691
~	E~3'(*)F	27,581	81,618	\$748,244	\$109,161	\$37,462	\$894,866	*###,
	E~3C+>>?(8-	4,275	1,142	\$119,186	\$16,906	\$17,099	\$153,191	3,839
	E~3(@)<8.	56,732	9,255	\$1,581,631	\$224,423	\$583,043	\$2,389,096	39,125
	E~3B<)*<;<,><	9,120	1,826	\$247,391	\$36,076	\$60,621	\$344,088	6,744
	E~3:-)*,8<	32,597	5,424	\$884,202	\$128,949	\$192,221	\$1,205,372	23,994
	E~3;(8*7,-)-?-	4,921	),)	\$136,742	\$19,472	\$14,751	\$170,965	6,312
	E~3'<?<8+>>(	224	29	\$6,063	-""	\$1,117	-"*#))	13
~	E~3'(*)F	22,579	64,108	\$605,299	\$98,162	-#	\$703,461	10,225
	E~3?((8;<8A	13,023	3,932	\$323,971	-),*")	-#	\$380,557	10,394
	E~3'<?<8+>>(	30,689	7,525	\$822,662	\$133,371	\$153,358	\$1,109,391	22,318
	z3-1000oaks	49,802	11,552	\$1,288,199	\$216,433	\$254,821	\$1,759,453	35,518
	E~3B+?+:<>>F	47,894	12,849	\$1,235,439	\$208,123	\$185,183	\$1,628,744	37,339
!	E!3'(*)F	+,)*,	12,105	\$50,973	\$30,650	-#	\$81,623	8,360
	z4-1000oaks	8,562	2,523	\$57,017	\$35,055	\$46,793	\$138,865	5,510
		~!!"!!!!	~!~0%~	\$8,735,271	\$1,435,107	\$1,660,057	\$11,830,436	~!~0!##

VI. APPENDICES

APPENDIX A

Assessment Formula and Impervious

Factors Relating to Assessor

Site Use Codes

APPENDIX B

Assessment Roll for FY 2011 Under Separate Volume

APPENDIX C

City Resolutions Under Separate Volume

**COPIES OF THE ASSESSMENT ROLL AND CITY
RESOLUTIONS ARE AVAILABLE FOR VIEWING AT:**

**Benefit Assessment Office of
Ventura County Watershed Protection District
Ventura County Government Center
Hall of Administration
800 South Victoria Avenue
Ventura, California 93009
Telephone:
(805) 650-4060
(805) 650-4073**

RESIDENTIAL

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
	0.01	1011	H VACANT LAND TO 5 ACRES (NOT ZONED FOR MULTI-FAMILY AND NOT TRACT)
	0.01	1012	H VACANT LAND OVER 5 ACRES (NOT ZONED FOR MULTI-FAMILY)
	0.01	1013	H VACANT LAND ZONED FOR MULTI-FAMILY, R-2 AND UP
	0.01	1014	H VACANT LAND TO 5 ACRES, RESIDENTIAL TRACT ONLY (NOT ZONED FOR MULTI-FAMILY)
C & H	0.40	1110	H CUSTOM SINGLE FAMILY DWELLING; SINGLE FAMILY DWELLING WITH A GUEST HOUSE, GARAGE APARTMENT OR SLEEPING ROOM
C & H	0.40	1111	H TRACT SINGLE FAMILY DWELLING; SINGLE FAMILY DWELLING WITH A GUEST HOUSE, GARAGE APARTMENT OR SLEEPING ROOM
C & H	0.40	1112	H SINGLE FAMILY DWELLING ON A PARCEL 5 ACRES OR LARGER
EXEMPT	#	1115	TIMESHARE CONDOMINIUM
C & H	0.40	1116	H MOBILE HOME ON OWNER'S LOT (NOT IN MOBILE HOME PARK OR MOBILE HOME CONDO)
A	0.72	1117	H MOBILE HOME ON OWNER'S LOT IN MOBILE HOME CONDO
EXEMPT	#	1118	MOBILE HOME IN MOBILE HOME PARK
EXEMPT	#	1119	H REO (REAL ESTATE OF OTHERS) MOBILE HOME
A	1	1120	FACTORY-BUILT HOUSING PER SEC 19971 HEALTH & SAFETY CODE
A	0.72	1128	H ATTACHED SFR - NOT CONDO
A	0.72	1129	H CONDOMINIUM, TOWNHOUSE, AND PLANNED DEVELOPMENT

MULTIPLE LIVING UNITS

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
C & I	0.40	1127	H MIXED RESIDENTIAL IMPROVEMENTS NOT OTHERWISE CLASSIFIABLE
A	0.72	1150	5 TO 9 LIVING UNITS - APARTMENT TYPE CONSTRUCTION - NOT CONDOMINIUMS
A	0.72	1160	10 OR MORE LIVING UNITS - APARTMENT TYPE CONSTRUCTION - NOT CONDOMINIUMS
A	0.72	1200	GROUP QUARTERS, RETIREMENT, ETC.
A	0.72	1300	RESIDENTIAL AND APARTMENT HOTELS (PERMANENT GUEST TYPE)
A & N	0.72	1400	MOBILE HOME PARK
A	0.72	1511	HOTEL (TRANSIENT LODGING)
A	0.72	1512	MOTEL (TRANSIENT LODGING)

TWO TO FOUR LIVING UNITS

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
C & I	0.40	1210	H TWO FAMILY DWELLING - DUPLEX
C & I	0.40	1222	H TWO COMPLETE SINGLE FAMILY DWELLINGS ON A PARCEL WHICH IS NOT FURTHER SUBDIVIDABLE UNDER CURRENT ZONING
C & J	0.40	1310	THREE FAMILY DWELLING - TRIPLEX
C & J	0.40	1321	THREE FAMILY DWELLING - A DUPLEX AND A SINGLE
C & J	0.40	1333	THREE INDIVIDUAL FAMILY DWELLINGS
C & K	0.40	1410	FOUR FAMILY DWELLING - QUADPLEX
C & K	0.40	1420	FOUR FAMILY DWELLINGS - TWO DUPLEXES
C & K	0.40	1421	FOUR FAMILY DWELLINGS - TRIPLEX AND A SINGLE
C & K	0.40	1432	FOUR FAMILY DWELLINGS - DUPLEX AND TWO SINGLES
C & K	0.40	1444	FOUR INDIVIDUAL FAMILY DWELLINGS
A	0.72	1513	BED AND BREAKFAST (TRANSIENT LODGING)

INDUSTRIAL

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
D & O	#<""	2000	SINGLE TENANT INDUSTRIAL, OTHER THAN MAJOR MANUFACTURING
	0.01	2011	VACANT INDUSTRIAL LAND TO 5 ACRES
	0.01	2012	VACANT INDUSTRIAL LAND OVER 5 ACRES
D & O	#<""	2020	MAJOR MANUFACTURING
D	#<""	2029	H CONDOMINIUM - INDUSTRIAL - ANY SIZE
D & O	#<""	2030	MULTI-TENANT INDUSTRIAL BUILDING (PRIMARILY FOR SMALL BUSINESSES)
D & O	#<""	2040	WAREHOUSING AND STORAGE, EXCEPT COLD STORAGE
D & O	#<""	2042	INDUSTRIAL STORAGE YARD
D & O	#<""	2041	COLD STORAGE
D & O	#<""	2050	MINI-WAREHOUSE
D & O	#<""	2060	OTHER - INDUSTRIAL IMPROVEMENTS THAT CANNOT BE CLASSIFIED BY ANY OTHER INDUSTRIAL SITE USE CODE
D & O	#<""	2071	PACKINGHOUSE, CITRUS, AND AVOCADOS
D & O	#<""	2072	PACKINGHOUSE, OTHER THAN CITRUS AND AVOCADOS
D & O	#<""	2099	OTHER INDUSTRIAL IMPS NOT ALREADY CLASSIFIED BY ANOTHER SITE USE CODE

TRANSPORTATION, COMMUNICATION, AND UTILITIES

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
EXEMPT	#	4000	UNDEDICATED OR PRIVATE STREETS, ROADS/WALKWAYS (INCLUDING CONDOMINIUM COMMON AREAS)
B & L	#<#	4100	TRANSPORTATION (TRUCK DEPOT, TERMINAL AND YARD, AIRPORTS)
EXEMPT	#	4111	RAILWAYS
EXEMPT	#	4400	PORTS AND HARBORS
EXEMPT	#	4590	HIGHWAY PARCELS
D	#<""	4600	PARKING LOTS AND PARKING GARAGES
	0.01	4700	COMMUNICATIONS
EXEMPT	#	4711	TELEPHONE COMPANY
EXEMPT	#	4810	STATE BOARD OF EQUALIZATION
EXEMPT	#	4812	G CO-GENERATION POWER PLANT
EXEMPT	#	4815	ELECTRIC UTILITY COMPANY-EDISON
EXEMPT	#	4819	ELECTRIC UTILITY COMPANY (OTHER)
EXEMPT	#	4823	GAS UTILITY COMPANY
EXEMPT	#	4830	WATER COMPANIES, MUTUAL, PRIVATE, AND UTILITY; SANITATION COMPANIES
EXEMPT	#	4831	WATER CONSERVATION DISTRICT
EXEMPT	#	4832	VENTURA COUNTY WATER WORKS
EXEMPT	#	4833	RESERVOIRS
EXEMPT	#	4836	MUNICIPAL WATER DISTRICT
EXEMPT	#	4837	WATER DISTRICT OFFICES
EXEMPT	#	4839	COUNTY WATER DISTRICTS
EXEMPT	#	4842	SANITARY AND SANITATION DISTRICTS
EXEMPT	#	4871	FLOOD CONTROL BASINS AND CHANNELS
EXEMPT	#	4873	STORM DRAINAGE MAINTENANCE DISTRICT-VENTURA COUNTY
EXEMPT	#	4875	DRAINAGE DISTRICT-OXNARD
	0.01	4890	WATER WELL SITE (PRIVATE)
	0.01	4911	PIPELINES, PETROLEUM
D	#<""	###	H SMALL (TO 3000 SQ. FT), ONE TENANT/OCCUPANT, NOT IN ANY TYPE OF SHOPPING CENTER
	0.01	5011	VACANT COMMERCIAL LAND TO 5 ACRES

TRANSPORTATION, COMMUNICATION, AND UTILITIES - (CONTINUED)

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
	0.01	5012	VACANT COMMERCIAL LAND OVER 5 ACRES
D	#<""	5020	LARGE (OVER 3000 SQ. FT), ONE TENANT/OCCUPANT, NOT IN ANY TYPE OF SHOPPING CENTER
D	#<""	5029	H COMMERCIAL CONDOMINIUMS
D	#<""	5030	MULTI-TENANT STORES, NEIGHBORHOOD SHOPPING CENTERS
D & O	#<""	5042	COMMERCIAL STORAGE YARD
B & L	#<)#	,#,#	G RETAIL AND RESIDENTIAL MIX
B & L	#<)#	,#)#	G RETAIL AND OFFICE MIX
D	#<""	5310	MAJOR SHOPPING CENTERS AND MALLS, COMMUNITY, REGIONAL AND SUPER-REGIONAL
D	#<""	5311	MAJOR DEPARTMENT STORES
D	#<""	5511	I AUTOMOTIVE SALES (NEW AND USED)
D	#<""	5512	I AUTOMOTIVE SALES (USED ONLY)
D	#<""	5530	SERVICE STATIONS
D	#<""	5811	H RESTAURANTS OR COFFEE SHOPS (DESIGNED AND USED AS SUCH)
D	#<""	5812	FAST-FOOD OR SHORT ORDER
D	#<""	#\$~	I BAR, NIGHT CLUB
D	#<""	#%~#	I AUTO WRECKING / DISMANTLING
B & L	#<)#	,\$\$\$	OTHER COMMERCIAL IMPROVEMENTS THAT CANNOT BE CLASSIFIED BY ANY OTHER COMMERCIAL SITE USE CODE

SERVICES

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
D	#<""	)###	H SMALL OFFICE BUILDING (TO APPROX. 3000 SQ. FT)
	0.01	6011	VACANT LAND (C-O, P-O, ETC)
D	#<""	6020	MID-SIZE OFFICE BUILDING (FROM APPROX. 3,000 SQ. FT TO APPROX. 10,000 SQ. FT)
D	#<""	6029	H GENERAL OFFICE, CONDOMINIUM
D	#<""	)#,#	G OFFICE / RESIDENTIAL MIX (SINGLE FAMILY RESIDENCE, APARTMENT, HOTEL)
D	#<""	6110	FINANCIAL INSTITUTIONS (BANKS, SAVINGS AND LOANS)
D	#<""	6241	I FUNERAL PARLOR (MORTUARY)
EXEMPT	#	""!~	I CEMETERY OR CEMETARY DISTRICT
D	#<""	6410	I (FROM PREVIOUS YEARS) VEHICLE REPAIR AND SALES
D	#<""	6411	I AUTOMOTIVE REPAIR SHOP
D	#<""	6416	I CAR WASH
D	#<""	6417	I CAR WASH (SELF SERVE)
D	#<""	6419	I AUTOMOTIVE OTHER (E.G. LUBE AND OIL, SMOG STATION, TUNE UP FACILITY, TOWING YARD)
D	#<""	6420	VEHICAL AND EQUIPMENT RENTAL
D	#<""	6510	MEDICAL / DENTAL OFFICES, NOT CONDOMINIUM
D	#<""	6513	HOSPITALS, FULL CARE
B & L	#<)#	6516	CONVALESCENT HOSPITALS AND REST HOMES
B & L	#<)#	6517	I MEDICAL CLINICS
C & H	0.40	6518	RESIDENTIAL CARE FACILITY (MODIFIED SINGLE FAMILIY DWELLING)
D	#<""	6529	H MEDICAL / DENTAL OFFICES, CONDOMINIUM
EXEMPT	#	6534	HOUSING AUTHORITY
EXEMPT	#	6535	REDEVELOPMENT AGENCY
D	#<""	),\$#	MAJOR OFFICE BUILDING, NOT CONDOMINIUM (USUALLY OVER 10000 SQ. FT OR MULTI-STORY)
D	#<""	),\$	MAJOR OFFICE BUILDING, CONDOMINIUM (USUALLY OVER 10000 SQ. FT OR MULTI-STORY)
EXEMPT	#	6711	CITY PROPERTY

SERVICES - (CONTINUED)

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
EXEMPT	#	6717	STATE PROPERTY
EXEMPT	#	6718	PUBLIC RETIREMENT SYSTEMS- STATE
EXEMPT	#	6719	COUNTY PROPERTY
EXEMPT	#	6730	POSTAL PROPERTY
EXEMPT	#	6731	FEDERAL PROPERTY NOT OTHERWISE CLASSIFIED
EXEMPT	#	)+,#	AIR FORCE AND COAST GUARD BASES INCL. POINT MUGU NAVAL BASE
EXEMPT	#	6801	UNDEVELOPED PUBLIC SECONDARY SCHOOL SITE
EXEMPT	#	6802	UNDEVELOPED PUBLIC SECONDARY SCHOOL SITE
EXEMPT	#	6803	UNDEVELOPED PUBLIC HIGHER EDUCATION SITE
EXEMPT	#	6812	PUBLIC KINDERGARTEN, ELEMENTARY AND JUNIOR HIGH SCHOOLS
EXEMPT	#	6814	PUBLIC HIGH SCHOOL
B & L	#<#	6815	NURSERY SCHOOLS, PRIMARY SCHOOLS AND CHILD CARE CENTER: NOT SUBJECT TO EXEMPTION
B & L	#<#	6820	HIGH SCHOOLS, COLLEGES AND UNIVERSITIES
EXEMPT	#	6822	COMMUNITY AND JUNIOR COLLEGES
EXEMPT	#	6823	STATE UNIVERSITY
B & L	#<#	)\$##	RELIGIOUS, CHARITABLE ORGANIZATIONS QUALIFYING FOR EXEMPTION
B & L	#<#	6901	FRATERNAL ORGANIZATIONS VETERAN ORGANIZATIONS ETC.- NOT QUALIFYING FOR THE WELFARE EXEMPTION
B & L	#<#	)\$\$\$	OTHER & PUBLIC SCHOOL ADMINISTRATION OFFICES NOT IN SCHOOL BUILDINGS

CULTURAL, ENTERTAINMENT, AND RECREATION

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
D	#<""	7212	MOTION PICTURE THEATRES, INDOOR
D	#<""	7213	MOTION PICTURE THEATRES, OUTDOOR
EXEMPT	#	7111	LIBRARY DISTRICT - SANTA PAULA UNION HIGH SCHOOL
B & L	#<#	7400	SPORT FACILITIES, EXCEPT GOLF COURSES AND BOWLING ALLEYS
E & M	0.20	7412	GOLF COURSES
D	#<""	7417	BOWLING ALLEYS
EXEMPT	#	7440	MARINAS
B & L	#<#	+,##	CAMPS, RESORTS, PRIVATE PARKS, NOT SUBJECT TO EXEMPTION
EXEMPT	#	7611	PARKS, INCLUDING PLAY FIELDS-DEVELOPED
EXEMPT	#	7612	PARKS AND RECREATION AREAS, UNDEVELOPED
E	0.20	7691	GREENBELT AREAS

RESOURCE PRODUCTION AND EXTRACTION

<u>FORMULA APPLIED</u>	<u>IMPERVIOUS FACTOR</u>	<u>SITE USE CODE</u>	<u>DESCRIPTION</u>
&	0.019	8010	L.C.A. FIELD AND SEED CROPS
&	0.019	8020	L.C.A. TRUCK CROPS
&	0.019	8030	L.C.A. ORCHARDS (MIXED)
&	0.019	8031	L.C.A. AVOCADOS
&	0.019	8032	L.C.A. ORANGES
&	0.019	8033	L.C.A. LEMONS
&	0.019	8034	L.C.A. GRAPEFRUIT
&	0.019	8035	L.C.A. DECIDUOUS (APRICOTS, WALNUTS, KIWIS, ETC)
&	0.019	8036	L.C.A. VINEYARDS
&	0.019	8037	L.C.A. MIXED (ORCHARDS - ROW CROPS)

RESOURCE PRODUCTION AND EXTRACTION - (CONTINUED)

<u>FORMULA</u> <u>APPLIED</u>	<u>IMPERVIOUS</u> <u>FACTOR</u>	<u>SITE USE</u> <u>CODE</u>	<u>DESCRIPTION</u>
&	0.019	8040	L.C.A. LIVESTOCK OPERATIONS
D & O	#<""	"#,#	L.C.A. ANIMAL SPECIALTIES (EGG PRODUCTION, POULTRY, ETC)
EXEMPT	#	"#)#	L.C.A. PASTURE AND RANGE LAND
&	0.019	"#+#	L.C.A. COVERED OR OPEN FIELD, NURSERY CROPS, AND SEEDS
D & O	#<""	8071	L.C.A. GREENHOUSES, INCLUDING HYDROPONIC FARMING
&	0.019	8072	L.C.A. FIELD FLOWERS
&	0.019	8073	L.C.A. SOD FARMS
&	0.019	8110	L.C.A. FIELD AND SEED CROPS
&	0.019	8120	TRUCK CROPS
&	0.019	8130	ORCHARDS AND VINEYARDS (MIXED)
&	0.019	8131	AVOCADOS
&	0.019	8132	ORANGES
&	0.019	8133	LEMONS
&	0.019	8134	GRAPEFRUIT
&	0.019	8135	DECIDUOUS (APRICOTS, WALNUTS, KIWIS, ETC)
&	0.019	8136	VINEYARDS
&	0.019	8137	MIXED (ORCHARDS - ROW CROPS)
&	0.019	8140	LIVESTOCK OPERATIONS
D & O	#<""	8150	ANIMAL SPECIALTIES (EGG PRODUCTION, POULTRY, ETC)
EXEMPT	#<###	8160	PASTURE AND RANGE LAND
&	0.019	8170	COVERED OR OPEN FIELD, NURSERY CROPS, AND SEEDS
D & O	#<""	8171	GREENHOUSES, INCLUDING HYDROPONIC FARMING
&	0.019	8172	FIELD FLOWERS
&	0.019	8173	SOD FARMS
EXEMPT	#<###	8189	AGRICULTURAL DISTRICT, 31 ST (STATE OF CALIFORNIA)
&	0.019	8190	MISCELLANEOUS USES; TREE FARM, ETC
&	0.019	8200	AGRICULTURAL RELATED ACTIVITIES
EXEMPT	#<###	8298	SOUTH VENTURA COUNTY CONSERVATION DISTRICT
	0.01	"##	MINING; MINERALS, SAND, GRAVEL, CLAY, STONE, (INCLUDING RIP-RAP, FERTILIZER, ETC.)
	0.01	8532	PRODUCING OIL WELL
D & O	#<""	"#)#	NATURAL GAS COMPRESSOR PLANTS
D & O	#<""	8561	NATURAL GAS PROCESSING PLANTS
	0.01	8562	WATER FLOODING FACILITY - OIL WELL
D & O	#<""	8563	PETROLEUM TERMINAL
D & O	#<""	8564	BOOSTER PLANT
EXEMPT	#	8911	NONPRODUCING MINERAL RIGHT - FEE
EXEMPT	#	8912	NONPRODUCING MINERAL RIGHT - LIMITED RIGHT OF SURFACE ENTRY
EXEMPT	#	8913	RESERVED FOR MR - FUTURE USE
EXEMPT	#	8914	RESERVED FOR MR - FUTURE USE

UNDEVELOPED LAND AND WATER

<u>FORMULA</u>	<u>IMPERVIOUS</u>	<u>SITE USE</u>	<u>DESCRIPTION</u>
<u>APPLIED</u>	<u>FACTOR</u>	<u>CODE</u>	
EXEMPT	#	####	SPIKE STRIPS
EXEMPT	#	9100	UNDEVELOPED AND UNUSED LAND (BRUSH HILLS, DRY RIVERBEDS, BARRANCAS)
EXEMPT	#	9200	NONCOMMERCIAL FOREST
EXEMPT	#	9211	NATIONAL FOREST
EXEMPT	#	9300	WATER AREAS; RIVERS, LAKES, RESERVOIRS, OCEAN, HARBORS, ETC

Note 1: The term "subject to exemption" does not refer to exemption from Benefit Assessment.

Note 2: For Fiscal Year 1999/2000 D beyond: Site Use Code (SU / 6410 was eliminated. SUCs 5645, 6419, 6411, 5511, 5512, 5645, 6416, 6417, 6241, 6241, and 6517 were added- having been segregated from more general land uses by the Assessor's Office. Those SUCs which were so changed are indicated in this Appendix underlined, in bold face type with a "#" notation.

Note 3: For Fiscal Year 2000/2001 & beyond: Site Use Code (SUC) 4812 (Co-generation power plants) is being added. The SUC which was so changed

Note 4: For Fiscal Year 2005-2006 & beyond: Site Use Codes (SUC) 5050 and 5060 were added, with Formulas B&L applied, and Site Use Code 6050

HSPECIAL CONDITIONSJ

A: Uniform Acreage Applied.

<u>SITE USE CODE</u>	<u>UNIFORM ACREAGE APPLIED:</u>	
1117 & 1400	#<#+	*D: For Mobil Home Park Lots: Uniform acreage Applied. For Mobil Home Complexes- regular calculations apply.
1128	#<#)	
1129	#<#)	
2029	#<#+	
5029	#<#+	
6029	#<#+	
6529	#<#+	

<u>SITE USE CODE</u>	<u>UNIFORM ACREAGE APPLIED:</u>	<u>WHEN ASSESSMENT RECORDS SHOW:</u>
1011	0.20	AREA= 0.0
1012	0.20	AREA= 0.0
1013	0.20	AREA= 0.0
1014	0.20	AREA= 0.0
1110	0.20	AREA= 0.0
1111	0.20	AREA= 0.0
1112	0.20	AREA= 0.0
1116	0.20	AREA= 0.0
1127	0.20	AREA= 0.0
1210	0.40	AREA= 0.0
1222	0.40	AREA= 0.0
,###	0.40	AREA= 0.0
5811	0.40	AREA= 0.0
)###	0.40	AREA= 0.0
),\$\$	0.23	AREA= 0.0

B: Parcels in the North Half of Ventura CountF inside Flood Zone 4 are exempt from NPDES char9-B

C: Real Estate of Others &UC 1119/ is exempt from Benefit Assessment.

***D: When SUC 1400 refers to Mobil Home Complex, Regular Calculations apply. When SUC 1440 refers to individual Mobil Home Park Lots - the uniform acreage applies**

VII. FORMULAS

VII. FORMULAS

- (.72) A 9.0 BAU / ACRE X AA
- (.60) B 7.5 BAU / ACRE X AA
- (.40) C 5.0 BAU / ACRE X AA
- (.88) D 11.0 BAU / ACRE X AA
- (.20) E 2.5 BAU / ACRE X AA
- (.01) F 0.125 BAU / ACRE X AA
- (.019) G 0.2375 BAU / ACRE X AA
- (.40) H 1.0 BAU + [(AA - 0.2) X 0.125]
- (.40) I 2.0 BAU + [(AA - 0.4) X 0.125]
- (.40) J 3.0 BAU + [(AA - 0.6) X 0.125]
- (.40) K 4.0 BAU + [(AA - 0.8) X 0.125]
- (.60) L 15.0 BAU + [(AA - 2.0) X 0.125]
- (.20) M 30.0 BAU + [(AA - 12.0) X 0.125]
- (.72) N 90.0 BAU + [(AA - 10.0) X 0.125]
- (.88) O 110.0 BAU+ [(AA - 10.0) X 0.125]

- Where: “AA”= acreage of parcel and “BAU”= Basic Assessment units assigned.
- Imperviousness factors shown in parentheses, i.e.: “(.40)”.
- Where two formulas are given in Appendix “A”, Formulas H through O apply only if sufficient acreage is present to qualify for the amount shown to be subtracted from acreage in said formulas.

ATTACHMENT 69



City of San Clemente Clean Ocean Program & Fee **Frequently Asked Questions**

What is the Clean Ocean Program?

It is the City's effort to prevent stormwater and urban runoff pollution from entering the storm drain system and being discharged at the beach.

Why does the City need a Clean Ocean Program?

- To protect the environment (water quality in local channels and coastal waters);
- To protect public health and safety (from bacteria and other pollution that could reach the beach);
- To protect local quality of life (local business/tourism, "beach town" reputation, etc.); and
- To meet State Water Code and Federal Clean Water Act permit requirements issued to South Orange County cities by the State.

Who developed the Clean Ocean Program?

The City prepared an Urban Runoff Management Plan (URMP), which included participation and feedback from the community as well as the City's Coastal Advisory Committee (local citizens appointed by the City Council to consider and provide advice on coastal and water quality issues). The URMP guides the Clean Ocean Program, and outlines activities and projects to meet the State and Federal water quality requirements and protect local water quality.

What does the Clean Ocean Program include?

- *Runoff treatment projects*
 - Poche Beach: A treatment system was constructed and is maintained to filter and kill bacteria in the runoff before it reaches the beach. Construction was completed in March of 2009. The system treats up to 1.1 million gallons per day. Weekly water quality tests indicate that the UV treatment removes between 95% - 99% of the bacteria in the storm drain runoff before it discharges to the beach. The current water quality grade at Poche Beach is an A+.
 - North Beach: A system was constructed to divert dry weather runoff away from North Beach and send it to the City's Water Reclamation Plant for treatment. The system started operating on June 1, 2009. It diverts and filters about 350,000 gallons per day. The current water quality grade at North Beach is an A+.
 - Underground storm drain units were installed to remove trash, oil & grease and sediment from runoff before it gets to the beach. Six units have been installed. They are located near Calafia Beach, in the Pier Bowl area, at the west ends of El Portal, at the end of Linda Lane and at Mariposa. In 2013, 35 cubic yards of material was captured and removed by these units. This is material that would have otherwise have ended up in the ocean.
- *Pollution prevention activities*
 - Street Sweeping: the City sweeps public residential streets twice per month and major streets and business areas about 3 times per week. Over 22,000 tons of material has been collected over the last ten several years, enough to fill 550 large (40 cubic yard) trash bins.
 - Catch Basin Inspection and Cleaning: the City inspects at least 2,205 catch basins annually, cleaning them as needed. In 2013, 2,432 catch basins were cleaned and a total of 914 cubic feet of material was removed.
 - Water Quality Testing: water samples from over 20 locations throughout town are sampled each year to help identify potential problem areas and monitor quality progress over time. Flow measurements are also taken to help measure progress in reducing urban runoff flows.
 - Special Studies: the City consulted with scientists to conduct an in depth investigation to find sources of bacteria in the Poche Beach watershed. A year long study which included molecular

City of San Clemente Clean Ocean Program & Fee **Frequently Asked Questions**

marker testing culminated in focused recommendations and a strategic plan for reducing bacteria at Poche Beach. The final report of the study is located on the Clean Ocean Program website at www.sccleanocean.org.

- **Commercial, Industrial and Construction Site Inspections:** Inspections of businesses, industrial facilities and construction sites are conducted to make sure these sites are using proper Best Management Practices (BMPs) to prevent pollution from entering the storm drain system and reaching the beach. Over 9,000 inspections have been completed in the last 10 years.
- **Spill Cleanups and Storm Drain Maintenance:** A 24/7 hotline number (**366-1553**) is in place to respond to and cleanup spills or investigate reported illegal discharges. In addition, the City performs ongoing maintenance to ensure proper function of the storm drain system and inspects all public catch basins annually and removes materials that might be discharge into the system.
- **Enforcement of Anti-pollution Ordinances:** Dedicated officials enforce water quality laws to identify and correct violations. Depending on the severity of the violation, enforcement may include verbal warnings, written correction orders, and/or fines of \$100, \$200, or \$500 per violation.
- **Public Outreach and Education:** Efforts promote awareness of stormwater and urban runoff pollution impacts, and ways the public can help prevent this pollution from happening in the first place.

What is the cost of implementing the Clean Ocean Program?

The cost to implement the program is about \$2.2 million per year.

What is the cost of not implementing the Clean Ocean Program?

The City could be liable for large fines if the State finds that the City is not meeting the requirements of the stormwater permit regulations. Also, there are potential economic impacts (tourism, real estate values, etc.) if the City does not work to protect its healthy beach town reputation.

How is the Clean Ocean Program funded?

By a Clean Ocean utility fee charged to property owners. The fee is collected as a line item on the monthly utility bill for owners that get water service from the City. The fee is charged monthly but collected via a separate twice-yearly bill to San Clemente property owners that get water service from other providers (e.g. South Coast Water District or Santa Margarita Water District).

Why do property owners get charged the Clean Ocean Fee?

Developed and graded properties contribute runoff to the storm drain system (which includes pipes, channels, drain inlets and street gutters). This runoff contains or picks up pollution before it enters the storm drain, which the City must then address. Since providing storm drain and water quality services is like other utility services provided by the City (e.g. drinking water and sewer service), it is appropriate that property owners pay for the cost of this service.

How long will the continued fee be in effect? When will it end?

If approved by San Clemente property owners, the existing Clean Ocean Fee would be continued for an additional six and one-half (6.5) years, and would expire on June 30, 2020.

How much will the fee increase over the next 6.5 years?

The continued Clean Ocean Fee would be fixed and would not increase over the entire period.

Why are property owners voting on this fee?

**City of San Clemente Clean Ocean Program & Fee
Frequently Asked Questions**

Under the provisions of California Proposition 218, property owners must approve new property fees adopted by cities.

What is the change from the existing to the proposed Clean Ocean Fee?

Single Family Residential Monthly Fee		
	Current Fee	Proposed New Fee
Private street	\$ 4.39	\$ 5.10
Public street	\$ 5.02	\$ 6.23

Multi-Family Residential Monthly Fee		
	Current Fee (per residential unit)	Proposed New Fee (per residential unit)
Private street	\$3.51	\$4.08
Public street	\$4.01	\$4.98

Non-Residential (Commercial, Industrial, Business Park) Monthly Fee		
	Current Fee (per acre or fraction thereof)	Proposed New Fee (per acre or fraction thereof)
Private street	\$43.90	\$51.00
Public street	\$50.20	\$62.30
Note: Almost all non-residential streets within the City are public streets.		

Undeveloped, Graded Property Monthly Fee				
	Current Fee		Proposed New Fee	
	<i>2 acres or less</i>	<i>Each acre over 2 add:</i>	<i>2 acres or less</i>	<i>Each acre over 2 add:</i>
Private street	\$2.20	\$0.44	\$2.55	\$0.51
Public street	\$2.51	\$0.50	\$3.12	\$0.62
Note: There is no clean ocean fee charge for undeveloped, ungraded parcels.				

Note: Properties on private streets are charged a lower rate since the City doesn't provide street sweeping service on private streets.

How is the fee calculated?

The fee is based on a parcel's expected contribution of runoff, which is determined by an estimate of the impervious area on that parcel. Impervious areas include such things as buildings and pavement, which prevent or restrict storm water from getting into the soil and increase runoff from a parcel.

Why is the existing Clean Ocean Fee being proposed to be continued?

The fee funds a stormwater quality program that the State requires the City to implement. Since the fee was last approved, the State revised and adopted a new stormwater permit for the south Orange County area that contains more rigorous requirements. Also, the State recently adopted new requirements for bacteria pollution for which the City must comply.

What happens if continuation of the existing Clean Ocean Fee is not approved?

If the Clean Ocean Fee is not continued, the City will need to support the Clean Ocean Program with some other funding source. The most likely source would be the General Fund, which would result in about \$2 million each year that would not be available for other needed projects and programs within the City.

City of San Clemente Clean Ocean Program & Fee **Frequently Asked Questions**

How and when will the vote occur?

All record owners of property within the City that are directly subject to the proposed fee will receive an official mail-in ballot with a postage paid addressed return envelope. The ballots will be mailed to property owners on October 25, 2013. Return ballots are due on December 10, 2013.

How do I cast my vote?

Simply fill out the ballot and mail or deliver it to the San Clemente City Clerk by the due date noted on the ballot.

How do I get more information?

More information about the proposed fee continuation is available on the City's website at www.sccleanocean.org. You may also call the Environmental Programs Section at (949) 361-8204 or send an email to cleanwater@san-clemente.org.

What's the difference between storm drains and sewers – doesn't it all get treated?

Like most other cities, the City of San Clemente owns and operates a storm drain system, which is the network of channels and pipes that collect stormwater and urban runoff and discharges it into the ocean. Unlike sewer systems that send sewage to a treatment plant before being discharged, most storm drain systems, including the City's, were built to collect and convey runoff to prevent flooding but not to treat urban water runoff. Therefore, any pollutants that runoff carries into the storm drain system are discharged untreated along the City's shoreline.

Do other cities have a Clean Ocean Program?

They may call it something else, but all cities in the urbanized areas of Southern California are required by the State to implement stormwater and urban runoff programs to prevent discharges of pollution to creeks, rivers and the ocean.

How do we know that the Clean Ocean Program is working?

- The City records amounts of trash picked up by street sweepers and removed from underground treatment devices.
- Larger treatment projects include monitoring to compare water quality before and after treatment.
- The City tracks the number of enforcement actions and inspections to document these efforts.

Why should San Clemente property owners pay to clean up pollution from upstream cities?

Unlike most cities in Southern California, San Clemente's city boundary is very similar to the local watershed boundary. This means that San Clemente is a self-contained watershed, and that there are no upstream cities that contribute pollution through our local watershed. So the pollution in our storm drains comes from San Clemente properties, and not from out-of-town areas.

How can I help?

To learn about simple tips to help prevent urban runoff pollution, please visit www.sccleanocean.org or www.ocwatersheds.com.

To learn about potential volunteer opportunities (e.g. beach cleanups), please visit www.scwatersheds.com.

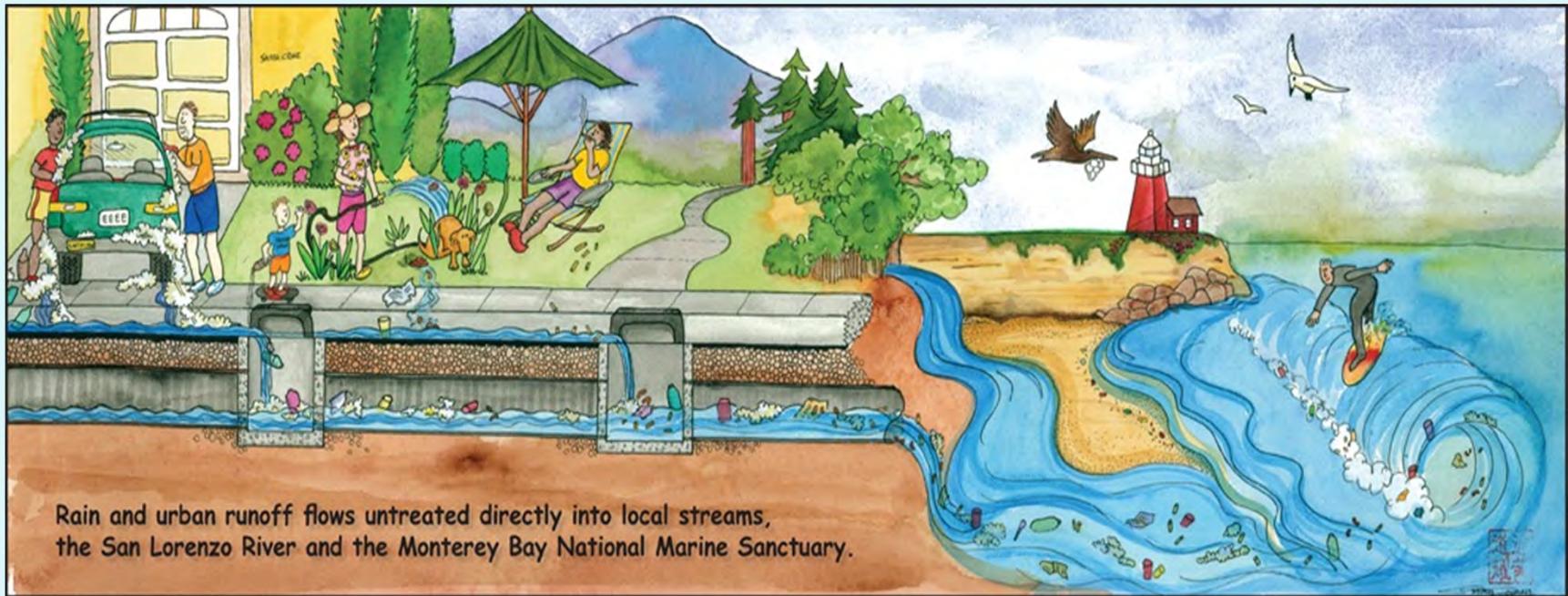
ATTACHMENT 70

City Storm Water Program and Measure E: Clean River, Beaches and Ocean Fund

FY 2015 Highlights

Dedicated funding for programs
to prevent pollution from reaching our waterways
and beaches

Urban Runoff



Rain and urban runoff flows untreated directly into local streams, the San Lorenzo River and Monterey Bay

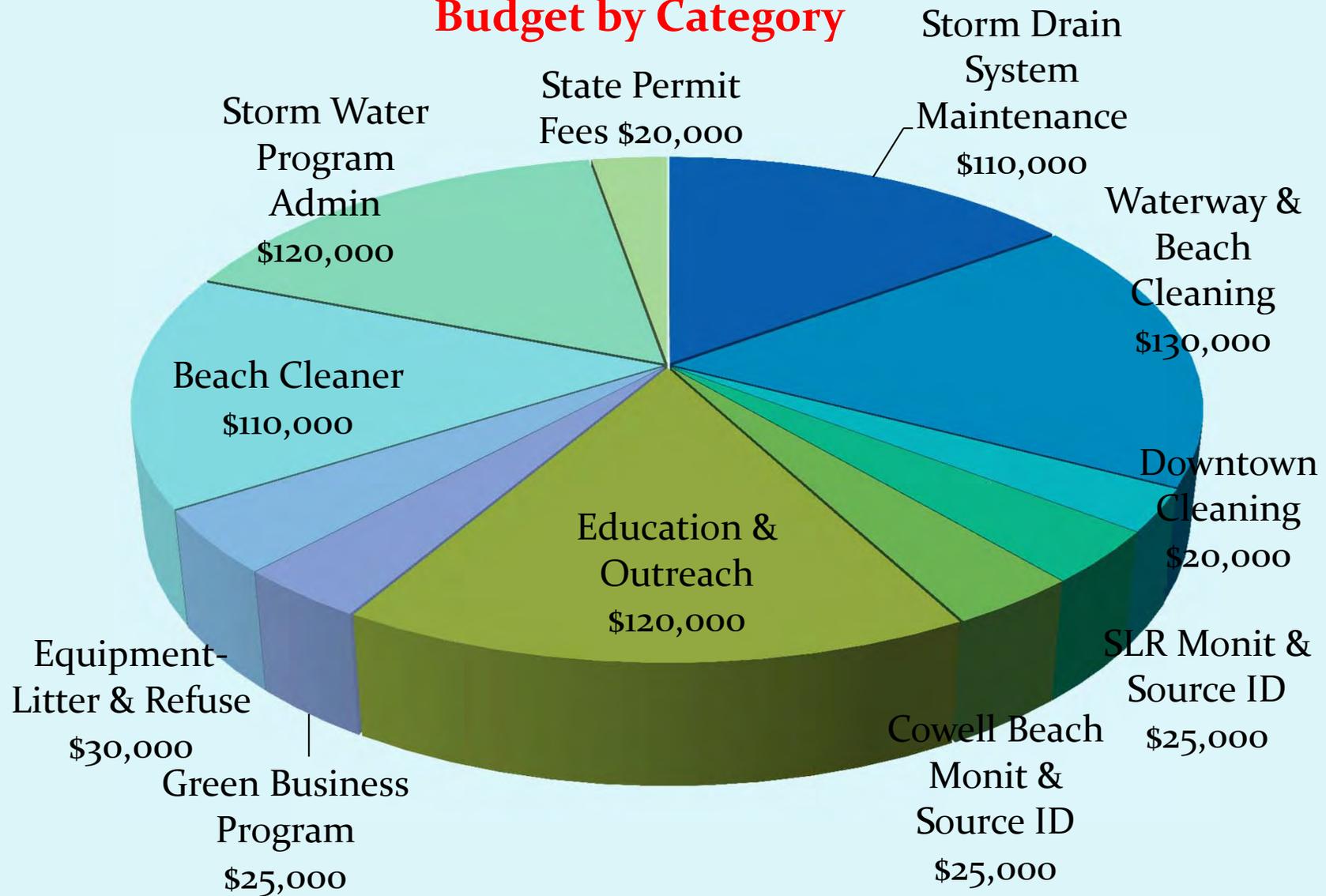
FY 2015 Expenses

- Storm Drain System Maintenance: \$110,000
- Waterway & Beach Cleaning: \$130,000
- Downtown Cleaning: \$20,000
- San Lorenzo River Monitoring & Source ID: \$25,000
- Cowell Beach Monitoring & Source ID: \$25,000
- Education & Outreach: \$120,000
- Green Business Program: \$25,000
- Equipment: Litter & Refuse: \$30,000
- Beach Cleaner: \$110,000*
- Storm Water Program Staff: \$120,000
- State Permit Fees=\$20,000

Revenue: \$630,000 Expenses: \$740,000

FY 2015 Expenses

Budget by Category



Municipal Operations

Focus on cleaning:

To keep debris & pollutants from flowing into the San Lorenzo River and Monterey Bay

- Storm drain pipelines
- Pump Stations
- River Toe Ditches
- Street Catch basins



Municipal Operations

City Crews clean:

- Storm drain pipelines-9 miles
- River pump stations-5 vaults



Municipal Operations

Storm Drain System Inspection & Cleaning:

- Extensive catch basin inspection & cleaning program. All downtown catch basins plus outlying areas inspected & cleaned.
 - Labor costs
 - Vactor Operation
 - Debris Disposal
 - Televising storm drain lines



Cost: \$110,000

Waterway, River Levee & Beach Cleaning

Ongoing Maintenance Efforts:

- San Lorenzo River
 - Parks Temp Staff-\$70,000
 - Contracted cleanups-\$25,000
 - Subtotal: \$95,000
- Cowell & Main Beaches
 - Wharf Temp Staff \$35,000

Cost: \$130,000



Beach Cleaning

Beach Cleaning Machine for Cowell & Main Beaches



Cherrington Beach Cleaner
Cost: \$110,000

Waterway, River Levee & Beach Cleaning

Parks Rangers Temp Staff-cleanups & restoration efforts



Cost=\$70,000

Municipal Operations

Downtown Cleaning: Hand Sweeping-Hope Services



Cost=\$20,000

Municipal Operations

Downtown Cleaning: Alleyways



Cleaned by contractors

River Levee & Beach Volunteer Cleanups

Save Our Shores:

- San Lorenzo River-Adopt a Levee cleanups
- San Lorenzo River-4 seasonal cleanups
- Annual Coastal Cleanup Day-beach & river cleanups
- July 4th & 5-beach outreach & cleanups
- Disposal of debris

Cost=\$25,000



Education & Outreach Program

School Programs:

- O'Neil Sea Odyssey-Field trip & class 4-5th grades
- Save The Whales-K-12th Grade class presentations
- Save Our Shores-Middle & High School assemblies and classes
- ZunZun-Musical Assemblies K-6th grades



Cost=\$35,000

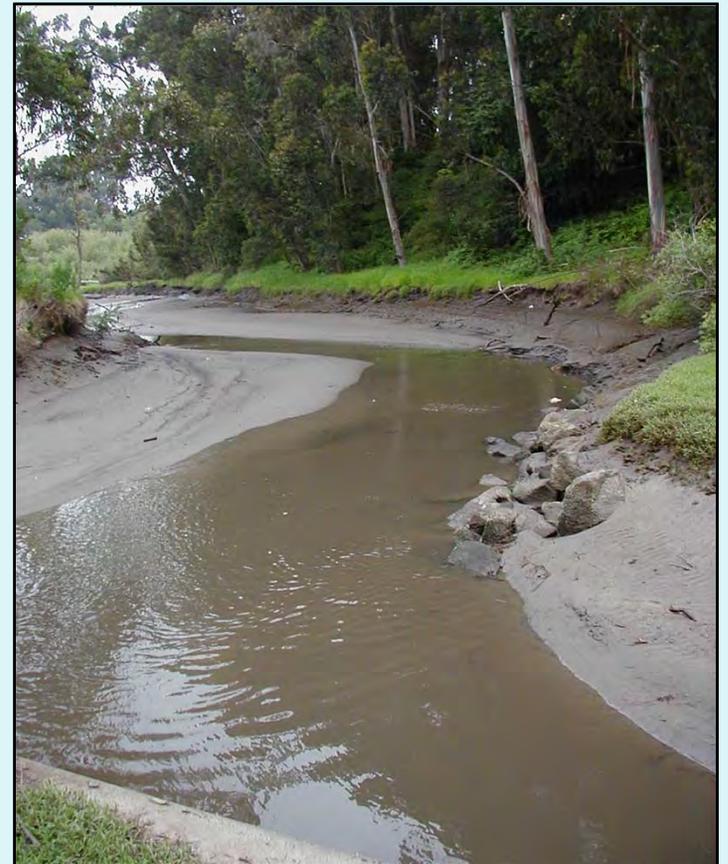
Education & Outreach Program

Volunteer Monitoring & Stewardship:

- CWC Snapshot Day
- CWC San Lorenzo River Alliance



Cost=\$15,000



Education & Outreach Program

Residential Outreach:

- Arana Gulch Watershed Coordinator
- EA-Our Water Our World: pesticides & herbicides
- EA-Green Gardner Program
- RCD-Low Impact Development
- SW agencies-Region-wide TV ads

Cost=\$15,000



Education & Outreach Program

Business Outreach & Recognition:

- City Clean Ocean Business Program
- Monterey Bay Green Business Program
- Green Gardner/
Landscaping Program

Cost=\$30,000



Education & Outreach Program

Litter & Illegal Dumping:

Catch Basin Labeling (SOS)



Cost=\$10,000



Cigarette Butt
“Bait Tank”
containers

San Lorenzo River Pollution Prevention

Litter & Illegal Dumping

- Trash/Recycling and Cigarette Butt containers on SLR levee & other areas



Cost=\$15,000

SLR Watershed Monitoring

State Total Maximum Daily Load Limits: San Lorenzo River

- **TMDL: Bacteria and Sediment**
- State requires monitoring, remedial measures & reports
- Monitoring of SLR, Branciforte & Carbonera Creeks by City Lab & Env Compliance Program
- Results indicate birds and sediment are primary sources of elevated bacteria levels in SLR
- City is an active partner in the SLRA led by Coastal Watershed Council (staff time, funding, specialized lab work, data sharing)



Cost= \$25,000 (Lab)

Cowell Beach

- **City participates in Cowell Beach Working Group**
- **City & County both monitor Cowell Beach**
- **Results show low bacteria levels during winter months**
- **Sewer source unlikely since levels not high year round**



In 2014, City added caffeine test as indicator of sewage (none found so far)
In 2015, City conducted a preliminary bacteria gradient study

New State Requirements

Outfall Inventory and Sampling

- Staff checked 236 storm drain outfalls
- 26 outfalls had flows during summer and were sampled
- Results showed 1 suspect outfall which led staff to identify a cracked storm drain



New State Requirements

Construction: Erosion Control

- Grading ordinance revised June 2014: Projects need to submit erosion & sediment control plans
- Increased PW and Building staff oversight of construction projects



New State Requirements

Development: Low-Impact Design

- New (2014) requirements to collect & infiltrate (sink) storm runoff on property
- Applies to private developments, retrofits, and City projects
- *Examples of LID techniques:*

Pervious Pavement



Bio-retention



Drainage Swale



Rain Barrel



Low-Impact Development on Recent Private Projects

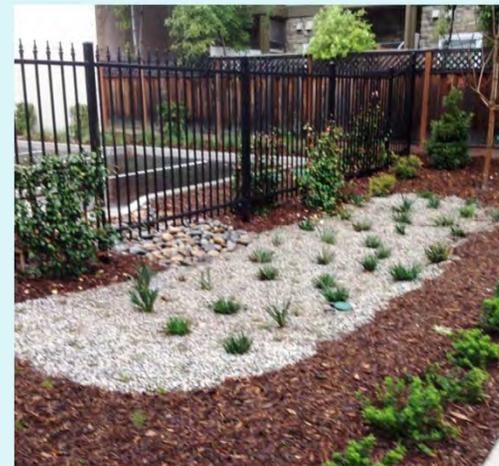
Madrone Street (Sports Authority)



Frederick Street (Multi-family)



West Cliff Drive (Multi-family)



Low-Impact Development on Recent City Projects

Kaiser Permanente Arena



Wharf Roundabout (not vegetated yet)



Arana Gulch Multi-Use Trail



Tannery Arts New Parking Lot



Grants & Projects

State Prop 84 Grant: Low Impact Development Design & Build Parking Lot #9

- Goal to reduce runoff & pollutant loads to River
- LID to sink rain runoff and divert pollutants into soil



Construction completed August 2015

Grants & Projects

State Prop 84 Grant: Low Impact Development Parking Lot #9

- Sloping & curb cuts to bio-swales redirect 75% of lot runoff



Grants & Projects

Bio-swales installed to sink rain runoff & filter pollutants



Vegetated bio-swale with curb cuts

Grants & Projects

Bio-swales installed to sink rain runoff & filter pollutants



Vegetated bio-swale with curb cuts

Grants & Projects

State Prop 84 Grant: Low Impact Development Design & Build Parking Lot #9

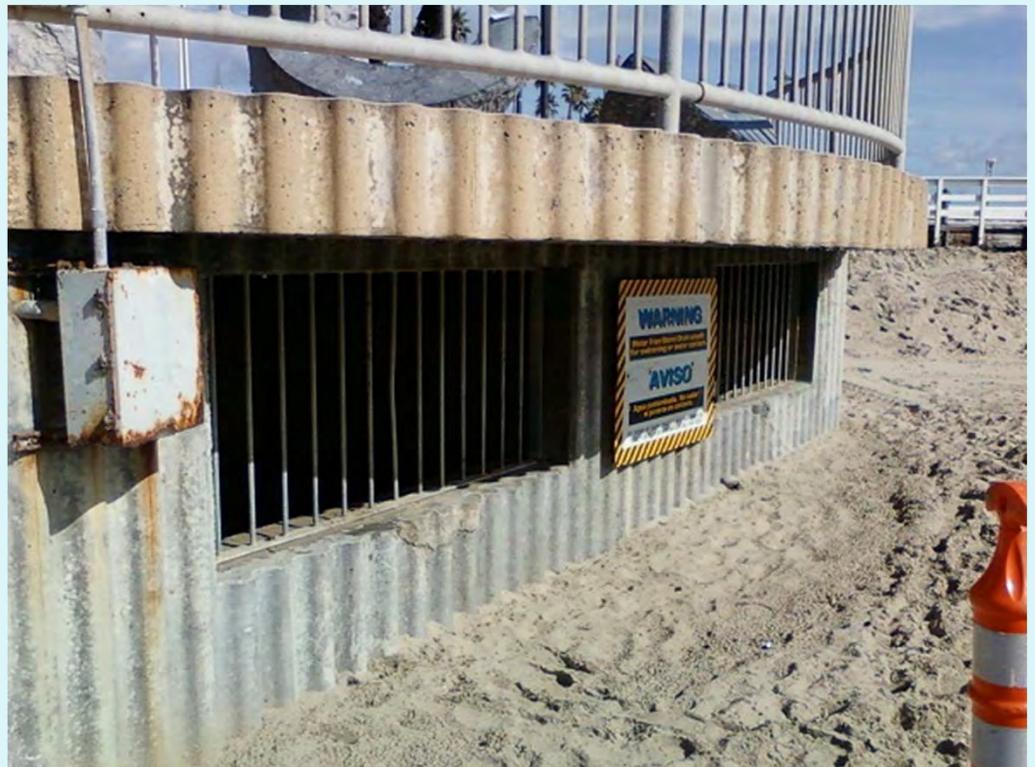


- Lot repaved as part of project
- Match \$40,000 from FY14 budget

Grants & Projects

State Clean Beaches Initiative Grant & CIP Project

- Neary Lagoon Storm Drain Improvement Project
- Goal: Reduce bacteria levels at Cowell Beach
- Storm drain pipes exit at Cowell Beach-buried under sand in summer



Neary Lagoon Beach Outlet Vault

Grants & Projects



Neary Lagoon

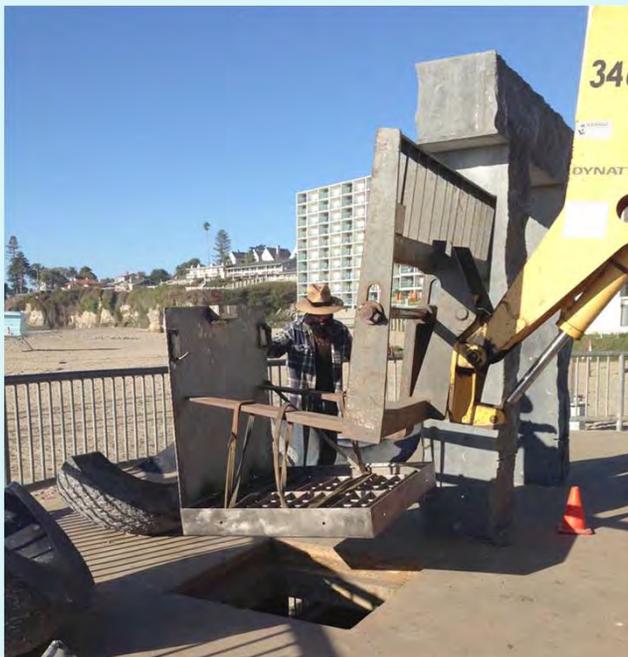
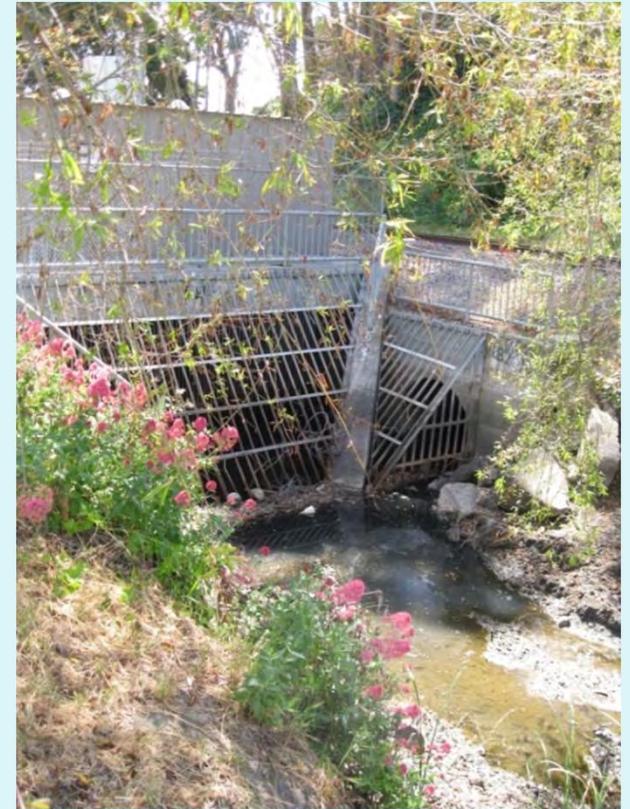
**Gates closed in Summer &
opened in Winter**



Installed Spring 2014

Grants & Projects

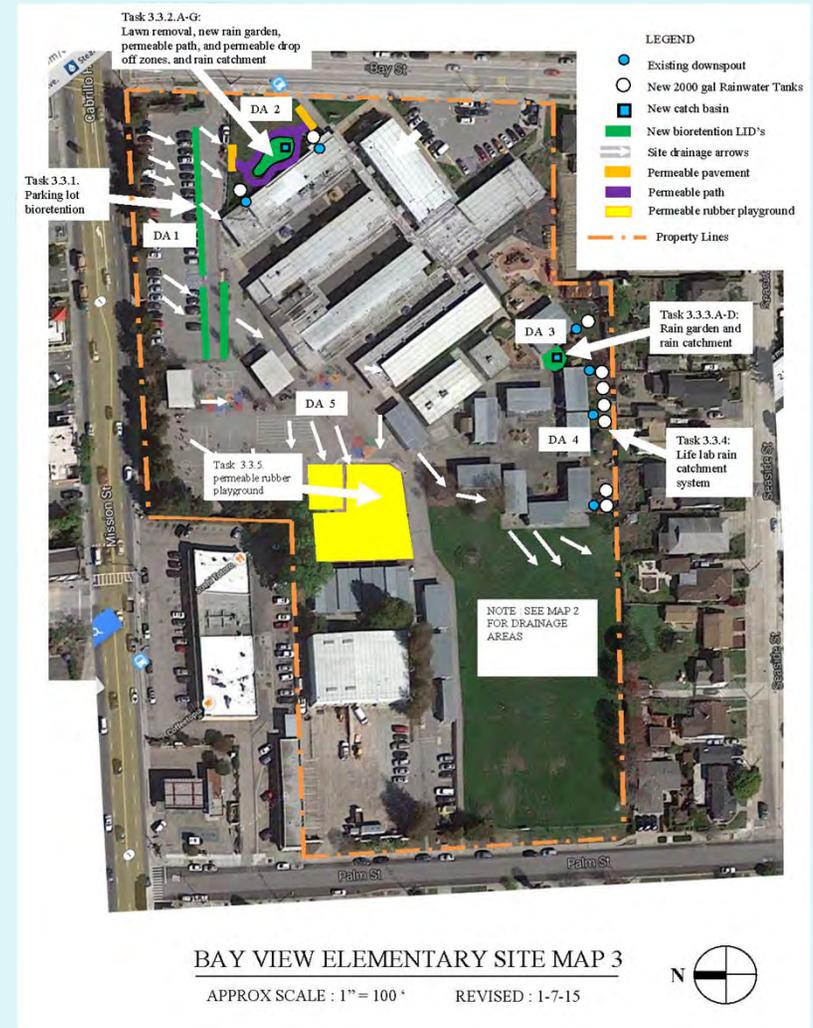
- New hatch at beach outlet vault
- Temp steel plate on gravity pipe opening at beach during summer
- Neary pump station & storm drain lines now cleaned late Spring & Fall



Grants & Projects

State DROPS Grant: Low Impact Design for Schools

- City partnered w/Santa Cruz City Schools and UCSC IDEASS
- \$486,000 Grant Awarded to SC City Schools for Bay View Elementary
- Retrofit LID project: Bio-swales, pervious playground, and rain water catchment/cisterns
- City cost \$15,000 (FY16) towards large rain garden and educational signage



The End



ATTACHMENT 71

News

Palo Alto proceeds with storm water management fee increase

By **JACQUELINE LEE** | jlee1@bayareanewsgroup.com |

PUBLISHED: August 30, 2016 at 2:48 pm | UPDATED: August 31, 2016 at 7:56 am

PALO ALTO — Money from a proposed increase in storm water management fees would be spent more on operating costs than capital improvements, Palo Alto City Council decided on Monday, reversing a decision made earlier this year.

The council previously approved a resolution calling for a monthly fee of \$13.65, up from \$13.03.

The breakdown of the increased bill was going to be \$6.62 as the base amount and \$7.03 for capital improvements. Now, the allocation is reversed so that \$7.48 is the base and \$6.17 is for improvements.

City staff told council members that initial calculations were off because they were based on fiscal year 2016, rather than 2017, and more money is needed for operating costs.

A public protest hearing on the rate hike is set for Oct. 24. Property owners can file written opposition to the fee increase until then. If a majority does so, then the council has to terminate the fee increase process.

If there is no majority opposition, then the city will conduct a mail ballot election on the fee increase between Jan. 11 and Feb. 28.

If approved, the new fees would go into effect June 1 and generate about \$6.9 million in revenue annually for the next 15 years.

In early 2015, the city identified about \$37 million worth of capital improvements that are needed.

Property owners currently pay about \$12.63 per month in storm drain bills.

Current fees will expire in June. If no action is taken to approve updated fees, then the rates will revert to \$4.25, an amount property owners approved in 2005, which city leaders say is not enough to maintain operations.

Email Jacqueline Lee at jlee1@bayareanewsgroup.com or call her at 650-391-1334; follow her at twitter.com/jleenews.

Jacqueline Lee Jacqueline Lee is a reporter covering Palo Alto for the Bay Area News Group. Lee is an LA native and alum of USC Annenberg.

 [Follow Jacqueline Lee @jleenews](https://twitter.com/jleenews)

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ATTACHMENT 72



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- [Environment](#)
- [Commercial Sewer Service Charge](#)
- [Residential Sewer Service Charge](#)

Contact Us

City of San José
 Revenue Management –
 Sewer Billing Unit

200 East Santa Clara Street
 4th Floor
 San José, CA 95113

Phone: (408) 535-7055

Storm Sewer Service Charge

Storm Sewer Service Charge Rate

The Storm Sewer Service Charge rate structure charges users of the storm sewerage system in San José based on the relative quality and quantity of stormwater runoff contributed by residential, commercial, institutional, and industrial properties. The rate structure apportions the costs of storm sewer service to properties in proportion to their relative contribution of flow and pollution to the storm sewer system.

Rates are computed to recover projected costs of the following:

- Stormwater pollution control and permit compliance
- Management, operation, maintenance, and rehabilitation of the storm sewer system
- Improvements to the storm sewer system
- Street sweeping
- Administrative services

Storm Sewer Service Charge rates are reviewed and adjusted annually, as cost and service demand levels change. The current rate structure for storm sewerage services described below became effective July 1, 2011, with San José City Council adoption of Resolution No. 75857 on June 14, 2011. The rates are structured for the estimated cost recovery requirements and the service demand levels of Fiscal Year 2011-12. View the current [residential rates](#) and [commercial rates](#).

For Fiscal Years 2013-14, 2014-15, and 2015-16, no rate increases were adopted. Rates maintain at the same level as Fiscal Year 2011-12.

If you have questions regarding rates for storm sewerage service, please call us at (408) 535-7055.

San José City Hall

200 E. Santa Clara St.
 San José, CA 95113
 408 535-3500 Main
 408 294-9337 TTY
[Directions](#)



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ATTACHMENT 73

Sewer and Storm Water Fees

The charts below provide information on Sewer Fees and Storm Water Fees in the City of Alameda.

SEWER SERVICE FEE, CITY OF ALAMEDA

	FY2016	FY2017	FY2018	FY2019	FY2020
		% Increase 3.0%	% Increase 3.0%	% Increase 3.0%	% Increase 3.0%
Single Family (\$/month)	\$23.93	\$24.65	\$25.39	\$26.15	\$26.93
Multi-Family (\$/month)	\$21.54	\$22.19	\$22.86	\$23.55	\$24.26
Commercial Fixed Charge (\$/month) (includes first 730 cubic feet)	\$21.54	\$22.19	\$22.86	\$23.55	\$24.26
Flow-Based Rate (\$ per Hundred cubic feet)	\$2.96	\$3.05	\$3.14	\$3.23	\$3.33

STORM WATER FEE, CITY OF ALAMEDA

The Fee is based on the amount of pollution that the City estimates enters the municipal storm water system as a result of the installation or maintenance of impervious surfaces.

2,000 square feet of impervious surface = 1 Impervious Surface Unit (ISU)

The Fee is calculated according to the following formula:

Number of Impervious Surface Units (ISU)

multiplied by

Fee per Equivalent Residential Unit (ERU)

	Storm Water Fee
<p>Typical Single Family Residential Parcel</p> <p>A typical residential parcel has 5,000 square feet of surface area. 40 percent, or 2,000 square feet, is comprised of impervious surface (1 ISU).</p>	<p>\$56.15</p> <p>(1 Equivalent Residential Unit fee)</p>
<p>Condominium (per unit)</p> <p>A typical condo unit has 600 square feet of impervious surface area (0.3 ISU).</p>	<p>\$16.85</p> <p>(0.3 x 1 ERU)</p>

Other parcels with Impervious Surfaces are subject to the Fee based upon stated formula Fee: Number of ISUs multiplied by Fee per ERU.

DECLARATION OF SERVICE BY EMAIL

I, the undersigned, declare as follows:

I am a resident of the County of Sacramento and I am over the age of 18 years, and not a party to the within action. My place of employment is 980 Ninth Street, Suite 300, Sacramento, California 95814.

On September 27, 2017, I served the:

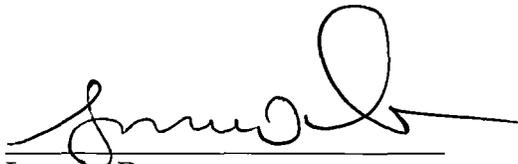
- **SWRCB and SDRWQCB Comments on the Test Claim filed September 22, 2017**

*California Regional Water Quality Control Board, San Diego Region,
Order No. R9-2010-0016, 11-TC-03*

County of Riverside, Riverside County Flood Control and Water Conservation District,
Cities of Murrieta, Temecula, and Wildomar, Co-Claimants

By making it available on the Commission's website and providing notice of how to locate it to the email addresses provided on the attached mailing list.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on September 27, 2017 at Sacramento, California.



Lorenzo Duran
Commission on State Mandates
980 Ninth Street, Suite 300
Sacramento, CA 95814
(916) 323-3562

COMMISSION ON STATE MANDATES

Mailing List

Last Updated: 9/21/17

Claim Number: 11-TC-03

Matter: California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016

Claimants: City of Murrieta
City of Temecula
City of Wildomar
County of Riverside
Riverside County Flood Control and Water Conservation District

TO ALL PARTIES, INTERESTED PARTIES, AND INTERESTED PERSONS:

Each commission mailing list is continuously updated as requests are received to include or remove any party or person on the mailing list. A current mailing list is provided with commission correspondence, and a copy of the current mailing list is available upon request at any time. Except as provided otherwise by commission rule, when a party or interested party files any written material with the commission concerning a claim, it shall simultaneously serve a copy of the written material on the parties and interested parties to the claim identified on the mailing list provided by the commission. (Cal. Code Regs., tit. 2, § 1181.3.)

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ATTACHMENT 74

MEASURE CW

The Clean Water, Clean Beach Parcel Tax

During the November 8, 2016 Special Municipal Election, Culver City residents voted on Measure CW, the Clean Water, Clean Beach Parcel Tax. The results are as follows: YES - 73.82%; NO - 26.18%.

Funds raised by Measure CW will be used for improvements in water quality in Ballona Creek, Marina del Rey, Santa Monica Bay, and the Pacific Ocean. Measure CW required approval by 2/3 of those voting on the measure to pass.

Need for Measure CW

Dangerous bacteria, pesticides, toxic chemicals, oil and grease, trash and other pollutants are deposited on our roadways and flow into Ballona Creek, Marina del Rey, and the ocean through our storm drains, by rain, and other runoff water. These pollutants harm fish and wildlife, cause illness and infections for swimmers and surfers, and make beaches unsafe and unsightly for families and visitors. The State and Regional Water Quality Control Boards have implemented very strict pollution reduction regulations for storm water runoff. These regulations require the City of Culver City to develop and implement programs to reduce and prevent water pollution.

Purpose of Measure CW

Measure CW establishes an annual Clean Water, Clean Beaches Parcel Tax in the City of Culver City.

Measure CW was placed on the ballot by the City Council of the City of Culver City to create a dedicated source of funding to pay for water quality programs that will prevent pollution from reaching our waterways, beaches and the Ballona Creek Estuary. Measure CW required approval by 2/3 of those voting on the measure.

Cost of Measure CW

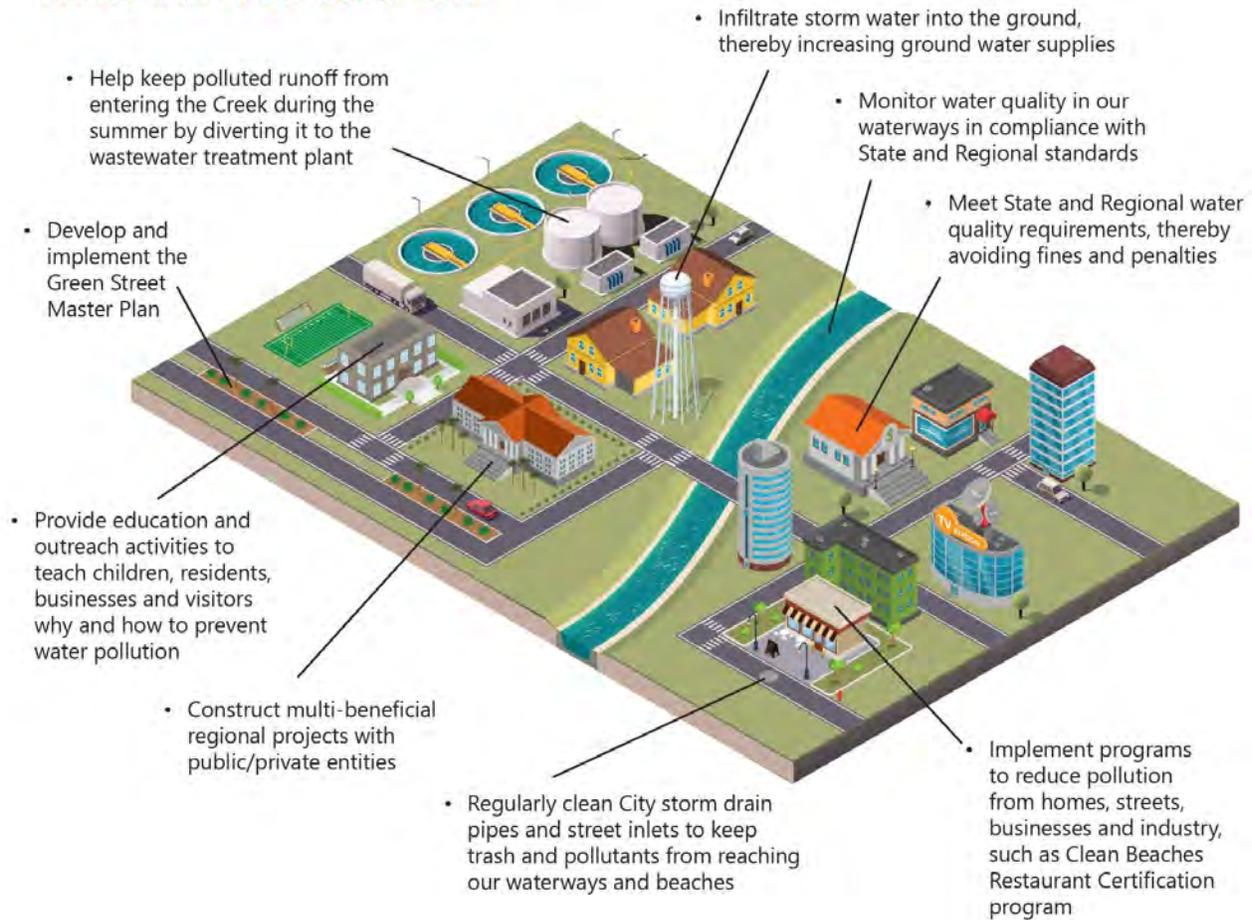
- \$99 annually per single family residential parcel
- \$69 annually per multi-family residential dwelling unit
- \$1,096 annually per acre of land or portion thereof for non-residential

Each parcel owner of a non-residential property will be taxed \$1,096 per acre of land (or portion thereof) annually. The \$1,096 will be pro-rated for non-residential parcels less than one acre. For example, a non-residential parcel of one-half acre will be taxed \$548. Land owners are taxed, not individual businesses located on the non-residential property. For larger parcels with multiple tenants, the land owner will receive one bill based on the size of the parcel, not the tenants.

Tax-exempt parcels will not be charged. Charges will first appear on the tax statements in fall 2017.

Measure CW is expected to generate about \$2 million per year. All Measure CW money will be used here in Culver City to reduce water pollution.

What will it be used for?



Use of Measure CW Funds

Measure CW funds will be placed in a special Clean Water, Clean Beaches Fund, and funds must be used exclusively for reducing and preventing water pollution and managing storm water and urban runoff. The Financial Advisory Committee will oversee how the funds are spent.

[What you need to know about Measure CW.](#)

[View the quick Fact Guide on Measure CW.](#)

Click below for important information on Measure CW

- [Full Ballot Measure Text](#)
- [Argument in Favor](#)
- [Impartial Analysis](#)

Click Below for the Enhanced Watershed Management Programs and Coordinated Integrated Monitoring Plans

Ballona Creek

Enhanced Watershed Management Program for the Ballona Creek Watershed

Coordinated Integrated Monitoring Program (CIMP) for the Ballona Creek Watershed

Marina Del Rey

Marina del Rey Enhanced Watershed Management Program Plan

Marina del Rey Coordinated Integrated Monitoring Program

City Contacts

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DECLARATION OF SERVICE BY EMAIL

I, the undersigned, declare as follows:

I am a resident of the County of Sacramento and I am over the age of 18 years, and not a party to the within action. My place of employment is 980 Ninth Street, Suite 300, Sacramento, California 95814.

On October 30, 2017, I served the:

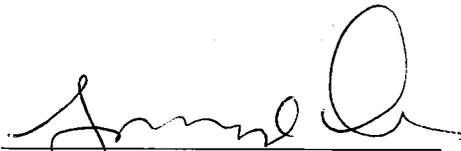
- **SWRCB and LARWQCB Late Comments on the Test Claim filed October 30, 2017**

California Regional Water Quality Control Board, Los Angeles Region, Order No. R4-2010-0108, 11-TC-01.

County of Ventura and Ventura County Watershed Protection District, Co-Claimants

By making it available on the Commission's website and providing notice of how to locate it to the email addresses provided on the attached mailing list.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on October 30, 2017 at Sacramento, California.



Lorenzo Duran
Commission on State Mandates
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COMMISSION ON STATE MANDATES

Mailing List

Last Updated: 9/21/17

Claim Number: 11-TC-01

Matter: California Regional Water Quality Control Board, Los Angeles Region, Order No. R4-2010-0108

Claimants: County of Ventura
Ventura County Watershed Protection District

TO ALL PARTIES, INTERESTED PARTIES, AND INTERESTED PERSONS:

Each commission mailing list is continuously updated as requests are received to include or remove any party or person on the mailing list. A current mailing list is provided with commission correspondence, and a copy of the current mailing list is available upon request at any time. Except as provided otherwise by commission rule, when a party or interested party files any written material with the commission concerning a claim, it shall simultaneously serve a copy of the written material on the parties and interested parties to the claim identified on the mailing list provided by the commission. (Cal. Code Regs., tit. 2, § 1181.3.)

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